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Recombination-line intensities for hydrogenic ions – I. Case B calculations for H I and He II

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Summary. The relative intensities of H I and He II recombination lines are calculated, including full collisional effects, for a considerably larger range of temperature, density and principal quantum numbers than before. Case B of Baker & Menzel is assumed, and tables of line opacities are also presented to enable the assumption of negligible optical depth in all but the Lyman series to be checked. Collisional excitation of the $n=3$ levels from both $n=1$ and $n=2$ states is considered, and is found to invalidate Case B theory in some conditions which depend on electron density and the Lyman-α escape probability. The regimes of temperature and particle density for which Case B is valid are discussed. Newly calculated collision strengths for the $n=1$, 2 and 3 states of He^+ are tabulated.

1 Introduction

With the increasing sensitivity and resolution available to infrared spectroscopy, recombination lines can be observed in many types of astronomical objects at ever-increasing wavelengths. In order to interpret these observations, which can be uniquely useful because of the relative simplicity of the physical process controlling the formation of infrared recombination lines, it is necessary to have theoretical line intensities for transitions involving levels with quantum numbers larger than previously considered. Moreover, in many of these objects, such as Wolf–Rayet stars, for which accurate infrared line measures can be obtained, the relevant temperatures and densities lie outside the ranges covered by existing tabulations. For the higher densities, particularly, collisional effects are very much more important than in previous recombination calculations and therefore have to be treated more accurately and completely. In view of the higher densities considered here, we limit our calculations to Case B of Baker & Menzel (1938) for which the Lyman lines are taken to be optically thick. In the Case B

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approximation, it is assumed that all other lines are optically thin. Since this assumption may be invalid at the higher densities, we tabulate a factor for every transition from which the line opacity can be easily calculated.

In a standard Case B calculation, the effect of collisional excitations from $n=1$ and $n=2$ states is ignored. The range of densities of interest for Wolf–Rayet stars includes a regime in which collisional excitation from the $n=2$ states may become important. In this paper we restrict ourselves to densities for which the standard Case B assumptions are valid. A subsequent paper will give the results of extended Case B calculations at the higher densities.

The recombination of a high-density plasma has been treated previously by a number of authors. The connection between the so-called collisional-radiative recombination theory of Bates, Kingston & McWhirter (1962) and the approach used by Brocklehurst (1970, 1971) and by ourselves is shown by Burgess & Summers (1976) and Summers (1977). Our Case B theory is identical to the 'depopulated $n=2$' case treated by Summers (1977), apart from our choice of collisional cross-sections and method of solution. As discussed below, our numerical results are essentially identical to those of Summers (1977) in the few cases where comparison can be made, although the goals of his paper are very different from ours.

In this paper we give extensive results for the recombination lines of H I and He II, with the upper and lower principal quantum numbers up to 50 and 29, respectively. For H I we cover the temperature and density ranges $3\leq\log T_e\leq4.5$ and $2\leq\log N_e\leq10$, while for He II, $3.5\leq\log T_e\leq5$ and $2\leq\log N_e\leq13$. Our results are largely an extension of those of Brocklehurst (1971). In Section 2 we give a brief description of the method of calculation and outline the most important differences from the work of Brocklehurst. Section 3 contains a detailed comparison of the rates for the various atomic processes and of the numerical methods with those used by Brocklehurst. In Section 4, we discuss the breakdown of Case B theory caused by collisional transitions from levels with $n=1$ and $n=2$ to higher levels, and derive conditions parameterized by the Lyman alpha escape probability under which these effects can be neglected. The resulting relative intensities and opacity factors, which are tabulated in full on microfiche, are discussed in Section 5.

2 Formulation

In the determination of the level populations, N_{nl}, of hydrogenic systems, we follow the approach of Brocklehurst (1970, 1971), and make use of the computer program used in the latter work with a number of modifications and improvements. It is convenient to introduce the departure coefficients b_{nl} defined in terms of the Saha–Boltzmann populations by

$$\frac{N_{nl}}{N_eN_+}=\frac{\omega_{nl}}{2\omega_+}\left(\frac{h^2}{2\pi mkT_e}\right)^{3/2}\exp(x_{nl})\,b_{nl}, \tag{1}$$

where N_e and N_+ are the densities of electrons and recombining ions, respectively, $x_{nl}=E_{nl}/kT_e$, and E_{nl} is the ionization energy of the state. To calculate b_{nl} we use a two-stage process. In the first stage, values of b_n are calculated assuming that the l-sublevels have populations proportional to $(2l+1)$, so that $b_{nl}=b_n$. A matrix condensation method is used to reduce the infinite set of linear equations describing the departure coefficients b_n to a finite set. The calculation of the b_n is carried out using a program that has been described by Storey (1972) and by Seaton & Storey (1976). This program differs from that used by Brocklehurst (1970) mainly in the treatment of energy-changing collisional processes and in its generality with respect to the charge of the hydrogenic ion. In the second stage of the calculation, the values of b_n from the first stage are used to start an iterative solution for the b_{nl}. Brocklehurst (1971) defined a value of

$n=n_c$ above which it is assumed that $b_{nl}=b_n$. For $n\leq n_c$, values of b_{nl} at each n are calculated by solving the n linear equations describing the populations of the nl substates, making explicit allowance for the $l\rightarrow l\pm1$ collision processes. The iteration begins with $n=n_c$ and ends with $n=3$ for a Case B calculation. A few such iterations are normally sufficient for adequate convergence. The value of $n=n_c$ necessary to ensure $b_{nl}=b_n$ depends on ion charge, particle density and electron temperature; our method of determining n_c is discussed below. In the second stage calculation, the main differences from Brocklehurst (1971) are again in the treatment of energy-changing collisional processes. There are also some differences in the numerical methods used to evaluate the infinite sums of radiative rates. In the calculation of b_n, Brocklehurst incorporated all energy-changing collision processes, whereas in the calculation of b_{nl}, only those transitions were included in which the principal quantum number changed by ±1. Although transitions with $|\Delta n|=1$ dominate in the total rate for energy-changing collisions, this inconsistency in the treatment of collisions in the two stages of the calculation led to difficulties in matching the values of b_{nl} and b_n at $n=n_c$ (Brocklehurst 1971). These difficulties become worse at densities larger than those considered by Brocklehurst. In the calculations described here, all electron-induced energy-changing collisional processes are incorporated, both in the calculation of b_n and the subsequent calculation of b_{nl}. In addition, the same cross-sections and the same numerical methods are used in both stages.

3 Atomic rate coefficients and numerical methods

3.1 CALCULATION OF b_n

We describe the atomic processes included in the calculation of b_n and compare our methods with those of Brocklehurst (1970):

3.1.1 Bound–bound radiative transitions

As in Brocklehurst (1970).

3.1.2 Radiative recombination

As in Brocklehurst (1970).

3.1.3 Bound–bound collisional transitions

Brocklehurst (1970) used a mixture of impact-parameter, correspondence principle, and binary encounter cross-sections for these transitions. Here, the fits to various classical and semi-classical results of Percival & Richards (1978) are used. A more complete background to these cross-sections is given by Percival & Richards (1975).

3.1.4 Collisional ionization and three-body recombination

We use the symmetrized binary encounter ionization cross-section of Burgess & Percival (1968, equation 37). Burgess & Summers (1976) have added a contribution allowing for distant collisions, calculated in the impact-parameter approximation (Burgess 1964; Summers 1979). Using the formulae of Summers (1979), we find that the maximum contribution to the collision rate from this logarithmic, quantal part of the cross-sections is 4 per cent for the $n=3$ state of He^+ at 100 000 K. The quantal contribution declines rapidly as n increases and electron temperature

decreases. We therefore neglect this term in the cross-section. Binary-encounter ionization cross-sections are also discussed by Percival & Richards (1975), who introduce a modification to the binary encounter result for H at low energies. We exclude this modification since it is only of importance at energies, and for states, for which collisional ionization is an unimportant process in the conditions considered here. Brocklehurst (1970) does not specify how he calculated the rates for these processes, but it seems likely that he also used a binary encounter method, which is suitable for large energy transfers. Rate coefficients for three-body recombination are obtained from those for collisional ionization using the principle of detailed balance.

3.1.5 *Numerical methods*

We employ the matrix condensation technique first applied to this problem by Burgess & Summers (1969). A description of the method is given by Brocklehurst (1970) and by Burgess & Summers (1976).

In summary, our calculations of b_n and those of Brocklehurst (1970) differ only in the choice of cross-sections for energy-changing collisional processes.

3.2 CALCULATION OF b_{nl}

3.2.1 *Bound–bound radiative transitions*

Brocklehurst (1971) evaluates transition probabilities directly from the expression of Gordon (1929) in terms of the hypergeometric functions ${}_2F_1$. He calculates these functions directly from series expansions. We use the same method for low principal quantum numbers ($n \leq 200$), but for higher values, which are required in our modified treatment of the cascade problem, we use recursion relations to generate the functions in order to avoid cancellation difficulties (see for example, van Regemorter *et al.* 1979).

3.2.2 *Radiative recombination*

As in Brocklehurst (1971).

3.2.3 *l-changing collisions*

As in Brocklehurst (1971), we use the semi-classical impact-parameter treatment for degenerate states developed by Pengelly & Seaton (1964). In this approach, a weak and a strong coupling region of incident particle impact parameter, r_p, are defined. The boundary of these two regions, $r_p = r_s$, is defined by

$$\sum_{l'=l\pm1} P_{nl,nl'} = \tfrac{1}{2}, \tag{2}$$

where $P_{nl,nl'}(E, r_p)$ is the probability of a transition from $nl \rightarrow nl'$ at an incident energy E, and impact parameter r_p. The cross-section for collisions out of nl is then given by

$$Q_{nl} = \sum_{l'=l\pm1} Q_{nl,nl'} = \int_{r_s}^{r_u} 2\pi r \sum_{l'=l\pm1} P_{nl,nl'}\, dr + \tfrac{1}{2}\pi r_s^2, \tag{3}$$

where it has been assumed that in the strong coupling region the average probability of a transition is 1/2, and r_u is an upper cut-off, discussed by Brocklehurst (1971). The probability $P_{nl,nl'}$ is directly proportional to the oscillator strength of the transition, $f_{nl,nl'}$. In Brocklehurst's

approach, rate coefficients C_{nl} are calculated by integrating the Q_{nl} over a Maxwellian distribution of electron velocities. Individual rate coefficients $C_{nl,nl'}$ are then obtained by recursion and detailed balancing arguments, starting both at $l=0$ and at $l=n-1$. Different values of $C_{nl,nl'}$ are obtained from these two recursions, and a mean is taken. This procedure leads to oscillations in the behaviour of $C_{nl,nl'}$ as a function of l of a few per cent. We avoid these oscillations by making the additional assumption that even in the strong coupling region, the cross-section is proportional to the oscillator strength, so that for all impact parameters,

$$\frac{Q_{nl,nl'}}{Q_{nl}}=\frac{f_{nl,nl'}}{\Sigma_{l'=l\pm1}f_{nl,nl'}}. \tag{4}$$

The $C_{nl,nl'}$ obtained with this assumption differ by at most a few per cent from those obtained by Brocklehurst's method, but vary smoothly with l. In practice, $C_{nl,nl+1}$ is calculated and $C_{nl+1,nl}$ is obtained from detailed balance considerations. In the calculation of the rate coefficients for these collisions we have included the effects of electrons, protons and He^+ ions. The assumed abundances are discussed in Section 4.

3.2.4 Energy-changing collisions

We use the cross-sections described in Section 3.1.3 above. As the collision rates for $\Delta l=l'-l=\pm1$ dominate, we consider only those transitions. Because the collision rates among the nearly degenerate l-states for a given value of n are always much larger than for n-changing collisions, the precise l-dependence of the $nl\rightarrow n'l\pm1$ cross-sections is not of primary importance. Moreover, the dominant contribution comes from transitions with $|\Delta n|=1$. Consequently, for transitions with $|\Delta n|=1$ we have assumed that the excitation cross-section, Q, at incident energy E is

$$\begin{aligned} Q_{nl,n\pm1l'}(E) &= \frac{f_{nl,n\pm1l\pm1}}{f_{n,n\pm1}}Q_{n,n\pm1}(E), \qquad \Delta l=\pm1 \\ &= 0, \qquad\qquad\qquad\qquad \Delta l\neq1 \end{aligned} \tag{5}$$

where f stands for absorption oscillator strength. This assumption is based on the Coulomb–Bethe approximation for collisional excitation. For transitions with $|\Delta n|>1$ we use the simpler approximation,

$$\begin{aligned} Q_{nl,n'l+\Delta l}(E) &= Q_{nn'}(E), \qquad \Delta l=\pm1 \\ &= 0, \qquad\qquad \Delta l\neq\pm1. \end{aligned} \tag{6}$$

These assumptions maintain the correct total number of $n\rightarrow n'$ transitions, and rely on the very rapid l-changing collisions with $\Delta n=0$ to correctly distribute population among the l-substates for each n. In order for this to occur, the rate of l-changing collisions for a given n must exceed the largest radiative decay rate for that value of n. Calculations show this to be true for those values of n for which n-changing collisions are important. Calculations were also made with the cruder approximation of equation (6) for all values of $|\Delta n|$. The resulting values of b_{nl} differ by no more than 0.2 per cent from the final values obtained using equation (5) for the $|\Delta n|=1$ transitions. This is an additional confirmation that the exact l-dependence of the $n\rightarrow n'$ collision rates is not important. To summarize, Brocklehurst (1971) included only $|\Delta n|=1$ transitions, which were calculated by the impact-parameter method. We employ the cross-sections of Percival & Richards (1978) with the assumptions of equations (5) and (6) and with no restriction on $|\Delta n|$.

3.2.5 Collisional ionization and three-body recombination

As in equation (6) we assume that the ionization cross-section at incident electron energy E, is independent of the angular momentum of the bound level,

$$\sigma_{nl}(E)=\sigma_n(E). \tag{7}$$

For $\sigma(E)$ we use the binary encounter result of Burgess & Percival (1968). The three-body recombination rate is obtained as in Section 3.1.4.

3.2.6 Numerical methods

As outlined in Section 2, the iterative method of evaluation of b_{nl} is similar to that used by Brocklehurst (1971). The differences lie in the treatment of the radiative cascade and collisional contributions to the populations of each sublevel nl. In Brocklehurst's treatment it was assumed that $b_{nl}=b_n$ for $n_c<n\leq 300$. For higher n he assumed $b_n=1$. In our calculation, $b_{nl}=b_n$ for all $n>n_c$. To obtain the total radiative cascade rate to a given level, nl, Brocklehurst sums the first few terms and then makes a two-term fit to the quantity $n'^3A(n'l'\rightarrow nl)\,b_{n'l'}$ where A is the transition probability from some higher state $n'l'$ to nl. This quantity is slowly varying as a function of $1/n'^2$. The fit is then integrated analytically. We replace this latter procedure with five-point Gaussian integration in the variable $1/n'^2$. These changes do not represent a great improvement in accuracy over Brocklehurst's approach, but arise from our desire to use, as far as is possible, the same techniques in the first-stage calculation of b_n as in the subsequent calculation of b_{nl}. The infinite sums of collisional rates are obtained in a similar way, by summing the first few terms and carrying out a numerical integration for the remainder. In this case a 16-point Gaussian integration in the variable $1/n'^2$ is used. Again the same method is used in both stages of the calculation.

4 Collisional excitation of higher levels from $n=1$ and $n=2$

The 'Case B' theory used here is based on the assumption that the level populations for $n\geq 3$ are independent of those of levels 1 and 2, which are not, of course, evaluated explicitly. However, at the higher densities and temperatures considered in this paper it is possible that upward collisional transitions from $n=1$ and 2 may make an appreciable contribution to the populations with $n\geq 3$ and thus invalidate these calculations. Thus it is imperative both that explicit conditions be derived under which these collisional transitions are negligible and that the users of our tables take these limits seriously.

The rate at which an (n, l) level is populated by direct recombination and by radiative and collisional transitions from all levels with larger principal quantum numbers is given in terms of an effective recombination rate constant $\bar{\alpha}_{nl}$, which is defined by

$$N_eN_+\bar{\alpha}_{nl}=N_eN_+(\alpha_{nl}+N_e\beta_{nl})+\sum_{n'=n+1}^{\infty}\sum_{l'=l\pm 1}N_{n'l'}(A_{n'l',nl}+N_eC_{n'l',nl}), \tag{8}$$

where α_{nl} and β_{nl} are the direct radiative and three-body recombination rate coefficients, $A_{n'l',nl}$ is the Einstein coefficient and $C_{n'l',nl}$ is the collisional rate coefficient for the $(n', l')\rightarrow(n, l)$ transition. From Tables 1 and 2, which give values of $\bar{\alpha}_{nl}$ for $n=2$ and 3 in hydrogen and ionized helium, respectively, at selected values of N_e and T_e, it is clear that these coefficients are smoothly decreasing functions of temperature and are almost independent of density. Rate coefficients for electron-induced transitions between levels with $n=1$, 2 and 3 are required for both H and He^+. We discuss these rate coefficients in the Appendix. The Appendix contains the

Table 1. Values of $10^{14}\bar{\alpha}_{n,l}$ for hydrogen.

10^{-4} T_e	log N_e	2s	2p	3s	3p	3d
0.1	6	48.1	133.	8.07	23.7	62.7
	8	79.6	192.	13.0	38.9	76.9
	10	184.	598.	34.5	118.	205.
0.3	6	20.5	50.5	3.53	9.77	21.6
	8	24.9	57.0	4.18	11.9	21.7
	10	30.9	94.7	5.75	19.2	31.6
0.5	6	14.2	32.5	2.49	6.61	1.30
	8	15.9	34.9	2.72	7.45	12.7
	10	16.8	49.2	3.13	10.1	16.0
0.75	6	10.6	22.8	1.90	4.82	8.50
	8	11.4	23.9	1.98	5.21	8.30
	10	11.0	30.8	2.06	6.45	9.76
1.0	6	8.57	17.6	1.56	3.84	6.24
	8	9.01	18.2	1.60	4.05	6.10
	10	8.35	22.5	1.57	4.77	6.95
1.5	6	6.34	12.2	1.18	2.75	3.96
	8	6.50	12.4	1.18	2.84	3.90
	10	5.79	14.6	1.10	3.16	4.34
2.0	6	5.08	9.27	0.964	2.15	2.84
	8	5.15	9.42	0.953	2.19	2.82
	10	4.51	10.8	0.862	2.37	3.11
3.0	6	3.69	6.25	0.717	1.49	1.75
	8	3.69	6.32	0.702	1.50	1.75
	10	3.20	7.05	0.620	1.58	1.94

Table 2. Values of $10^{13}\bar{\alpha}_{n,l}$ for He^+.

10^{-4} T_e	log N_e	2s	2p	3s	3p	3d
1.0	8	4.69	11.8	0.804	2.25	5.15
	10	5.96	13.8	0.992	2.86	5.32
	12	8.17	25.5	1.52	5.13	8.60
1.25	8	3.98	9.75	0.688	1.90	4.14
	10	4.84	11.0	0.810	2.30	4.18
	12	6.00	18.5	1.12	3.73	6.16
1.5	8	3.49	8.34	0.607	1.65	3.46
	10	4.10	9.20	0.692	1.94	3.44
	12	4.75	14.4	0.887	2.93	4.77
2.0	8	2.83	6.51	0.499	1.32	2.59
	10	3.20	6.99	0.546	1.49	2.54
	12	3.38	10.0	0.633	2.06	3.26
3.0	8	2.12	4.56	0.380	0.965	1.70
	10	2.28	4.77	0.397	1.04	1.66
	12	2.20	6.23	0.414	1.30	1.97
5.0	8	1.45	2.88	0.268	0.640	0.973
	10	1.51	2.96	0.270	0.667	0.956
	12	1.35	3.57	0.257	0.762	1.08
10.0	8	0.853	1.50	0.164	0.353	0.435
	10	0.858	1.51	0.161	0.356	0.435
	12	0.738	1.72	0.144	0.379	0.481

results of a new close-coupling and distorted-wave calculation of collision strengths for $He^+ + e$, which provides rates for the $1 \rightarrow 3$ and $2 \rightarrow 3$ transitions substantially more accurate than those currently in the literature.

4.1 1→2 AND 1→3 COLLISIONAL TRANSITIONS

The ground-state population is determined by the balance of ionizing and recombining mechanisms, and consequently its value in any particular circumstance cannot be obtained from recombination theory alone. However, we can derive a limiting value for the degree of ionization which ensures that collisional transitions from the ground state are negligible. The population of level (n, l) will be unaffected by collisions from $n=1$ if

$$N_{1s}N_e C_{1s,nl} \ll N_e N_+ \bar{\alpha}_{nl}. \tag{9}$$

We define a critical degree of ionization $(N_{1s}/N_+)^{\rm crit}_{nl}$, such that the total rate of collisional population of the (n, l) level is a small fraction, p, of the population rate from higher states, by

$$(N_{1s}/N_+)^{\rm crit}_{nl} \equiv p\bar{\alpha}_{nl}/C_{1s,nl}. \tag{10}$$

As this quantity depends strongly on temperature, but less strongly on density, we give in Table 3 for $p=0.1$ values of $(N_{1s}/N_+)^{\rm crit}_{nl}$ for one density only, $N_0=10^6$ for H and $N_e=10^8$ for He^+. If, in a particular situation, collisional excitation of $n=2$ is important, but not that of higher levels, then the tabulated Case B results will still be valid providing collisional $2 \rightarrow 3$ transitions are negligible; this issue is discussed in the next Section 4.2. On the other hand, if collisional excitation of $n=3$ from the ground state is significant, then $1s \rightarrow nl$ collisions are probably contaminating level populations for all levels, and the results of this paper are simply inapplicable.

Table 3. Critical values of $N(1s)/N_+$ such that $1s \rightarrow nl$ collisional excitation is 10 per cent of the total population rate for H and He^+.

H I ($N_e=10^6\,cm^{-3}$)

$10^{-4}T_e$	2s	2p	3s	3p	3d
1.0	1.1−1	1.3−1	5.4−1	7.3−1	2.5
1.5	1.7−3	1.8−3	5.0−3	5.6−3	1.5−2
2.0	2.1−4	1.9−4	5.0−4	4.6−4	1.1−3
3.0	2.4−5	1.8−5	3.8−5	2.7−5	6.2−5

He II ($N_e=10^8\,cm^{-3}$)

$10^{-4}T_e$	2s	2p	3s	3p	3d
3.0	4.9+1	4.2+1	3.8+2	5.1+2	1.8+3
5.0	7.6−2	5.4−2	1.8−1	2.0−1	7.6−1
10.0	5.5−4	2.8−4	5.6−4	4.7−4	1.9−3

4.2 2→3 COLLISIONAL TRANSITIONS

As distinct from the situation for the ground state, the level populations of 2s and 2p levels can be determined from Case B theory by a simple extension, at least if collisional $1 \rightarrow 2$ transitions are negligible. The statistical equilibrium equations for the 2s and 2p levels, respectively, can be written as

$$N_+\bar{\alpha}_{2s} + N_{2p}C_{2p,2s} + N_{1s}C_{1s,2s} = N_{2s}[A_{2q}N_e^{-1} + C_{2s,1s} + C_{2s,2p} + C(2s)] \tag{11}$$

$$N_+\bar{\alpha}_{2p}+N_{2s}C_{2s,2p}+N_{1s}(C_{1s,2p}+N_e^{-1}\bar{J}B_{1s,2p})$$
$$=N_{2p}[N_e^{-1}(A_{2p,1s}+\bar{J}B_{2p,1s})+C_{2p,1s}+C_{2p,2s}+C(2p)]. \quad (12)$$

Here we have defined

$$\bar{J}\equiv\int d\nu\,\phi_\nu J_\nu \quad (13)$$

and

$$C(2l)\equiv\sum_{n'>2}\sum_{l'}C_{2l,n'l'};$$

A_{2q} is the two-quantum decay rate for which Nussbaumer & Schmutz (1984) obtain $A_{2q}=8.2249\,Z^6(R_Z/R_H)$, and ϕ_ν is the normalized line absorption coefficient for Lyman α.

The $n=2$ level populations depend on the mean Lyman-α radiation field $\bar{J}$, which is generally unknown. However, in many cases we can obviate this situation by eliminating $\bar{J}$ through the introduction of the probability β per scattering that a photon is *not* rescattered in the line. This quantity is usually referred to as the 'single-flight' escape probability, which for high-velocity gas flows is given by expressions due to Sobolev (1957) and Castor (1970). The theory of escape probabilities for a general flow field is discussed by Hummer & Rybicki (1982) and Rybicki & Hummer (1983), and the important case of resonance lines scattering with partial redistribution is treated by Basko (1978). If the line photons are lost as well to extinction by dust or in photoionizing other species, then β is the total *loss* probability discussed by Hummer & Rybicki (1985).

The value of this parameterization is that β can be roughly estimated without too much trouble; moreover if β is much larger or smaller than a certain critical value $\beta_c(N_e)$ which will be derived below, the results take certain simple limiting forms independent of the precise value of β. The parameterization is effected by the relation

$$(N_{1s}B_{1s,2p}-N_{2p}B_{2p,1s})\,\bar{J}=N_{2p}A_{2p,1s}(1-\beta),\qquad 0\le\beta\le1, \quad (14)$$

which, when substituted into equation (12) gives

$$N_+\bar{\alpha}_{2p}+N_{2s}C_{2s,2p}+N_{1s}C_{1s,2p}=N_{2p}[N_e^{-1}A_{2p,1s}\beta+C_{2p,1s}+C_{2p,2s}+C(2p)]. \quad (12')$$

Defining

$$R_s\equiv N_e^{-1}A_{2q}+C_s,\qquad C_s\equiv C_{2s,1s}+C(2s), \quad (15a)$$

$$R_p\equiv N_e^{-1}A_{2p,1s}\beta+C_p,\qquad C_p\equiv C_{2p,1s}+C(2p), \quad (15b)$$

$$C\equiv C_{2p,2s}=\tfrac{1}{3}C_{2s,2p}, \quad (15c)$$

we can solve equations (11) and (12′) to obtain

$$N_{2p}=\{N_+[\bar{\alpha}_{2p}(R_s+3C)+3C\bar{\alpha}_{2s}]+N_{1s}C_{1s,2p}(R_s+C)\}\,D^{-1} \quad (16a)$$

and

$$N_{2s}=\{N_+[\bar{\alpha}_{2p}C+\bar{\alpha}_{2s}(R_p+C)]+N_{1s}C_{1s,2s}(R_p+C)\}\,D^{-1}, \quad (16b)$$

where

$$D=R_pR_s+C(R_s+3R_p). \quad (16c)$$

The $2s$ and $2p$ level populations are largest for a given electron density when the terms in D that involve β become sufficiently small; this occurs for β less than some critical value

$\beta_c(N_e)$. Substituting equations (15a, b) into equation (16c) and collecting terms proportional to β, we find

$$\beta_c = N_e[R_s(C+C_p)+3CC_p]/[A_{2p,1s}(R_s+3C)]. \quad (17)$$

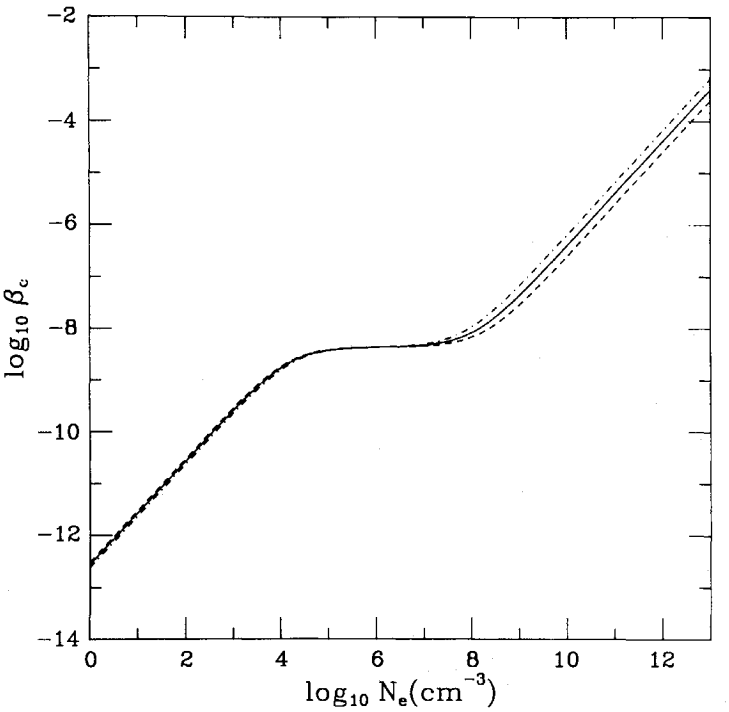

Figure 1. Log$\beta_c(N_e)$ as defined by equation (17) for H: T_e=5000 K (----), T_e=10 000 K (——), T_e=20 000 K (–·–·–).

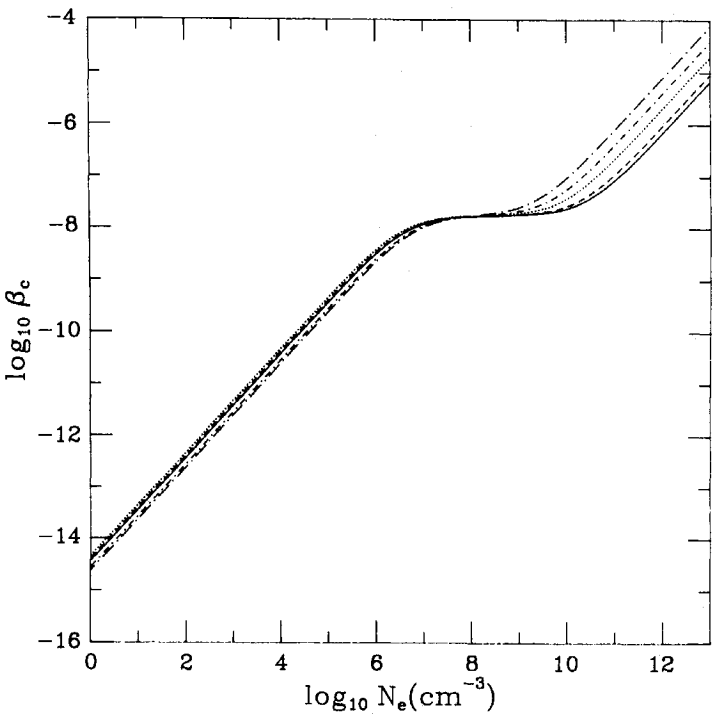

Figure 2. Log$\beta_c(N_e)$ for He+: T_e=1000 K (····), T_e=5000 K (----), T_e=10 000 K (——), T_e=50 000 K (–·–·–), T_e=100 000 K (—·—·—).

For H and He^+, this quantity is plotted *versus* N_e in Figs 1 and 2 for various temperatures; except at the highest densities it is not strongly temperature-dependent. Simple approximate forms of β_c for each of the distinct density regions apparent in the figures can readily be found from equation (17). Together with the sufficient conditions for their validity, these results, for regions (1), (2) and (3) in order of increasing density, are

$$\beta_c^{(1)}=N_e C/A_{2p,1s}, \qquad A_{2q}\gg 3N_e C\gg N_e \max(C_s, C_p) \tag{18a}$$

$$\beta_c^{(2)}=A_{2q}/3A_{2p,1s}, \qquad 3N_e C\gg A_{2q}\gg N_e \max(C_s, c_p) \tag{18b}$$

$$\beta_c^{(3)}=N_e(3C_p+C_s)/3A_{2p,1s}, \qquad 3N_e C\gg N_e \max(C_s, C_p)\gg A_{2q}. \tag{18c}$$

For $\beta_c^{(2)}$ we have the exact value $4.4\times10^{-9}Z^2$ and for $\beta_c^{(1)}$, an order of magnitude estimate of $2\times10^{-13}N_e Z^{-4}$. In regions (1) and (2) the dominant mechanism for depopulating the $2p$ level is collisional transitions to $2s$ followed by two-quantum decay, while in region (3), it is collisions to higher levels.

The denominator D in equations (16) can be written in the form

$$D=[R_s(C+C_p)+3CC_p][1+(\beta/\beta_c)]. \tag{19}$$

The only other occurrence of β in equations (16) is in the combination R_p+C, which can be written as

$$R_p+C=C\{1+(\beta/\beta_c)[R_s/(R_s+C)]\}+C_p[1+(\beta/\beta_c)]. \tag{20}$$

Thus the populations of the $n=2$ levels are manifestly independent of β when $\beta\ll\beta_c$; thus one can set $\beta=0$ which is the condition for strict radiative detailed balance in Lyman α. For $N_e\gtrsim10^8$ we see that β_c is sufficiently large for the $\beta=0$ limit to be attained in real astrophysical systems. In contrast, for lower densities the $\beta=1$ limit is probably appropriate, as the condition $\beta\ll\beta_c$ is likely never to be satisfied in reality in this case. This situation is in marked contrast to that for the higher Lyman lines for which the dominant loss mechanism is emission in other lines. The probability of re-emission into a line of another series is approximately 0.04, 0.16 and 0.18 for $n=3$, 4 and 5, respectively. Hence Case B is relatively easy to achieve for the higher Lyman lines, but not for Lyman α.

For $2\rightarrow3$ collisions to be negligible, we require

$$N_{2s}C_{2s,3l}+N_{2p}C_{2p,3l}\ll N_+\bar{\alpha}_{3l}, \qquad l=0,1,2. \tag{21}$$

Let us first assume that the terms in equations (16) containing N_{1s} are negligible, according to the criteria of the previous section. We now define a critical electron density N_e^c for the $n=3$ levels such that the total rate of collisional population of the $n=3$ states from $n=2$ is a small fraction, p, of the population rate from all higher states. That is

$$N_e^c\sum_{ll'}N_{2l}C_{2l,3l'}=pN_e^cN_+\sum_l\bar{\alpha}_{3l}, \tag{22}$$

where N_{2l} depends parametrically on N_e^c. In general equation (22) is quadratic in N_e^c, although it becomes linear for $\beta=0$. To avoid unnecessary algebraic complexity, we restrict our attention to regions (2) and (3), for which the condition $3N_eC\leqslant A_{2q}$ is valid. if, in addition

$$\beta\ll3N_eC/A_{2p,1s}\simeq5\times10^{-13}N_eZ^{-4}, \tag{23}$$

then equations (16) take the form

$$N_{2l}=(2l+1)N_eN_+\bar{\alpha}_2/(A_{2q}+3A_{2p,1s}\beta+\gamma N_e), \tag{24}$$

where

$$\bar{\alpha}_n = \sum_l \bar{\alpha}_{nl} \tag{25}$$

and

$$\gamma = C_{2s1s} + 3C_{2p1s}. \tag{26}$$

Combining equations (22)–(26), we have

$$N_e^c = \frac{p(A_{2q} + 3A_{2p,1s}\beta)}{\eta - p\gamma}, \tag{27}$$

where

$$\eta = \frac{\bar{\alpha}_2}{\bar{\alpha}_3} \sum_{ll'} (2l+1)\, C_{2l,3l'}. \tag{28}$$

The quantity $\bar{\alpha}_2/\bar{\alpha}_3$ is only weakly dependent on temperature and density. Values of N_e^c for H and He^+, with $\beta = 0$, are given in Table 4 as a function of electron temperature, taking $p = 0.1$ and using the data from Tables 1 and 2 and the Appendix. For non-zero values of β satisfying the condition (23), the tabulated N_e^c are to be mutiplied by $(1 + 2.3 \times 10^8 \beta Z^{-2})$.

Table 4. Critical densities, N_e^c, for $2 \rightarrow 3$ collisional excitation of H and He^+ ($\beta = 0$).

H I								
$t = 10^{-4} T_e$	0.3	0.35	0.4	0.5	0.75	1.0	2.0	3.0
N_e^c	–	4.3+8	9.3+7	2.6+7	6.7+6	3.6+6	1.6+6	1.3+6
He II								
$t = 10^{-4} T_e$	1.0	1.25	1.5	2.0	3.0	5.0	10.0	
N_e^c	–	1.5+11	1.1+10	2.2+9	5.5+8	1.9+8	8.7+7	

By adding the statistical equilibrium equations for $2s$ and $2p$ similar to equations (16) to the usual Case B equations, an 'extended Case B' can be obtained, which accounts for collisional effects involving the $n = 2$ levels, except those arising from the ground state. Although a subsequent paper will contain relative intensities of recombination lines at higher densities using this more general treatment, we note here that collisional transitions to higher levels will be important in driving the level populations to their LTE values as the density increases above the critical density.

When the $1s \rightarrow 2l$ collisional rates exceed the recombination rates into $2l$, the margin by which the inequalities (21) are satisfied will rapidly be reduced. In this case the critical densities appearing in Table 4 will be multiplied approximately by $[N(1s)/N_+]^{crit}/[N(1s)/N_+]$.

5 Results

5.1 DESCRIPTION OF TABLES

Results for the recombination lines of H I and He II over ranges of densities and temperatures appropriate for each ion are tabulated on the accompanying microfiches (H I in Table 8, *Microfiche* 224/1; He II in Table 9, *Microfiche* 224/1, 224/2 and 224/3). These results are valid for

Table 5. Perturbers causing l-changing collisions; numbers relative to electron number.

Spectrum	Protons	He^+	He^{2+}
H I	0.909	0.090	0.0
He II	0.833	0.0	0.0833

values of the Lyman α escape probabilities $\beta \gg \beta_c$, where β_c is given by Figs 1 and 2. The species and relative number of ions causing l-changing collisional transitions, are given in Table 5. We assume throughout that $N(\mathrm{He})/N(\mathrm{H})=0.1$. As He II recombination lines formed under rather different sets of conditions are observed in different types of objects, such as planetary nebulae and Wolf–Rayet stars, we have made trial calculations for He II which reflect the ionic abundances in these two classes of object. The 'PN' calculations were carried out with the abundances given in Table 5. The 'WR' calculation assumes that the plasma is composed entirely of He^{2+} and electrons, so that $N(He^{2+})=N(\mathrm{He})=0.5\,N_e$. Comparing the PN and WR results at $N_e=10^9$ and $T_e=20\,000$ K, we find that the maximum difference for any line-intensity ratio is about 12 per cent, which occurs in comparing lines in the infrared with lines in the ultraviolet. Absolute emissivities in the lines differ by at most 6 per cent. The difference between the PN and WR models decreases with increasing electron density. In view of these relatively small differences, we tabulate results only for the PN model. Results are given for all transitions between pairs of upper and lower principal quantum numbers n_u and n_l, respectively, in the ranges $n_u=3(1)30(5)50$ and $n_l=2(1)29$.

For each ion and each pair of parameters (T_e, N_e) we give both the relative intensities and the opacity factors, as defined below. In Tables 6 and 7 we reproduce the tabular material from the fiche for the case of H at $N_e=10^4\,\mathrm{cm}^{-3}$ and $T_e=10^4$ K. At the top of each table appears the identification of the spectrum, the values of T_e and N_e and of the parameter NC. The second line contains the value of the total recombination coefficient α_B for the ion, the effective recombination coefficient for the reference transition 4–3 or 4–2 as indicated, the power in the reference transition in $\mathrm{erg\,cm^{-3}\,s^{-1}}$, and finally the coefficients $\bar{\alpha}_{2s}$ and $\bar{\alpha}_{2p}$ defined by equation (8). The main body of the upper part of the table gives the energy in each transition n_u to n_l relative to unit energy in a reference transition, which is 4–2 for H I and 4–3 for He^+.

The lower part of the table contains, for each transition, the opacity factor $\Omega_{n,n'}$ defined as

$$\Omega_{n,n'}=\frac{e^2\sqrt{\pi}}{mc\Delta_{n,n'}}\sum_{\substack{l=0\\ l'=l\pm1}}^{n-1}\left(\frac{N_{nl}}{N_eN_+}\right)f^{\mathrm{abs}}_{nln'l'}\left(1-\frac{b_{n'l'}\exp(x_{n'})}{b_{nl}\exp(x_n)}\right)\qquad n'>n, \tag{29}$$

where $\Delta_{nn'}$ is the Doppler width in frequency units for the transition, $x_n=E_n/kT_e$, and b_{nl} are the ratios of the level populations to their LTE values. The line centre optical depth corresponding to a path length of L cm is then

$$\tau_{nn'}=N_eN_+\Omega_{nn'}L. \tag{30}$$

Note that for many transitions $\Omega_{nn'}<0$, which indicates population inversions and the potential for maser action in those transitions.

The theory used in these calculations assumes that $|\tau_{nn'}|\ll 1$ for $n'>n>1$. When using the tabulated line intensities for an $n'\rightarrow n$ transition in a particular astrophysical context, it is necessary to confirm that the optical depth given by equation (30) is small in all transitions, especially those involving states below n, n'. In this paper we do not calculate populations for $n=2$ states and consequently the opacities in the Balmer lines are unknown. However, by using the estimates of $2s$ and $2p$ level populations given by equations (16), these quantities can be calculated from equation (29). The stimulated emission factor can be ignored.

Table 6.

H TE = 1.00+04 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 2.592-13 4-2 RC = 3.034-14 4-2 EM = 1.240-25 2S RC = 8.422-14 2P RC = 1.750-13

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.39-04	2.58-04	1.11-04	5.75-05	3.36-05	2.13-05	1.43-05	1.01-05	7.39-06	5.57-06	4.30-06	3.39-06	2.72-06	2.21-06
45	1.08-03	3.31-04	1.43-04	7.40-05	4.32-05	2.74-05	1.85-05	1.30-05	9.54-06	7.19-06	5.56-06	4.38-06	3.51-06	2.86-06
40	1.43-03	4.40-04	1.90-04	9.87-05	5.78-05	3.67-05	2.48-05	1.75-05	1.28-05	9.66-06	7.47-06	5.89-06	4.73-06	3.85-06
35	1.99-03	6.16-04	2.67-04	1.39-04	8.19-05	5.22-05	3.53-05	2.50-05	1.83-05	1.38-05	1.07-05	8.47-06	6.80-06	5.55-06
30	2.90-03	9.08-04	3.98-04	2.10-04	1.24-04	7.99-05	5.43-05	3.87-05	2.85-05	2.16-05	1.68-05	1.33-05	1.07-05	8.75-06
29	3.15-03	9.87-04	4.35-04	2.30-04	1.37-04	8.78-05	5.99-05	4.27-05	3.15-05	2.39-05	1.86-05	1.47-05	1.19-05	9.71-06
28	3.41-03	1.08-03	4.75-04	2.52-04	1.50-04	9.70-05	6.63-05	4.73-05	3.50-05	2.66-05	2.07-05	1.64-05	1.32-05	1.08-05
27	3.71-03	1.17-03	5.22-04	2.78-04	1.66-04	1.08-04	7.37-05	5.27-05	3.90-05	2.97-05	2.31-05	1.84-05	1.48-05	1.21-05
26	4.05-03	1.29-03	5.75-04	3.08-04	1.85-04	1.20-04	8.24-05	5.90-05	4.38-05	3.34-05	2.60-05	2.07-05	1.67-05	1.37-05
25	4.43-03	1.42-03	6.36-04	3.43-04	2.07-04	1.34-04	9.26-05	6.65-05	4.94-05	3.77-05	2.94-05	2.34-05	1.89-05	1.55-05
24	4.87-03	1.56-03	7.07-04	3.83-04	2.32-04	1.52-04	1.05-04	7.53-05	5.60-05	4.28-05	3.34-05	2.66-05	2.15-05	1.76-05
23	5.37-03	1.74-03	7.91-04	4.31-04	2.62-04	1.72-04	1.19-04	8.59-05	6.40-05	4.90-05	3.83-05	3.05-05	2.46-05	2.01-05
22	5.97-03	1.94-03	8.91-04	4.89-04	2.99-04	1.97-04	1.36-04	9.86-05	7.36-05	5.63-05	4.41-05	3.51-05	2.83-05	2.32-05
21	6.68-03	2.18-03	1.01-03	5.58-04	3.43-04	2.26-04	1.58-04	1.14-04	8.52-05	6.53-05	5.10-05	4.06-05	3.28-05	2.68-05
20	7.54-03	2.47-03	1.16-03	6.43-04	3.97-04	2.63-04	1.83-04	1.33-04	9.94-05	7.61-05	5.95-05	4.73-05	3.81-05	3.10-05
19	8.58-03	2.83-03	1.33-03	7.47-04	4.63-04	3.08-04	2.15-04	1.56-04	1.17-04	8.94-05	6.99-05	5.54-05	4.45-05	3.61-05
18	9.87-03	3.28-03	1.56-03	8.77-04	5.46-04	3.64-04	2.54-04	1.85-04	1.38-04	1.06-04	8.25-05	6.53-05	5.22-05	4.20-05
17	1.15-02	3.84-03	1.84-03	1.04-03	6.50-04	4.34-04	3.04-04	2.21-04	1.65-04	1.26-04	9.81-05	7.73-05	6.13-05	4.83-05
16	1.35-02	4.56-03	2.20-03	1.25-03	7.82-04	5.23-04	3.66-04	2.66-04	1.99-04	1.52-04	1.17-04	9.17-05	7.13-05	5.28-05
15	1.62-02	5.49-03	2.66-03	1.52-03	9.53-04	6.38-04	4.47-04	3.24-04	2.42-04	1.84-04	1.41-04	1.08-04	7.88-05	
14	1.97-02	6.72-03	3.27-03	1.87-03	1.18-03	7.88-04	5.52-04	4.00-04	2.97-04	2.24-04	1.68-04	1.21-04		
13	2.44-02	8.37-03	4.09-03	2.35-03	1.48-03	9.89-04	6.92-04	5.00-04	3.68-04	2.72-04	1.92-04			
12	3.09-02	1.06-02	5.21-03	2.99-03	1.89-03	1.26-03	8.82-04	6.32-04	4.57-04	3.17-04				
11	4.00-02	1.38-02	6.79-03	3.91-03	2.46-03	1.65-03	1.14-03	8.04-04	5.45-04					
10	5.33-02	1.84-02	9.09-03	5.24-03	3.30-03	2.20-03	1.50-03	9.90-04						
9	7.34-02	2.54-02	1.26-02	7.25-03	4.56-03	2.99-03	1.91-03							
8	1.05-01	3.65-02	1.81-02	1.04-02	6.49-03	4.01-03								
7	1.59-01	5.53-02	2.75-02	1.58-02	9.27-03									
6	2.60-01	9.01-02	4.47-02	2.45-02										
5	4.69-01	1.62-01	7.77-02											
4	1.00+00	3.32-01												
3	2.85+00													

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.83-06	1.52-06	1.29-06	1.09-06	9.38-07	8.11-07	7.06-07	6.18-07	5.44-07	4.81-07	4.28-07	3.82-07	3.43-07	3.08-07
45	2.36-06	1.97-06	1.66-06	1.41-06	1.21-06	1.05-06	9.13-07	7.99-07	7.04-07	6.23-07	5.53-07	4.94-07	4.43-07	3.98-07
40	3.18-06	2.65-06	2.24-06	1.91-06	1.64-06	1.41-06	1.23-06	1.08-06	9.48-07	8.38-07	7.45-07	6.64-07	5.95-07	5.35-07
35	4.58-06	3.83-06	3.23-06	2.75-06	2.36-06	2.04-06	1.78-06	1.55-06	1.37-06	1.21-06	1.07-06	9.54-07	8.52-07	7.63-07
30	7.24-06	6.06-06	5.11-06	4.36-06	3.74-06	3.23-06	2.81-06	2.45-06	2.15-06	1.89-06	1.66-06	1.46-06	1.26-06	1.03-06
29	8.03-06	6.72-06	5.68-06	4.84-06	4.15-06	3.58-06	3.11-06	2.71-06	2.37-06	2.08-06	1.82-06	1.56-06	1.27-06	
28	8.96-06	7.50-06	6.33-06	5.40-06	4.63-06	3.99-06	3.46-06	3.01-06	2.63-06	2.28-06	1.96-06	1.59-06		
27	1.00-05	8.40-06	7.10-06	6.04-06	5.18-06	4.46-06	3.86-06	3.35-06	2.90-06	2.47-06	2.00-06			
26	1.13-05	9.47-06	7.99-06	6.80-06	5.82-06	5.01-06	4.31-06	3.71-06	3.16-06	2.53-06				
25	1.28-05	1.07-05	9.04-06	7.68-06	6.56-06	5.62-06	4.81-06	4.06-06	3.25-06					
24	1.46-05	1.22-05	1.03-05	8.70-06	7.40-06	6.29-06	5.29-06	4.20-06						
23	1.67-05	1.39-05	1.17-05	9.87-06	8.33-06	6.95-06	5.49-06							
22	1.91-05	1.59-05	1.33-05	1.12-05	9.25-06	7.25-06								
21	2.20-05	1.83-05	1.52-05	1.25-05	9.71-06									
20	2.55-05	2.09-05	1.71-05	1.32-05										
19	2.94-05	2.37-05	1.81-05											
18	3.35-05	2.54-05												
17	3.62-05													

Table 7.

H TE = 1.00+04 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.06-37	-2.08-38	-3.29-37	-9.62-37	-2.07-36	-3.82-36	-6.40-36	-1.00-35	-1.50-35	-2.16-35	-3.03-35	-4.19-35	-5.75-35
45	0.00+00	1.58-37	1.99-38	-3.04-37	-9.52-37	-2.04-36	-3.66-36	-5.87-36	-8.69-36	-1.21-35	-1.61-35	-2.06-35	-2.57-35	-3.16-35
40	0.00+00	2.41-37	9.75-38	-2.24-37	-8.37-37	-1.78-36	-2.98-36	-4.23-36	-5.13-36	-5.03-36	-2.98-36	2.34-36	1.27-35	3.03-35
35	0.00+00	3.84-37	2.39-37	-6.13-38	-5.92-37	-1.26-36	-1.72-36	-1.31-36	1.15-36	7.52-36	2.06-35	4.47-35	8.58-35	1.53-34
30	0.00+00	6.53-37	5.45-37	3.66-37	1.15-37	1.20-37	1.17-36	4.78-36	1.36-35	3.19-35	6.66-35	1.29-34	2.36-34	4.15-34
29	0.00+00	7.35-37	6.48-37	5.25-37	3.95-37	6.51-37	2.22-36	6.86-36	1.76-35	3.96-35	8.11-35	1.56-34	2.84-34	5.02-34
28	0.00+00	8.30-37	7.71-37	7.25-37	7.50-37	1.32-36	3.51-36	9.37-36	2.24-35	4.88-35	9.82-35	1.87-34	3.42-34	6.08-34
27	0.00+00	9.41-37	9.21-37	9.74-37	1.20-36	2.16-36	5.10-36	1.24-35	2.82-35	5.95-35	1.18-34	2.25-34	4.12-34	7.37-34
26	0.00+00	1.07-36	1.10-36	1.28-36	1.75-36	3.19-36	7.03-36	1.60-35	3.49-35	7.21-35	1.42-34	2.69-34	4.95-34	8.95-34
25	0.00+00	1.23-36	1.32-36	1.66-36	2.44-36	4.45-36	9.35-36	2.03-35	4.28-35	8.68-35	1.69-34	3.21-34	5.95-34	1.09-33
24	0.00+00	1.41-36	1.58-36	2.11-36	3.27-36	5.98-36	1.21-35	2.53-35	5.20-35	1.04-34	2.02-34	3.82-34	7.15-34	1.33-33
23	0.00+00	1.62-36	1.88-36	2.66-36	4.29-36	7.81-36	1.54-35	3.12-35	6.27-35	1.24-34	2.39-34	4.55-34	8.63-34	1.64-33
22	0.00+00	1.88-36	2.25-36	3.33-36	5.51-36	1.00-35	1.93-35	3.81-35	7.50-35	1.46-34	2.82-34	5.42-34	1.04-33	2.04-33
21	0.00+00	2.18-36	2.70-36	4.13-36	6.98-36	1.26-35	2.39-35	4.61-35	8.93-35	1.73-34	3.33-34	6.46-34	1.27-33	2.58-33
20	0.00+00	2.54-36	3.23-36	5.09-36	8.75-36	1.58-35	2.94-35	5.57-35	1.06-34	2.03-34	3.94-34	7.74-34	1.57-33	3.34-33
19	0.00+00	2.99-36	3.87-36	6.26-36	1.09-35	1.96-35	3.61-35	6.71-35	1.26-34	2.40-34	4.66-34	9.34-34	1.96-33	4.45-33
18	0.00+00	3.53-36	4.66-36	7.70-36	1.36-35	2.44-35	4.44-35	8.13-35	1.51-34	2.86-34	5.57-34	1.14-33	2.49-33	6.13-33
17	0.00+00	4.22-36	5.65-36	9.51-36	1.69-35	3.05-35	5.52-35	1.00-34	1.84-34	3.45-34	6.71-34	1.38-33	3.07-33	7.78-33
16	0.00+00	5.09-36	6.92-36	1.18-35	2.14-35	3.88-35	7.01-35	1.27-34	2.30-34	4.25-34	8.00-34	1.51-33	2.16-33	-2.00-32
15	0.00+00	6.23-36	8.58-36	1.50-35	2.75-35	5.06-35	9.23-35	1.67-34	3.00-34	5.27-34	8.14-34	-1.56-34	-3.60-32	
14	0.00+00	7.76-36	1.09-35	1.94-35	3.65-35	6.87-35	1.28-34	2.33-34	4.09-34	5.87-34	-6.35-34	-3.75-32		
13	0.00+00	9.86-36	1.41-35	2.58-35	5.03-35	9.83-35	1.90-34	3.53-34	5.65-34	-2.43-34	-3.12-32			
12	0.00+00	1.28-35	1.88-35	3.58-35	7.32-35	1.51-34	3.10-34	5.87-34	4.13-34	-2.18-32				
11	0.00+00	1.73-35	2.60-35	5.23-35	1.15-34	2.58-34	5.78-34	9.89-34	-1.18-32					
10	0.00+00	2.40-35	3.79-35	8.21-35	1.99-34	5.14-34	1.31-33	-3.27-33						
9	0.00+00	3.52-35	5.92-35	1.43-34	4.08-34	1.33-33	2.78-33							
8	0.00+00	5.50-35	1.02-34	2.92-34	1.12-33	5.82-33								
7	0.00+00	9.45-35	2.05-34	8.11-34	6.14-33									
6	0.00+00	1.88-34	5.49-34	4.72-33										
5	0.00+00	4.93-34	3.01-33											
4	0.00+00	2.48-33												
3	0.00+00													

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-7.86-35	-1.08-34	-1.49-34	-2.07-34	-2.90-34	-4.09-34	-5.82-34	-8.31-34	-1.19-33	-1.70-33	-2.42-33	-3.44-33	-4.87-33	-6.87-33
45	-3.90-35	-4.93-35	-6.49-35	-9.04-35	-1.33-34	-2.05-34	-3.26-34	-5.23-34	-8.41-34	-1.34-33	-2.13-33	-3.35-33	-5.21-33	-8.06-33
40	5.78-35	9.82-35	1.55-34	2.30-34	3.25-34	4.38-34	5.62-34	6.79-34	7.54-34	7.19-34	4.55-34	-2.53-34	-1.79-33	-4.89-33
35	2.57-34	4.17-34	6.55-34	1.01-33	1.51-33	2.25-33	3.30-33	4.79-33	6.93-33	1.00-32	1.45-32	2.11-32	3.09-32	4.59-32
30	7.10-34	1.19-33	1.97-33	3.24-33	5.34-33	8.86-33	1.49-32	2.59-32	4.67-32	8.98-32	1.91-31	4.79-31	1.65-30	1.23-29
29	8.66-34	1.47-33	2.47-33	4.16-33	7.05-33	1.21-32	2.14-32	3.93-32	7.71-32	1.67-31	4.27-31	1.50-30	1.15-29	
28	1.06-33	1.82-33	3.13-33	5.41-33	9.47-33	1.70-32	3.18-32	6.34-32	1.40-31	3.64-31	1.30-30	1.01-29		
27	1.30-33	2.28-33	4.01-33	7.15-33	1.31-32	2.48-32	5.02-32	1.12-31	2.96-31	1.07-30	8.44-30			
26	1.60-33	2.88-33	5.21-33	9.67-33	1.86-32	3.83-32	8.66-32	2.31-31	8.46-31	6.71-30				
25	1.99-33	3.67-33	6.91-33	1.35-32	2.80-32	6.41-32	1.73-31	6.37-31	5.08-30					
24	2.50-33	4.77-33	9.43-33	1.98-32	4.56-32	1.24-31	4.57-31	3.64-30						
23	3.17-33	6.35-33	1.34-32	3.11-32	8.47-32	3.13-31	2.48-30							
22	4.12-33	8.76-33	2.04-32	5.54-32	2.04-31	1.59-30								
21	5.51-33	1.28-32	3.46-32	1.25-31	9.55-31									
20	7.71-33	2.06-32	7.27-32	5.31-31										
19	1.16-32	3.91-32	2.65-31											
18	1.90-32	1.07-31												
17	2.17-32													

Interpolation of the tables of relative intensities to intermediate values of electron temperature can be readily carried out by assuming that the variation with temperature has a power-law form,

$$I(N_e, T_e, n', n) = A(N_e, n', n)\, t^{\beta}, \tag{31}$$

where $t = 10^{-4} T_e(\mathrm{K})$ and $A(N_e, n', n)$ and β are constants. A similar procedure may be used to interpolate in n' for $n' > 30$,

$$I(N_e, T_e, n', n) = B(N_e, T_e, n)\, n'^{\gamma}, \tag{32}$$

where $B(N_e, T_e, n)$ and γ are constants. Variations with electron density are generally sufficiently weak that linear interpolation suffices.

5.2 COMPARISON WITH PREVIOUS CALCULATIONS

In the calculation of b_n and b_{nl} for hydrogenic ions, the rate coefficients for *radiative* processes are in principle known exactly, and in practice can be determined to any desired level of accuracy. We expect that these rates have an error of less than 1 per cent in our calculation. A similar degree of accuracy is obtained in numerical methods. The rates for *collisional* processes are far less well known, but the values of the b-coefficients are somewhat less sensitive to these processes. It is therefore of interest to compare our values of b_n and b_{nl} with those from other calculations with a different choice of collisional rate coefficients. We do, however, consider that the cross-sections of Percival & Richards (1978), used in our calculations, are the best currently available. In the first stage calculation of b_n we can compare our results with those of Brocklehurst (1970), who tabulates b_n for H for $40 \leq n \leq 300$. We have made comparisons for $\log N_e = 3, 4, 5$ and $T_e = 5\times10^3$, 10^4 and 2×10^4 K. The largest differences are 2.8 per cent for $T_e = 5\times10^3$ K, 1.2 per cent for $T_e = 10^4$ K and 0.4 per cent for $T_e = 2\times10^4$ K. In a trial calculation, we obtained values of b_n at $T_e = 10^4$ K for electron densities of 10^4 cm^{-3} and 1.5×10^4 cm^{-3} in order to simulate by means of a density variation of 50 per cent a change in the collision rates of the same amount, which is probably a reasonable error estimate for these rates. The result of this 50 per cent change in density is to change the values of b_n by a maximum of 2.5 per cent. This largest change is at $n = 50$ where $b_n = 0.87$ and energy-changing collisional processes are becoming dominant. We conclude that the differences between our results and those of Brocklehurst (1970) most probably arise from the different choice of cross-sections for the energy-changing collision rates.

We can also make limited comparisons of our b_n for H and those of Summers (1977). We compared at $\log N_e = 4$, $T_e = 10^4$ K and $\log N_e = 5$, $T_e = 2\times10^4$ K. Summers tabulates b_{nl} for $n \leq 35$ and b_n for $n \geq 40$. For $n \geq 40$, we find maximum differences of 2 per cent between our results and those of Summers. Summers' treatment of energy-changing collisions differs from ours in that he used the semi-empirical method of van Regemorter (1962) for transitions with $|\Delta n|$ large. For the important $|\Delta n| = 1$ transitions and for other neighbouring states (Summers 1977) Summers used the impact parameter method (Seaton 1962; Burgess 1964), consistent with the cross-sections of Percival & Richards (1978) used in this work. Again the magnitude of the difference is consistent with probable uncertainties in the collision rates, although now the differences are in the opposite sense to those with respect to Brocklehurst (1970). For $n \leq 35$, differences between our b_{nl} and those of Summers are again less than 2 per cent with the exception of the $3d$ and $4d$ states, where differences of up to 4 per cent exist. These larger differences are unexpected, in that the populations of such low-lying states depend primarily on radiative processes, the rates for which are known to high precision. Summers (1977) uses an interpolation method that samples in both n and l. The most probable explanation for the disagreement for the $3d$ and $4d$ states is his rather sparse choice of n states at low n in the matrix condensation scheme (Summers 1986, personal communication).

Our results for the relative intensities and effective recombination coefficients can be

compared with those of Brocklehurst (1971) for H and He^+, and with those of Seaton (1978) for additional transitions in He^+. Brocklehurst (1971) tabulates relative line intensities for the Balmer series of H and the Pickering series of He^+. The largest difference between our results and those of Brocklehurst (1971) occur when the principal quantum number of the upper state, n, is greater than n_c, the boundary between the b_n and b_{nl} calculations in Brocklehurst's work. Differences of up to 5 per cent are found for these transitions in the H spectrum, although for smaller values of n, the agreement is generally better than 1 per cent. The larger discrepancies for $n>n_c$ are almost certainly due to the difficulties encountered by Brocklehurst in matching the solutions for b_n and b_{nl} at $n=n_c$. In He^+, differences from Brocklehurst's line intensities are generally larger, in the range 1–3 per cent, increasing with principal quantum number and decreasing with rising electron temperature.

We find slightly larger differences when comparing with the work of Seaton (1978), who obtained relative line intensities for He^+ $n\rightarrow 2$ and $n\rightarrow 3$ series. These intensities were derived from the zero-density calculations of Pengelly (1964) and the density-dependent calculations of Brocklehurst (1971) by using scaling laws. We differ from Seaton by a maximum of 6 per cent, with an average difference of 3 per cent.

Brocklehurst (1971) also tabulates values for the effective recombination coefficients for the H $4\rightarrow 2$ and He^+ $4\rightarrow 3$ transitions at a few temperature and densities. We reproduce his results for these quantities to within 1 per cent for all cases.

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Appendix: Rate coefficients for electron induced transitions in H and He^+

Consider two atomic states i and j. The collision strength $\Omega(i, j)$ for excitation from i to j is related to the cross-section σ_{ij} by

$$\sigma_{ij}=\frac{\Omega(i, j)}{E_i\omega_i}\pi a_0^2, \tag{A1}$$

where ω_i is the statistical weight of the initial state, E_i is the energy of the incident electron relative to the initial state and a_0 is the Bohr radius. The rate coefficient for excitation from i to j, q_{ij}, may be written

$$q_{ij}=8.629\times10^{-6}\frac{\Upsilon(i, j, T_e)}{\omega_i T_e^{1/2}}\exp(-\Delta E_{ij}/kT_e)\,\mathrm{cm^3\,s^{-1}}, \tag{A2}$$

where ΔE_{ij} is the energy of the transition and $\Upsilon(i, j, T_e)$ is an effective collision strength, obtained by averaging $\Omega(i, j)$ over a Maxwellian distribution of electron velocities,

$$\Upsilon(i, j, T_e)=\int_0^\infty \Omega(i, j, E_j)\exp(-E_j/kT_e)\,d(E_j/kT_e). \tag{A3}$$

We require values of Υ for transitions between the $n=1$, 2 and 3 states of H and He^+. We give the sources of this information below.

A.1 HYDROGEN 1→2 AND 1→3

We use the effective collision strengths of Aggarwal (1983), who makes the fit

$$\Upsilon(T_e)=A+BT_e+CT_e^2+DT_e^3 \tag{A4}$$

and tabulates A, B, C, D for each transition. For $1s\rightarrow 2s$ and $1s\rightarrow 2p$, Aggarwal uses the collision strengths recommended by Callaway & McDowell (1983). For the $1\rightarrow 3$ transitions he uses the work of Hata, Morgan & McDowell (1980), Syms *et al.* (1975) and Callaway & McDowell (1983).

A.2 HYDROGEN 2→3

We average the collision strengths of Hata *et al.* (1980) over energy to obtain $\bar{\Omega}(2l, 3l')$. We then assume $\Upsilon(2l, 3l', T_e)=\bar{\Omega}(2l, 3l')$. Since the data of Hata *et al.* are restricted to energies within

about 0.04 Ryd of the $n=2$ threshold, there are considerable uncertainties in the rates derived, particularly at higher temperatures.

A.3 He^+

We have carried out a six-state calculation ($1s$, $2s$, $2p$, $3s$, $3p$, $3d$) of collision strengths for He^+ in the energy region above the $n=3$ threshold. We define E_1 to be the energy (in Ryd) of the incident electron relative to the ground state of He^+, and L to be the total orbital angular momentum of the $He^+ + e^-$ system. We calculate collision strengths at the energies $E_1=3.57$, 3.8, 4.0, 4.41, 5.0 and 6.0 Ryd, for $L \leq 23$. For $0 \leq L \leq 12$ we have used the close-coupling code IMPACT (Crees, Seaton & Wilson 1978), and for $13 \leq L \leq 23$, the unitarized distorted-wave method described by Eissner & Seaton (1972). Comparison of collision strengths calculated using the two methods, at $E_1=6$ Ryd and $L=12$ shows that the agreement is good with the exception of the $2s \rightarrow 3p$ and $2s \rightarrow 3d$ transitions, where the difference is 13 per cent in both cases. This difference is due to strong coupling between the channels based on the $n=3$ states, which is not correctly treated in the unitarized distorted-wave method. The use of the distorted-wave method for $L>12$ implies a maximum uncertainty from this source of 4 per cent for these two transitions. The error is smaller for lower energies. The distorted-wave calculations have been extended to $L_{max}=23$ for $E_1=6$ Ryd and to $L_{max}=20$ for the other energies. For the two highest energies, a correction for $L>L_{max}$ has been calculated using the observation that the collision strengths are declining in a geometric progression with increasing L. More accurate calculations of the collision strengths for $L \geq L_{max}$ (Burgess 1974), are not possible in this case due to the persistence of strong coupling among the $n=3$ states. The corrections for $L \geq L_{max}$ are, in any case, small (≤ 3 per cent). For the lower energies, such corrections are negligible (<1 per cent).

Our calculated inelastic scattering collision strengths are given in Table A1. More elaborate calculations exist for energies between the $n=2$ and $n=3$ thresholds and for the $1s \rightarrow 2s$ and $1s \rightarrow 2p$ collision strengths at intermediate energies. We adopt the following values for these transitions

$1s \rightarrow 2s$	$3.0 \leq E_1 \leq 3.24$	Linear interpolation of calculation of Morgan (1980).
	$3.24 < E_1 \leq 3.556$	$\Omega = 0.147$.
	$3.556 < E_1 \leq 4.0$	$\Omega = 0.127$.
	$4.0 < E_1 \leq 4.5$	Linear interpolation of calculation of Wakid & Callaway (1980).
	$4.5 < E_1 \leq \infty$	Fit from Callaway (1983).

Table A1. Collision strengths, Ω, for $He^+ + e^-$.

	E_1 (Rydbergs)					
Transition	3.57	3.8	4.0	4.41	5.0	6.0
1s-2s	0.1267	0.1367	0.1429	0.1486	0.1491	0.1511
1s-2p	0.4405	0.5227	0.5937	0.7201	0.8405	0.9871
1s-3s	0.05098	0.06992	0.07120	0.05927	0.04714	0.03798
1s-3p	0.08308	0.1350	0.1624	0.1906	0.2059	0.2222
1s-3d	0.06160	0.05647	0.05051	0.03904	0.03194	0.02703
2s-3s	0.5052	1.067	1.412	1.859	2.204	2.461
2s-3p	2.175	2.705	2.996	3.671	4.630	6.164
2s-3d	2.077	3.213	4.009	5.010	5.992	7.041
2p-3s	2.349	1.919	1.560	1.186	0.9839	0.9125
2p-3p	5.952	6.781	7.206	7.569	8.064	8.590
2p-3d	11.80	20.14	24.84	31.26	38.43	48.43

$1s \rightarrow 2p$	$3.0 \leq E_1 \leq 3.24$	Linear interpolation of calculation of Morgan (1980).
	$3.24 < E_1 \leq 3.556$	$\Omega = 0.279 + 0.357(E_1 - 3)$.
	$3.556 < E_1 \leq 4.0$	$\Omega = 0.262 + 0.311(E_1 - 3)$.
	$4.0 < E_1 \leq \infty$	Fit from Callaway (1983).

The calculation of Morgan (1980) is the most elaborate in the near-threshold region. In the energy region $3.24 < E_1 \leq 3.556$ we use the results of the calculation by Burke & Taylor (1969) who use a three-state close coupling expansion with correlation terms. These results contain considerable resonance structure. The value of $\Omega(1s, 2s) = 0.147$ in this energy region is a simple mean of their results, whereas the linear relation for $\Omega(1s, 2p)$ is a least-squares fit to their results, this form being chosen to reflect the shape of the experimental curve of Daschenko *et al.* (1974) in this energy region. Between the $n=3$ threshold and the ionization limit, $3.556 < E_1 \leq 4.0$, we are guided by our own six-state close-coupling calculation. We consider that this calculation gives the most reliable result for the collision strengths immediately above the $n=3$ threshold, but that it increases too rapidly with increasing energy due to unaccounted for open channels. The choice of $\Omega(1s, 2s) = 0.127$ in this energy region gives a good match with the results of Wakid & Callaway (1980) at the ionization limit, whereas the linear behaviour of $\Omega(1s, 2p)$ is chosen to connect the six-state close-coupling result at the $n=3$ threshold with the Callaway (1983) fit at the ionization limit.

Using the above values for $\Omega(1s, 2s)$ and $\Omega(1s, 2p)$ and the remainder from Table A1, effective collision strengths $\Upsilon(T_e)$ have been calculated (equation A3) and fitted to the form,

$$\Upsilon(t) = a + bt + ct^2 + dt^3 \tag{A5}$$

where $t = 10^{-4} T_e(\mathrm{K})$. The fitted parameters are tabulated in Table A2. They are valid for $0 \leq t \leq 10$.

Table A2. Parameters for the fit to the $He^+ + e^-$ effective collision strengths, $\Upsilon(t) = a + bt + ct^2\lambda + dt^3$; $0 \leq t \leq 10$.

Transition	a	b	c	d
1s-2s	1.435-1	-1.156-3	7.442-5	-6.725-6
1s-2p	2.908-1	2.657-2	-1.736-3	7.498-5
1s-3s	5.042-2	6.663-3	-1.037-3	4.835-5
1s-3p	8.002-2	1.669-2	-1.448-3	5.509-5
1s-3d	6.212-2	-1.441-3	-4.799-5	5.412-6
2s-3s	4.700-1	1.759-1	-1.228-2	4.193-4
2s-3p	2.156	1.521-1	-7.095-3	3.125-4
2s-3d	1.998	3.513-1	-2.075-2	6.523-4
2p-3s	2.388	-1.361-1	7.334-3	-1.569-4
2p-3p	5.906	2.648-1	-2.352-2	9.556-4
2p-3d	1.135+1	2.584	-1.873-1	7.257-3

A.4 H AND He^+ $2s \longleftrightarrow 2p$

For these transitions we have used semi-classical impact parameter methods, with allowance for strong coupling, as described by Seaton (1962). The effects of electron, proton and He^+ collisions are included. The results for H are in good agreement with those obtained by Seaton (1955) using the Bethe approximation and allowing for strong coupling.

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Recombination-line intensities for hydrogenic ions - I. Case B calculations for HI and HeII

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The microfiches are 105 × 148mm archivally permanent silver halide film produced to internationally accepted standards in the NMA 98-image format

Microfiches produced by Micromedia, Bicester, Oxon

TABLE 8
Results for HI

H TE = 1.00+03 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 1.511-12 4-2 RC = 1.748-13 4-2 EM = 7.144-25 2S RC = 3.594-13 2P RC = 1.151-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.59-03	5.16-04	2.34-04	1.27-04	7.72-05	5.07-05	3.53-05	2.56-05	1.92-05	1.48-05	1.17-05	9.36-06	7.64-06	6.31-06
45	1.71-03	5.76-04	2.71-04	1.52-04	9.48-05	6.37-05	4.51-05	3.32-05	2.53-05	1.97-05	1.57-05	1.27-05	1.04-05	8.69-06
40	1.78-03	6.37-04	3.17-04	1.86-04	1.20-04	8.32-05	6.03-05	4.53-05	3.50-05	2.76-05	2.23-05	1.82-05	1.51-05	1.27-05
35	1.91-03	7.36-04	3.91-04	2.41-04	1.62-04	1.16-04	8.58-05	6.57-05	5.16-05	4.13-05	3.36-05	2.78-05	2.32-05	1.96-05
30	2.37-03	9.52-04	5.32-04	3.43-04	2.38-04	1.74-04	1.32-04	1.03-04	8.19-05	6.63-05	5.45-05	4.53-05	3.81-05	3.23-05
29	2.53-03	1.02-03	5.76-04	3.73-04	2.61-04	1.91-04	1.46-04	1.14-04	9.08-05	7.37-05	6.06-05	5.05-05	4.25-05	3.61-05
28	2.73-03	1.10-03	6.27-04	4.08-04	2.87-04	2.11-04	1.61-04	1.26-04	1.01-04	8.21-05	6.77-05	5.64-05	4.75-05	4.04-05
27	2.96-03	1.20-03	6.86-04	4.49-04	3.[illegible]-04	2.34-04	1.80-04	1.41-04	1.13-04	9.20-05	7.59-05	6.34-05	5.34-05	4.54-05
26	3.24-03	1.32-03	7.55-04	4.97-04	3.[illegible]-04	2.61-04	2.01-04	1.58-04	1.27-04	1.03-04	8.55-05	7.15-05	6.03-05	5.13-05
25	3.57-03	1.46-03	8.38-04	5.53-04	3.9[illegible]-04	2.93-04	2.26-04	1.78-04	1.43-04	1.17-04	9.68-05	8.10-05	6.84-05	5.82-05
24	3.97-03	1.62-03	9.36-04	6.20-04	4.4[illegible]-04	3.31-04	2.55-04	2.02-04	1.63-04	1.33-04	1.10-04	9.23-05	7.80-05	6.64-05
23	4.43-03	1.82-03	1.05-03	7.00-04	5.01-04	3.75-04	2.90-04	2.30-04	1.86-04	1.52-04	1.26-04	1.06-04	8.95-05	7.62-05
22	5.00-03	2.05-03	1.19-03	7.95-04	5.71-04	4.29-04	3.33-04	2.64-04	2.14-04	1.75-04	1.46-04	1.22-04	1.03-04	8.79-05
21	5.67-03	2.34-03	1.36-03	9.10-04	6.55-04	4.94-04	3.84-04	3.06-04	2.48-04	2.04-04	1.69-04	1.42-04	1.20-04	1.02-04
20	6.49-03	2.68-03	1.57-03	1.05-03	7.59-04	5.73-04	4.47-04	3.57-04	2.89-04	2.38-04	1.98-04	1.67-04	1.41-04	1.20-04
19	7.48-03	3.10-03	1.82-03	1.22-03	8.86-04	6.72-04	5.25-04	4.20-04	3.42-04	2.82-04	2.35-04	1.97-04	1.67-04	1.41-04
18	8.70-03	3.62-03	2.13-03	1.44-03	1.05-03	7.95-04	6.23-04	5.00-04	4.07-04	3.37-04	2.81-04	2.36-04	1.99-04	1.67-04
17	1.02-02	4.27-03	2.52-03	1.71-03	1.25-03	9.52-04	7.49-04	6.02-04	4.92-04	4.07-04	3.40-04	2.85-04	2.39-04	1.97-04
16	1.21-02	5.09-03	3.02-03	2.06-03	1.51-03	1.16-03	9.12-04	7.36-04	6.03-04	5.00-04	4.17-04	3.47-04	2.86-04	2.21-04
15	1.46-02	6.14-03	3.66-03	2.51-03	1.85-03	1.42-03	1.13-03	9.14-04	7.51-04	6.23-04	5.17-04	4.25-04	3.28-04	
14	1.78-02	7.52-03	4.52-03	3.11-03	2.31-03	1.79-03	1.42-03	1.16-03	9.54-04	7.89-04	6.46-04	4.98-04		
13	2.20-02	9.37-03	5.66-03	3.94-03	2.94-03	2.29-03	1.84-03	1.50-03	1.24-03	1.01-03	7.79-04			
12	2.77-02	1.19-02	7.26-03	5.09-03	3.84-03	3.02-03	2.44-03	2.00-03	1.63-03	1.26-03				
11	3.57-02	1.55-02	9.56-03	6.79-03	5.17-03	4.11-03	3.35-03	2.74-03	2.12-03					
10	4.73-02	2.07-02	1.30-02	9.37-03	7.26-03	5.85-03	4.78-03	3.73-03						
9	6.48-02	2.88-02	1.84-02	1.36-02	1.07-02	8.77-03	6.92-03							
8	9.26-02	4.21-02	2.77-02	2.11-02	1.71-02	1.37-02								
7	1.40-01	6.58-02	4.52-02	3.59-02	2.93-02									
6	2.31-01	1.14-01	8.37-02	6.95-02										
5	4.31-01	2.32-01	1.89-01											
4	1.00+00	6.41-01												
3	3.66+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.28-06	4.47-06	3.81-06	3.28-06	2.84-06	2.48-06	2.18-06	1.92-06	1.71-06	1.52-06	1.36-06	1.23-06	1.11-06	1.00-06
45	7.31-06	6.22-06	5.33-06	4.61-06	4.01-06	3.51-06	3.09-06	2.74-06	2.44-06	2.18-06	1.95-06	1.76-06	1.59-06	1.44-06
40	1.07-05	9.16-06	7.89-06	6.85-06	5.98-06	5.25-06	4.64-06	4.12-06	3.67-06	3.28-06	2.95-06	2.66-06	2.40-06	2.17-06
35	1.67-05	1.43-05	1.24-05	1.08-05	9.43-06	8.29-06	7.33-06	6.51-06	5.80-06	5.19-06	4.65-06	4.18-06	3.76-06	3.39-06
30	2.76-05	2.38-05	2.06-05	1.80-05	1.57-05	1.38-05	1.22-05	1.08-05	9.56-06	8.48-06	7.52-06	6.62-06	5.75-06	4.70-06
29	3.08-05	2.66-05	2.30-05	2.01-05	1.76-05	1.54-05	1.36-05	1.20-05	1.06-05	9.36-06	8.22-06	7.11-06	5.79-06	
28	3.46-05	2.98-05	2.58-05	2.25-05	1.96-05	1.72-05	1.52-05	1.34-05	1.17-05	1.03-05	8.86-06	7.19-06		
27	3.89-05	3.35-05	2.90-05	2.53-05	2.21-05	1.93-05	1.69-05	1.49-05	1.30-05	1.11-05	8.99-06			
26	4.39-05	3.78-05	3.28-05	2.85-05	2.48-05	2.17-05	1.89-05	1.65-05	1.41-05	1.13-05				
25	4.98-05	4.29-05	3.71-05	3.22-05	2.80-05	2.44-05	2.11-05	1.80-05	1.44-05					
24	5.68-05	4.89-05	4.23-05	3.66-05	3.17-05	2.73-05	2.32-05	1.85-05						
23	6.52-05	5.61-05	4.83-05	4.17-05	3.58-05	3.03-05	2.41-05							
22	7.52-05	6.45-05	5.54-05	4.74-05	3.99-05	3.16-05								
21	8.73-05	7.46-05	6.35-05	5.33-05	4.20-05									
20	1.02-04	8.63-05	7.21-05	5.67-05										
19	1.19-04	9.91-05	7.76-05											
18	1.38-04	1.08-04												
17	1.53-04													

H TE = 1.00+03 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-6.41-37	-8.13-36	-2.58-35	-6.02-35	-1.17-34	-1.96-34	-2.93-34	-3.89-34	-4.50-34	-4.17-34	-2.01-34	3.31-34	1.36-33
45	0.00+00	4.60-37	-5.75-36	-2.00-35	-4.76-35	-9.15-35	-1.49-34	-2.09-34	-2.43-34	-2.02-34	-3.30-36	4.77-34	1.43-33	3.11-33
40	0.00+00	2.47-36	-7.28-37	-7.19-36	-1.91-35	-3.56-35	-4.87-35	-3.88-35	3.25-35	2.32-34	6.67-34	1.50-33	2.99-33	5.50-33
35	0.00+00	5.62-36	7.41-36	1.47-35	3.12-35	6.54-35	1.34-34	2.69-34	5.23-34	9.82-34	1.78-33	3.14-33	5.38-33	8.99-33
30	0.00+00	1.04-35	1.96-35	4.96-35	1.16-34	2.46-34	4.77-34	8.66-34	1.50-33	2.51-33	4.08-33	6.51-33	1.03-32	1.60-32
29	0.00+00	1.17-35	2.28-35	5.91-35	1.40-34	2.98-34	5.80-34	1.05-33	1.81-33	3.01-33	4.86-33	7.67-33	1.19-32	1.85-32
28	0.00+00	1.31-35	2.64-35	6.98-35	1.68-34	3.60-34	7.01-34	1.27-33	2.19-33	3.62-33	5.81-33	9.12-33	1.41-32	2.16-32
27	0.00+00	1.48-35	3.05-35	8.22-35	2.00-34	4.31-34	8.45-34	1.54-33	2.65-33	4.38-33	7.01-33	1.10-32	1.68-32	2.56-32
26	0.00+00	1.67-35	3.52-35	9.65-35	2.37-34	5.16-34	1.02-33	1.86-33	3.22-33	5.33-33	8.54-33	1.33-32	2.05-32	3.10-32
25	0.00+00	1.89-35	4.07-35	1.13-34	2.82-34	6.19-34	1.23-33	2.27-33	3.94-33	6.55-33	1.05-32	1.65-32	2.53-32	3.83-32
24	0.00+00	2.16-35	4.71-35	1.33-34	3.35-34	7.44-34	1.49-33	2.77-33	4.85-33	8.13-33	1.32-32	2.07-32	3.20-32	4.85-32
23	0.00+00	2.47-35	5.49-35	1.57-34	4.01-34	8.98-34	1.82-33	3.41-33	6.05-33	1.02-32	1.67-32	2.66-32	4.14-32	6.31-32
22	0.00+00	2.85-35	6.42-35	1.86-34	4.81-34	1.09-33	2.24-33	4.26-33	7.63-33	1.31-32	2.17-32	3.50-32	5.51-32	8.47-32
21	0.00+00	3.31-35	7.56-35	2.23-34	5.83-34	1.34-33	2.79-33	5.38-33	9.80-33	1.71-32	2.89-32	4.74-32	7.60-32	1.18-31
20	0.00+00	3.87-35	8.99-35	2.68-34	7.12-34	1.66-33	3.52-33	6.91-33	1.28-32	2.29-32	3.96-32	6.67-32	1.09-31	1.70-31
19	0.00+00	4.57-35	1.08-34	3.27-34	8.82-34	2.10-33	4.52-33	9.07-33	1.73-32	3.17-32	5.64-32	9.81-32	1.65-31	2.51-31
18	0.00+00	5.46-35	1.31-34	4.03-34	1.11-33	2.69-33	5.93-33	1.22-32	2.40-32	4.56-32	8.45-32	1.53-31	2.62-31	3.44-31
17	0.00+00	6.58-35	1.61-34	5.06-34	1.42-33	3.53-33	8.00-33	1.71-32	3.48-32	6.92-32	1.35-31	2.56-31	4.27-31	-3.88-32
16	0.00+00	8.05-35	2.01-34	6.45-34	1.86-33	4.76-33	1.12-32	2.48-32	5.33-32	1.12-31	2.35-31	4.65-31	4.77-31	-1.45-29
15	0.00+00	9.99-35	2.55-34	8.42-34	2.50-33	6.64-33	1.63-32	3.83-32	8.80-32	2.02-31	4.59-31	8.33-31	-8.56-30	
14	0.00+00	1.26-34	3.31-34	1.13-33	3.49-33	9.70-33	2.53-32	6.39-32	1.61-31	4.17-31	1.03-30	-3.52-30		
13	0.00+00	1.62-34	4.42-34	1.57-33	5.09-33	1.51-32	4.25-32	1.19-31	3.48-31	1.07-30	4.05-31			
12	0.00+00	2.15-34	6.08-34	2.28-33	7.88-33	2.54-32	8.05-32	2.66-31	9.79-31	3.10-30				
11	0.00+00	2.92-34	8.73-34	3.50-33	1.33-32	4.85-32	1.84-31	8.04-31	4.50-30					
10	0.00+00	4.13-34	1.33-33	5.86-33	2.54-32	1.12-31	5.86-31	4.72-30						
9	0.00+00	6.14-34	2.17-33	1.11-32	5.91-32	3.72-31	4.01-30							
8	0.00+00	9.78-34	4.00-33	2.55-32	1.98-31	2.82-30								
7	0.00+00	1.72-33	8.86-33	8.48-32	1.59-30									
6	0.00+00	3.57-33	2.79-32	6.84-31										
5	0.00+00	9.96-33	2.09-31											
4	0.00+00	5.86-32												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.16-33	6.08-33	1.06-32	1.74-32	2.72-32	4.14-32	6.13-32	8.90-32	1.27-31	1.79-31	2.50-31	3.47-31	4.76-31	6.52-31
45	5.91-33	1.03-32	1.72-32	2.74-32	4.24-32	6.42-32	9.54-32	1.40-31	2.02-31	2.91-31	4.15-31	5.89-31	8.34-31	1.18-30
40	9.57-33	1.60-32	2.58-32	4.07-32	6.31-32	9.62-32	1.45-31	2.17-31	3.23-31	4.80-31	7.13-31	1.06-30	1.59-30	2.41-30
35	1.47-32	2.37-32	3.77-32	5.94-32	9.29-32	1.45-31	2.25-31	3.51-31	5.51-31	8.76-31	1.41-30	2.34-30	4.00-30	7.18-30
30	2.48-32	3.86-32	6.01-32	9.42-32	1.49-31	2.41-31	3.97-31	6.74-31	1.20-30	2.26-30	4.71-30	1.15-29	3.85-29	2.84-28
29	2.84-32	4.37-32	6.77-32	1.06-31	1.68-31	2.73-31	4.56-31	7.95-31	1.47-30	2.98-30	7.08-30	2.28-29	1.62-28	
28	3.29-32	5.03-32	7.74-32	1.21-31	1.91-31	3.11-31	5.25-31	9.36-31	1.81-30	4.03-30	1.19-29	7.76-29		
27	3.88-32	5.89-32	8.98-32	1.39-31	2.18-31	3.52-31	5.91-31	1.05-30	2.04-30	4.74-30	2.08-29			
26	4.67-32	7.02-32	1.06-31	1.61-31	2.46-31	3.80-31	6.31-31	8.07-31	2.62-31	-1.56-29				
25	5.75-32	8.56-32	1.27-31	1.85-31	2.61-31	3.19-31	1.14-31	-2.30-30	-3.72-29					
24	7.25-32	1.07-31	1.52-31	2.01-31	1.94-31	-2.10-31	-3.53-30	-4.85-29						
23	9.40-32	1.35-31	1.76-31	1.54-31	-2.95-31	-3.86-30	-5.27-29							
22	1.25-31	1.70-31	1.63-31	-2.34-31	-3.61-30	-5.19-29								
21	1.70-31	1.93-31	-9.79-32	-3.02-30	-4.80-29									
20	2.26-31	6.45-32	-2.26-30	-4.22-29										
19	2.19-31	-1.45-30	-3.54-29											
18	-6.95-31	-2.83-29												
17	-2.12-29													

H TE = 1.00+03 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 1.533-12 4-2 RC = 1.790-13 4-2 EM = 7.317-25 2S RC = 3.701-13 2P RC = 1.163-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.43-03	7.50-04	3.25-04	1.70-04	9.96-05	6.34-05	4.29-05	3.04-05	2.23-05	1.69-05	1.31-05	1.03-05	8.32-06	6.80-06
45	2.88-03	8.97-04	3.91-04	2.05-04	1.21-04	7.77-05	5.28-05	3.76-05	2.77-05	2.10-05	1.63-05	1.30-05	1.05-05	8.55-06
40	3.44-03	1.09-03	4.82-04	2.57-04	1.54-04	9.94-05	6.82-05	4.89-05	3.64-05	2.78-05	2.17-05	1.73-05	1.40-05	1.15-05
35	3.98-03	1.30-03	5.97-04	3.27-04	2.00-04	1.33-04	9.26-05	6.75-05	5.08-05	3.93-05	3.10-05	2.50-05	2.04-05	1.69-05
30	4.35-03	1.53-03	7.46-04	4.31-04	2.76-04	1.89-04	1.36-04	1.01-04	7.79-05	6.12-05	4.91-05	4.00-05	3.30-05	2.76-05
29	4.42-03	1.58-03	7.85-04	4.59-04	2.97-04	2.05-04	1.49-04	1.11-04	8.60-05	6.79-05	5.46-05	4.46-05	3.69-05	3.09-05
28	4.49-03	1.64-03	8.29-04	4.92-04	3.22-04	2.24-04	1.63-04	1.23-04	9.55-05	7.56-05	6.10-05	4.99-05	4.14-05	3.47-05
27	4.59-03	1.71-03	8.80-04	5.30-04	3.50-04	2.46-04	1.81-04	1.37-04	1.07-04	8.47-05	6.85-05	5.62-05	4.67-05	3.93-05
26	4.72-03	1.79-03	9.39-04	5.74-04	3.83-04	2.72-04	2.01-04	1.53-04	1.20-04	9.54-05	7.74-05	6.37-05	5.30-05	4.46-05
25	4.89-03	1.89-03	1.01-03	6.26-04	4.23-04	3.02-04	2.24-04	1.72-04	1.35-04	1.08-04	8.79-05	7.24-05	6.04-05	5.08-05
24	5.13-03	2.02-03	1.09-03	6.87-04	4.69-04	3.38-04	2.53-04	1.95-04	1.53-04	1.23-04	1.00-04	8.29-05	6.92-05	5.83-05
23	5.46-03	2.17-03	1.20-03	7.61-04	5.24-04	3.80-04	2.86-04	2.21-04	1.75-04	1.41-04	1.15-04	9.53-05	7.97-05	6.71-05
22	5.88-03	2.37-03	1.32-03	8.50-04	5.90-04	4.31-04	3.27-04	2.54-04	2.02-04	1.63-04	1.33-04	1.10-04	9.23-05	7.78-05
21	6.43-03	2.61-03	1.48-03	9.58-04	6.71-04	4.94-04	3.76-04	2.93-04	2.34-04	1.89-04	1.55-04	1.29-04	1.08-04	9.06-05
20	7.14-03	2.91-03	1.67-03	1.09-03	7.70-04	5.70-04	4.36-04	3.42-04	2.73-04	2.21-04	1.82-04	1.51-04	1.26-04	1.06-04
19	8.05-03	3.30-03	1.90-03	1.26-03	8.93-04	6.64-04	5.10-04	4.01-04	3.22-04	2.61-04	2.15-04	1.78-04	1.49-04	1.25-04
18	9.19-03	3.79-03	2.20-03	1.46-03	1.05-03	7.83-04	6.04-04	4.77-04	3.83-04	3.12-04	2.57-04	2.13-04	1.77-04	1.48-04
17	1.06-02	4.41-03	2.58-03	1.73-03	1.24-03	9.34-04	7.24-04	5.73-04	4.62-04	3.76-04	3.10-04	2.56-04	2.12-04	1.73-04
16	1.25-02	5.21-03	3.06-03	2.07-03	1.49-03	1.13-03	8.79-04	6.99-04	5.64-04	4.60-04	3.78-04	3.11-04	2.53-04	1.94-04
15	1.49-02	6.25-03	3.70-03	2.51-03	1.83-03	1.39-03	1.08-03	8.65-04	6.99-04	5.70-04	4.66-04	3.77-04	2.88-04	
14	1.81-02	7.62-03	4.54-03	3.10-03	2.27-03	1.74-03	1.36-03	1.09-03	8.82-04	7.16-04	5.77-04	4.38-04		
13	2.23-02	9.46-03	5.68-03	3.91-03	2.88-03	2.22-03	1.75-03	1.40-03	1.13-03	9.08-04	6.88-04			
12	2.80-02	1.20-02	7.26-03	5.05-03	3.75-03	2.91-03	2.31-03	1.85-03	1.48-03	1.12-03				
11	3.61-02	1.56-02	9.54-03	6.70-03	5.04-03	3.94-03	3.14-03	2.50-03	1.89-03					
10	4.77-02	2.08-02	1.29-02	9.23-03	7.03-03	5.54-03	4.41-03	3.34-03						
9	6.52-02	2.89-02	1.83-02	1.33-02	1.03-02	8.18-03	6.24-03							
8	9.32-02	4.22-02	2.75-02	2.05-02	1.62-02	1.25-02								
7	1.41-01	6.58-02	4.46-02	3.44-02	2.69-02									
6	2.32-01	1.13-01	8.15-02	6.47-02										
5	4.33-01	2.29-01	1.79-01											
4	1.00+00	6.15-01												
3	3.59+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.62-06	4.70-06	3.98-06	3.39-06	2.92-06	2.53-06	2.20-06	1.93-06	1.70-06	1.51-06	1.34-06	1.20-06	1.08-06	9.73-07
45	7.09-06	5.95-06	5.03-06	4.30-06	3.70-06	3.21-06	2.80-06	2.46-06	2.17-06	1.93-06	1.72-06	1.54-06	1.38-06	1.25-06
40	9.60-06	8.08-06	6.87-06	5.89-06	5.08-06	4.42-06	3.87-06	3.40-06	3.01-06	2.68-06	2.39-06	2.14-06	1.93-06	1.74-06
35	1.42-05	1.20-05	1.02-05	8.82-06	7.65-06	6.68-06	5.86-06	5.17-06	4.59-06	4.09-06	3.65-06	3.28-06	2.95-06	2.65-06
30	2.33-05	1.99-05	1.71-05	1.48-05	1.29-05	1.13-05	9.89-06	8.74-06	7.74-06	6.86-06	6.09-06	5.38-06	4.69-06	3.86-06
29	2.61-05	2.23-05	1.92-05	1.66-05	1.44-05	1.26-05	1.11-05	9.80-06	8.66-06	7.65-06	6.74-06	5.85-06	4.80-06	
28	2.94-05	2.51-05	2.16-05	1.87-05	1.63-05	1.43-05	1.25-05	1.10-05	9.69-06	8.50-06	7.35-06	6.00-06		
27	3.33-05	2.84-05	2.45-05	2.12-05	1.84-05	1.61-05	1.41-05	1.24-05	1.08-05	9.31-06	7.57-06			
26	3.78-05	3.23-05	2.78-05	2.41-05	2.09-05	1.82-05	1.59-05	1.38-05	1.19-05	9.61-06				
25	4.32-05	3.69-05	3.17-05	2.74-05	2.38-05	2.07-05	1.79-05	1.53-05	1.23-05					
24	4.95-05	4.23-05	3.63-05	3.13-05	2.71-05	2.33-05	1.98-05	1.59-05						
23	5.70-05	4.87-05	4.17-05	3.58-05	3.07-05	2.60-05	2.07-05							
22	6.60-05	5.62-05	4.80-05	4.09-05	3.44-05	2.73-05								
21	7.67-05	6.51-05	5.52-05	4.61-05	3.64-05									
20	8.95-05	7.54-05	6.27-05	4.92-05										
19	1.05-04	8.65-05	6.75-05											
18	1.21-04	9.42-05												
17	1.34-04													

H TE = 1.00+03 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-3.10-36	-1.85-35	-5.64-35	-1.33-34	-2.69-34	-4.82-34	-7.92-34	-1.21-33	-1.75-33	-2.41-33	-3.17-33	-4.00-33	-4.85-33
45	0.00+00	-2.97-36	-2.00-35	-6.14-35	-1.44-34	-2.86-34	-5.01-34	-8.00-34	-1.18-33	-1.61-33	-2.06-33	-2.43-33	-2.60-33	-2.36-33
40	0.00+00	-2.33-36	-2.08-35	-6.48-35	-1.51-34	-2.96-34	-5.07-34	-7.79-34	-1.08-33	-1.35-33	-1.46-33	-1.21-33	-2.83-34	1.79-33
35	0.00+00	-9.74-38	-1.73-35	-5.77-35	-1.36-34	-2.61-34	-4.28-34	-6.09-34	-7.29-34	-6.45-34	-1.04-34	1.31-33	4.26-33	9.78-33
30	0.00+00	5.58-36	-4.16-36	-2.46-35	-6.18-35	-1.11-34	-1.46-34	-9.61-35	1.81-34	9.55-34	2.70-33	6.23-33	1.29-32	2.50-32
29	0.00+00	7.32-36	1.83-37	-1.33-35	-3.61-35	-5.94-35	-4.96-35	7.34-35	4.71-34	1.45-33	3.53-33	7.66-33	1.54-32	2.95-32
28	0.00+00	9.32-36	5.21-36	-6.86-38	-5.83-36	1.92-36	6.44-35	2.74-34	8.12-34	2.02-33	4.50-33	9.31-33	1.83-32	3.47-32
27	0.00+00	1.16-35	1.10-35	1.53-35	2.97-35	7.46-35	2.00-34	5.13-34	1.22-33	2.70-33	5.63-33	1.12-32	2.17-32	4.09-32
26	0.00+00	1.41-35	1.74-35	3.30-35	7.13-35	1.61-34	3.63-34	8.01-34	1.71-33	3.52-33	7.00-33	1.36-32	2.58-32	4.83-32
25	0.00+00	1.70-35	2.48-35	5.33-35	1.20-34	2.64-34	5.60-34	1.15-33	2.31-33	4.53-33	8.70-33	1.65-32	3.09-32	5.77-32
24	0.00+00	2.02-35	3.30-35	7.68-35	1.78-34	3.88-34	8.01-34	1.59-33	3.07-33	5.81-33	1.09-32	2.01-32	3.74-32	6.97-32
23	0.00+00	2.39-35	4.24-35	1.04-34	2.46-34	5.38-34	1.10-33	2.14-33	4.04-33	7.47-33	1.37-32	2.50-32	4.60-32	8.59-32
22	0.00+00	2.82-35	5.33-35	1.36-34	3.29-34	7.23-34	1.47-33	2.85-33	5.30-33	9.66-33	1.75-32	3.16-32	5.78-32	1.08-31
21	0.00+00	3.31-35	6.61-35	1.75-34	4.30-34	9.55-34	1.96-33	3.77-33	7.00-33	1.27-32	2.28-32	4.10-32	7.50-32	1.41-31
20	0.00+00	3.91-35	8.13-35	2.22-34	5.57-34	1.25-33	2.59-33	5.03-33	9.37-33	1.70-32	3.05-32	5.50-32	1.01-31	1.92-31
19	0.00+00	4.64-35	9.99-35	2.80-34	7.18-34	1.64-33	3.45-33	6.78-33	1.28-32	2.34-32	4.25-32	7.72-32	1.43-31	2.72-31
18	0.00+00	5.54-35	1.23-34	3.55-34	9.30-34	2.17-33	4.64-33	9.31-33	1.79-32	3.34-32	6.19-32	1.14-31	2.13-31	3.86-31
17	0.00+00	6.69-35	1.53-34	4.53-34	1.22-33	2.91-33	6.37-33	1.31-32	2.60-32	5.01-32	9.58-32	1.82-31	3.28-31	3.28-31
16	0.00+00	8.17-35	1.92-34	5.86-34	1.62-33	3.98-33	9.01-33	1.92-32	3.96-32	8.02-32	1.61-31	3.10-31	3.79-31	-6.53-30
15	0.00+00	1.01-34	2.45-34	7.71-34	2.20-33	5.61-33	1.32-32	2.97-32	6.48-32	1.40-31	2.99-31	5.00-31	-4.64-30	
14	0.00+00	1.28-34	3.19-34	1.04-33	3.08-33	8.24-33	2.05-32	4.93-32	1.17-31	2.79-31	6.11-31	-2.42-30		
13	0.00+00	1.65-34	4.26-34	1.45-33	4.51-33	1.28-32	3.44-32	9.10-32	2.45-31	6.68-31	-2.97-31			
12	0.00+00	2.17-34	5.87-34	2.10-33	6.99-33	2.16-32	6.45-32	1.98-31	6.54-31	1.43-30				
11	0.00+00	2.96-34	8.43-34	3.24-33	1.18-32	4.08-32	1.45-31	5.73-31	2.57-30					
10	0.00+00	4.18-34	1.28-33	5.40-33	2.23-32	9.33-32	4.45-31	3.03-30						
9	0.00+00	6.21-34	2.09-33	1.02-32	5.14-32	3.00-31	2.83-30							
8	0.00+00	9.89-34	3.84-33	2.33-32	1.69-31	2.15-30								
7	0.00+00	1.74-33	8.47-33	7.63-32	1.31-30									
6	0.00+00	3.59-33	2.64-32	6.00-31										
5	0.00+00	1.00-32	1.94-31											
4	0.00+00	5.82-32												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.65-33	-6.28-33	-6.64-33	-6.58-33	-5.97-33	-4.68-33	-2.67-33	-1.18-35	3.03-33	5.81-33	7.15-33	5.02-33	-3.84-33	-2.45-32
45	-1.43-33	5.78-34	4.18-33	1.00-32	1.91-32	3.23-32	5.11-32	7.71-32	1.12-31	1.59-31	2.20-31	2.98-31	3.95-31	5.16-31
40	5.69-33	1.24-32	2.34-32	4.05-32	6.67-32	1.06-31	1.63-31	2.46-31	3.66-31	5.37-31	7.84-31	1.14-30	1.65-30	2.41-30
35	1.95-32	3.58-32	6.25-32	1.05-31	1.73-31	2.79-31	4.46-31	7.08-31	1.13-30	1.80-30	2.91-30	4.81-30	8.20-30	1.46-29
30	4.65-32	8.37-32	1.48-31	2.58-31	4.50-31	7.87-31	1.40-30	2.55-30	4.84-30	9.80-30	2.19-29	5.80-29	2.10-28	1.66-27
29	5.46-32	9.88-32	1.76-31	3.13-31	5.57-31	1.00-30	1.85-30	3.56-30	7.29-30	1.65-29	4.39-29	1.60-28	1.26-27	
28	6.42-32	1.17-31	2.11-31	3.82-31	7.00-31	1.31-30	2.55-30	5.27-30	1.20-29	3.22-29	1.18-28	9.29-28		
27	7.57-32	1.39-31	2.56-31	4.75-31	9.01-31	1.77-30	3.70-30	8.48-30	2.29-29	8.38-29	6.60-28			
26	8.99-32	1.67-31	3.14-31	6.03-31	1.20-30	2.52-30	5.81-30	1.57-29	5.76-29	4.52-28				
25	1.08-31	2.04-31	3.95-31	7.89-31	1.67-30	3.87-30	1.05-29	3.82-29	2.96-28					
24	1.32-31	2.54-31	5.09-31	1.08-30	2.49-30	6.72-30	2.43-29	1.85-28						
23	1.64-31	3.26-31	6.84-31	1.57-30	4.17-30	1.48-29	1.09-28							
22	2.11-31	4.32-31	9.67-31	2.49-30	8.45-30	5.85-29								
21	2.80-31	5.99-31	1.46-30	4.52-30	2.68-29									
20	3.87-31	8.56-31	2.23-30	8.09-30										
19	5.37-31	1.01-30	-1.91-30											
18	4.73-31	-6.39-30												
17	-7.43-30													

H TE = 1.00+03 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 1.576-12 4-2 RC = 1.863-13 4-2 LM = 7.615-25 2S RC = 3.891-13 2P RC = 1.187-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.79-03	1.16-03	5.01-04	2.60-04	1.52-04	9.61-05	6.47-05	4.56-05	3.34-05	2.52-05	1.94-05	1.53-05	1.23-05	1.00-05
45	4.36-03	1.34-03	5.78-04	3.00-04	1.75-04	1.11-04	7.49-05	5.29-05	3.87-05	2.92-05	2.25-05	1.78-05	1.43-05	1.16-05
40	5.02-03	1.55-03	6.68-04	3.47-04	2.03-04	1.29-04	8.72-05	6.16-05	4.52-05	3.41-05	2.64-05	2.08-05	1.67-05	1.36-05
35	6.08-03	1.88-03	8.17-04	4.27-04	2.51-04	1.60-04	1.08-04	7.69-05	5.65-05	4.28-05	3.32-05	2.62-05	2.11-05	1.72-05
30	7.71-03	2.42-03	1.07-03	5.65-04	3.37-04	2.17-04	1.48-04	1.06-04	7.86-05	5.98-05	4.67-05	3.71-05	3.00-05	2.46-05
29	8.08-03	2.56-03	1.13-03	6.02-04	3.60-04	2.33-04	1.60-04	1.15-04	8.51-05	6.50-05	5.08-05	4.04-05	3.28-05	2.69-05
28	8.46-03	2.69-03	1.20-03	6.43-04	3.86-04	2.51-04	1.73-04	1.24-04	9.27-05	7.09-05	5.55-05	4.43-05	3.60-05	2.96-05
27	8.84-03	2.84-03	1.28-03	6.88-04	4.16-04	2.72-04	1.88-04	1.36-04	1.01-04	7.79-05	6.12-05	4.90-05	3.98-05	3.28-05
26	9.21-03	2.99-03	1.36-03	7.38-04	4.50-04	2.96-04	2.06-04	1.49-04	1.12-04	8.62-05	6.79-05	5.45-05	4.44-05	3.67-05
25	9.55-03	3.14-03	1.44-03	7.94-04	4.88-04	3.23-04	2.26-04	1.65-04	1.24-04	9.62-05	7.60-05	6.12-05	5.00-05	4.13-05
24	9.88-03	3.30-03	1.54-03	8.57-04	5.32-04	3.56-04	2.51-04	1.84-04	1.39-04	1.08-04	8.58-05	6.93-05	5.67-05	4.70-05
23	1.02-02	3.47-03	1.65-03	9.30-04	5.84-04	3.94-04	2.80-04	2.07-04	1.57-04	1.23-04	9.78-05	7.92-05	6.50-05	5.40-05
22	1.05-02	3.65-03	1.77-03	1.02-03	6.46-04	4.41-04	3.16-04	2.35-04	1.80-04	1.41-04	1.13-04	9.14-05	7.52-05	6.26-05
21	1.08-02	3.85-03	1.91-03	1.12-03	7.21-04	4.97-04	3.59-04	2.69-04	2.07-04	1.63-04	1.31-04	1.07-04	8.78-05	7.32-05
20	1.12-02	4.10-03	2.08-03	1.24-03	8.12-04	5.67-04	4.13-04	3.12-04	2.41-04	1.91-04	1.54-04	1.25-04	1.04-04	8.62-05
19	1.17-02	4.39-03	2.29-03	1.39-03	9.26-04	6.54-04	4.81-04	3.65-04	2.85-04	2.26-04	1.82-04	1.49-04	1.23-04	1.02-04
18	1.24-02	4.78-03	2.55-03	1.58-03	1.07-03	7.63-04	5.67-04	4.33-04	3.39-04	2.70-04	2.18-04	1.79-04	1.47-04	1.21-04
17	1.34-02	5.29-03	2.89-03	1.83-03	1.25-03	9.03-04	6.76-04	5.20-04	4.09-04	3.27-04	2.64-04	2.16-04	1.77-04	1.43-04
16	1.48-02	5.97-03	3.34-03	2.14-03	1.49-03	1.08-03	8.18-04	6.33-04	4.99-04	3.99-04	3.23-04	2.62-04	2.11-04	1.61-04
15	1.68-02	6.89-03	3.92-03	2.56-03	1.80-03	1.32-03	1.01-03	7.82-04	6.18-04	4.94-04	3.97-04	3.17-04	2.40-04	
14	1.97-02	8.14-03	4.71-03	3.12-03	2.22-03	1.65-03	1.26-03	9.81-04	7.77-04	6.19-04	4.90-04	3.68-04		
13	2.36-02	9.87-03	5.80-03	3.89-03	2.79-03	2.09-03	1.61-03	1.26-03	9.91-04	7.78-04	5.80-04			
12	2.92-02	1.23-02	7.33-03	4.98-03	3.61-03	2.72-03	2.10-03	1.64-03	1.28-03	9.46-04				
11	3.71-02	1.58-02	9.54-03	6.56-03	4.81-03	3.65-03	2.82-03	2.18-03	1.61-03					
10	4.87-02	2.10-02	1.29-02	8.97-03	6.64-03	5.08-03	3.90-03	2.86-03						
9	6.63-02	2.91-02	1.81-02	1.28-02	9.63-03	7.36-03	5.39-03							
8	9.45-02	4.23-02	2.70-02	1.95-02	1.48-02	1.09-02								
7	1.43-01	6.57-02	4.33-02	3.21-02	2.38-02									
6	2.34-01	1.12-01	7.78-02	5.82-02										
5	4.36-01	2.24-01	1.64-01											
4	1.00+00	5.78-01												
3	3.48+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.25-06	6.89-06	5.81-06	4.94-06	4.24-06	3.67-06	3.19-06	2.79-06	2.46-06	2.18-06	1.94-06	1.73-06	1.55-06	1.39-06
45	9.59-06	8.01-06	6.75-06	5.75-06	4.93-06	4.27-06	3.71-06	3.25-06	2.86-06	2.53-06	2.25-06	2.01-06	1.80-06	1.62-06
40	1.13-05	9.49-06	7.93-06	6.76-06	5.80-06	5.02-06	4.37-06	3.83-06	3.37-06	2.98-06	2.65-06	2.37-06	2.12-06	1.91-06
35	1.43-05	1.19-05	1.01-05	8.60-06	7.39-06	6.40-06	5.57-06	4.88-06	4.30-06	3.81-06	3.38-06	3.02-06	2.70-06	2.42-06
30	2.04-05	1.72-05	1.46-05	1.24-05	1.07-05	9.29-06	8.11-06	7.10-06	6.25-06	5.51-06	4.87-06	4.29-06	3.73-06	3.06-06
29	2.24-05	1.88-05	1.60-05	1.37-05	1.18-05	1.02-05	8.90-06	7.80-06	6.85-06	6.03-06	5.29-06	4.58-06	3.75-06	
28	2.47-05	2.07-05	1.76-05	1.51-05	1.30-05	1.13-05	9.84-06	8.61-06	7.54-06	6.59-06	5.69-06	4.65-06		
27	2.74-05	2.31-05	1.96-05	1.68-05	1.45-05	1.26-05	1.09-05	9.55-06	8.32-06	7.16-06	5.83-06			
26	3.06-05	2.59-05	2.20-05	1.89-05	1.63-05	1.41-05	1.22-05	1.06-05	9.11-06	7.39-06				
25	3.46-05	2.92-05	2.49-05	2.14-05	1.84-05	1.59-05	1.37-05	1.17-05	9.48-06					
24	3.94-05	3.33-05	2.84-05	2.43-05	2.09-05	1.80-05	1.53-05	1.23-05						
23	4.53-05	3.84-05	3.27-05	2.79-05	2.39-05	2.02-05	1.62-05							
22	5.26-05	4.45-05	3.78-05	3.21-05	2.70-05	2.15-05								
21	6.14-05	5.18-05	4.38-05	3.66-05	2.90-05									
20	7.22-05	6.06-05	5.03-05	3.96-05										
19	8.51-05	7.01-05	5.48-05											
18	9.94-05	7.71-05												
17	1.10-04													

H TE = 1.00+03 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-7.30-36	-3.71-35	-1.15-34	-2.83-34	-6.00-34	-1.15-33	-2.04-33	-3.40-33	-5.44-33	-8.39-33	-1.26-32	-1.84-32	-2.66-32
45	0.00+00	-7.57-36	-4.04-35	-1.25-34	-3.07-34	-6.46-34	-1.23-33	-2.15-33	-3.57-33	-5.66-33	-8.67-33	-1.29-32	-1.89-32	-2.72-32
40	0.00+00	-7.25-36	-4.25-35	-1.32-34	-3.19-34	-6.63-34	-1.24-33	-2.13-33	-3.46-33	-5.37-33	-8.03-33	-1.17-32	-1.68-32	-2.38-32
35	0.00+00	-6.59-36	-4.55-35	-1.42-34	-3.40-34	-6.91-34	-1.25-33	-2.09-33	-3.26-33	-4.80-33	-6.78-33	-9.23-33	-1.22-32	-1.59-32
30	0.00+00	-4.62-36	-4.80-35	-1.53-34	-3.64-34	-7.25-34	-1.27-33	-2.00-33	-2.86-33	-3.71-33	-4.23-33	-3.89-33	-1.78-33	3.48-33
29	0.00+00	-3.74-36	-4.76-35	-1.54-34	-3.64-34	-7.21-34	-1.25-33	-1.93-33	-2.68-33	-3.28-33	-3.28-33	-1.91-33	2.15-33	1.10-32
28	0.00+00	-2.56-36	-4.64-35	-1.52-34	-3.60-34	-7.09-34	-1.21-33	-1.83-33	-2.44-33	-2.72-33	-2.06-33	6.17-34	7.20-33	2.08-32
27	0.00+00	-1.01-36	-4.43-35	-1.48-34	-3.51-34	-6.86-34	-1.15-33	-1.69-33	-2.11-33	-1.99-33	-4.98-34	3.85-33	1.37-32	3.37-32
26	0.00+00	1.03-36	-4.09-35	-1.40-34	-3.34-34	-6.47-34	-1.07-33	-1.50-33	-1.68-33	-1.04-33	1.50-33	8.01-33	2.22-32	5.09-32
25	0.00+00	3.66-36	-3.59-35	-1.28-34	-3.08-34	-5.89-34	-9.42-34	-1.23-33	-1.10-33	1.71-34	4.06-33	1.34-32	3.34-32	7.40-32
24	0.00+00	7.03-36	-2.88-35	-1.11-34	-2.69-34	-5.06-34	-7.70-34	-8.72-34	-3.62-34	1.73-33	7.34-33	2.03-32	4.82-32	1.06-31
23	0.00+00	1.13-35	-1.94-35	-8.89-35	-2.15-34	-3.93-34	-5.37-34	-4.03-34	5.96-34	3.72-33	1.16-32	2.94-32	6.81-32	1.50-31
22	0.00+00	1.65-35	-7.18-36	-5.68-35	-1.43-34	-2.41-34	-2.30-34	2.10-34	1.83-33	6.28-33	1.70-32	4.15-32	9.56-32	2.15-31
21	0.00+00	2.29-35	8.28-36	-1.64-35	-4.91-35	-3.99-35	1.75-34	1.01-33	3.44-33	9.63-33	2.43-32	5.80-32	1.35-31	3.15-31
20	0.00+00	3.07-35	2.74-35	3.50-35	7.31-35	2.23-34	7.08-34	2.07-33	5.58-33	1.41-32	3.42-32	8.13-32	1.94-31	4.78-31
19	0.00+00	4.00-35	5.09-35	9.96-35	2.30-34	5.68-34	1.42-33	3.50-33	8.48-33	2.03-32	4.83-32	1.16-31	2.90-31	7.75-31
18	0.00+00	5.13-35	7.95-35	1.81-34	4.35-34	1.03-33	2.39-33	5.49-33	1.26-32	2.93-32	6.95-32	1.72-31	4.60-31	1.41-30
17	0.00+00	6.49-35	1.15-34	2.84-34	7.05-34	1.66-33	3.77-33	8.42-33	1.89-32	4.34-32	1.04-31	2.72-31	8.13-31	3.15-30
16	0.00+00	8.17-35	1.58-34	4.18-34	1.07-33	2.56-33	5.82-33	.30-32	2.90-32	6.74-32	1.68-31	4.77-31	1.72-30	1.14-29
15	0.00+00	1.03-34	2.14-34	5.99-34	1.59-33	3.90-33	9.05-33	2.05-32	4.70-32	1.13-31	3.01-31	9.71-31	4.79-30	
14	0.00+00	1.31-34	2.90-34	8.53-34	2.36-33	6.02-33	1.45-32	3.44-32	8.29-32	2.14-31	6.25-31	1.86-30		
13	0.00+00	1.69-34	3.95-34	1.23-33	3.58-33	9.63-33	2.47-32	6.31-32	1.68-31	4.85-31	9.99-31			
12	0.00+00	2.23-34	5.51-34	1.82-33	5.67-33	1.64-32	4.64-32	1.34-31	4.23-31	1.08-30				
11	0.00+00	3.03-34	7.96-34	2.83-33	9.63-33	3.12-32	1.03-31	3.73-31	1.47-30					
10	0.00+00	4.28-34	1.21-33	4.75-33	1.83-32	7.06-32	3.06-31	1.77-30						
9	0.00+00	6.36-34	1.98-33	8.92-33	4.18-32	2.21-31	1.79-30							
8	0.00+00	1.01-33	3.62-33	2.02-32	1.34-31	1.49-30								
7	0.00+00	1.78-33	7.93-33	6.52-32	9.90-31									
6	0.00+00	3.66-33	2.44-32	4.95-31										
5	0.00+00	1.01-32	1.75-31											
4	0.00+00	5.79-32												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-3.78-32	-5.33-32	-7.45-32	-1.04-31	-1.43-31	-1.98-31	-2.71-31	-3.71-31	-5.07-31	-6.89-31	-9.35-31	-1.27-30	-1.71-30	-2.32-30
45	-3.89-32	-5.51-32	-7.79-32	-1.10-31	-1.55-31	-2.19-31	-3.08-31	-4.35-31	-6.13-31	-8.64-31	-1.22-30	-1.72-30	-2.43-30	-3.45-30
40	-3.36-32	-4.76-32	-6.77-32	-9.72-32	-1.41-31	-2.06-31	-3.04-31	-4.52-31	-6.75-31	-1.01-30	-1.53-30	-2.33-30	-3.59-30	-5.59-30
35	-2.07-32	-2.72-32	-3.70-32	-5.27-32	-7.96-32	-1.26-31	-2.08-31	-3.54-31	-6.13-31	-1.08-30	-1.93-30	-3.52-30	-6.63-30	-1.31-29
30	1.40-32	3.28-32	6.44-32	1.15-31	1.93-31	3.12-31	4.89-31	7.48-31	1.11-30	1.57-30	1.91-30	5.35-31	-1.57-29	-2.79-28
29	2.80-32	5.85-32	1.11-31	1.98-31	3.41-31	5.79-31	9.78-31	1.67-30	2.93-30	5.45-30	1.12-29	2.80-29	1.10-28	
28	4.67-32	9.35-32	1.76-31	3.19-31	5.71-31	1.02-30	1.86-30	3.53-30	7.24-30	1.72-29	5.40-29	3.54-28		
27	7.19-32	1.42-31	2.71-31	5.05-31	9.43-31	1.80-30	3.58-30	7.75-30	1.95-29	6.65-29	4.83-28			
26	1.06-31	2.12-31	4.12-31	7.99-31	1.58-30	3.27-30	7.36-30	1.93-29	6.88-29	5.26-28				
25	1.55-31	3.13-31	6.31-31	1.29-30	2.76-30	6.03-30	1.44-29	6.40-29	5.05-28					
24	2.24-31	4.63-31	9.90-31	2.18-30	5.23-30	1.26-29	5.49-29	4.44-28						
23	3.26-31	7.14-31	1.62-30	3.99-30	1.14-29	4.39-29	3.62-28							
22	4.87-31	1.14-30	2.88-30	8.40-30	3.29-29	2.75-28								
21	7.56-31	1.96-30	5.83-30	2.32-29	1.95-28									
20	1.26-30	3.82-30	1.54-29	1.30-28										
19	2.37-30	9.60-30	8.02-29											
18	5.64-30	4.59-29												
17	2.41-29													

H TE = 1.00+03 NE = 1.00+05 CASE B NC = 53

TOTAL RC = 1.657-12 4-2 RC = 1.986-13 4-2 EM = 8.115-25 2S RC = 4.226-13 2P RC = 1.235-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.72-03	1.45-03	6.23-04	3.23-04	1.88-04	1.19-04	8.02-05	5.66-05	4.14-05	3.11-05	2.40-05	1.89-05	1.52-05	1.24-05
45	6.14-03	1.88-03	8.10-04	4.20-04	2.45-04	1.55-04	1.04-04	7.36-05	5.38-05	4.05-05	3.13-05	2.46-05	1.97-05	1.61-05
40	7.84-03	2.41-03	1.04-03	5.36-04	3.13-04	1.98-04	1.34-04	9.41-05	6.88-05	5.18-05	4.00-05	3.15-05	2.53-05	2.06-05
35	9.55-03	2.93-03	1.26-03	6.54-04	3.82-04	2.42-04	1.63-04	1.15-04	8.41-05	6.34-05	4.89-05	3.85-05	3.09-05	2.52-05
30	1.12-02	3.45-03	1.49-03	7.72-04	4.52-04	2.87-04	1.93-04	1.37-04	1.00-04	7.54-05	5.82-05	4.59-05	3.68-05	3.00-05
29	1.16-02	3.58-03	1.55-03	8.04-04	4.70-04	2.99-04	2.02-04	1.42-04	1.04-04	7.87-05	6.08-05	4.80-05	3.85-05	3.13-05
28	1.21-02	3.74-03	1.62-03	8.41-04	4.93-04	3.13-04	2.11-04	1.49-04	1.10-04	8.26-05	6.39-05	5.04-05	4.05-05	3.30-05
27	1.27-02	3.93-03	1.70-03	8.85-04	5.19-04	3.30-04	2.23-04	1.58-04	1.16-04	8.74-05	6.76-05	5.34-05	4.29-05	3.49-05
26	1.34-02	4.15-03	1.80-03	9.38-04	5.51-04	3.51-04	2.37-04	1.68-04	1.23-04	9.32-05	7.22-05	5.70-05	4.58-05	3.73-05
25	1.42-02	4.41-03	1.91-03	1.00-03	5.89-04	3.76-04	2.54-04	1.80-04	1.33-04	1.00-04	7.77-05	6.14-05	4.93-05	4.02-05
24	1.51-02	4.70-03	2.05-03	1.07-03	6.33-04	4.05-04	2.75-04	1.95-04	1.44-04	1.09-04	8.44-05	6.67-05	5.37-05	4.38-05
23	1.62-02	5.04-03	2.20-03	1.16-03	6.86-04	4.40-04	2.99-04	2.13-04	1.57-04	1.19-04	9.25-05	7.33-05	5.90-05	4.82-05
22	1.73-02	5.42-03	2.38-03	1.26-03	7.47-04	4.81-04	3.28-04	2.34-04	1.73-04	1.32-04	1.02-04	8.13-05	6.55-05	5.36-05
21	1.85-02	5.83-03	2.58-03	1.37-03	8.20-04	5.30-04	3.64-04	2.60-04	1.93-04	1.47-04	1.15-04	9.13-05	7.37-05	6.03-05
20	1.97-02	6.29-03	2.81-03	1.51-03	9.07-04	5.90-04	4.07-04	2.93-04	2.18-04	1.67-04	1.30-04	1.04-04	8.39-05	6.87-05
19	2.10-02	6.79-03	3.07-03	1.66-03	1.01-03	6.63-04	4.60-04	3.33-04	2.49-04	1.91-04	1.50-04	1.20-04	9.70-05	7.94-05
18	2.23-02	7.32-03	3.37-03	1.85-03	1.14-03	7.54-04	5.27-04	3.84-04	2.89-04	2.23-04	1.76-04	1.41-04	1.14-04	9.28-05
17	2.35-02	7.92-03	3.72-03	2.08-03	1.30-03	8.70-04	6.14-04	4.51-04	3.42-04	2.65-04	2.09-04	1.68-04	1.35-04	1.09-04
16	2.49-02	8.60-03	4.15-03	2.37-03	1.50-03	1.02-03	7.29-04	5.40-04	4.11-04	3.20-04	2.54-04	2.03-04	1.62-04	1.23-04
15	2.64-02	9.43-03	4.69-03	2.75-03	1.77-03	1.22-03	8.83-04	6.60-04	5.06-04	3.95-04	3.12-04	2.46-04	1.85-04	
14	2.83-02	1.05-02	5.40-03	3.25-03	2.14-03	1.50-03	1.09-03	8.23-04	6.34-04	4.94-04	3.86-04	2.87-04		
13	3.12-02	1.20-02	6.37-03	3.94-03	2.65-03	1.88-03	1.39-03	1.05-03	8.08-04	6.22-04	4.59-04			
12	3.55-02	1.41-02	7.76-03	4.93-03	3.38-03	2.43-03	1.80-03	1.37-03	1.04-03	7.57-04				
11	4.23-02	1.73-02	9.80-03	6.37-03	4.44-03	3.23-03	2.41-03	1.81-03	1.30-03					
10	5.29-02	2.21-02	1.29-02	8.56-03	6.06-03	4.44-03	3.29-03	2.34-03						
9	6.99-02	2.98-02	1.78-02	1.21-02	8.64-03	6.31-03	4.45-03							
8	9.78-02	4.26-02	2.61-02	1.80-02	1.30-02	9.07-03								
7	1.46-01	6.55-02	4.13-02	2.90-02	2.02-02									
6	2.39-01	1.11-01	7.24-02	5.02-02										
5	4.41-01	2.16-01	1.45-01											
4	1.00+00	5.29-01												
3	3.35+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.02-05	8.50-06	7.17-06	6.10-06	5.23-06	4.52-06	3.93-06	3.44-06	3.03-06	2.68-06	2.38-06	2.13-06	1.91-06	1.71-06
45	1.33-05	1.11-05	9.32-06	7.93-06	6.80-06	5.87-06	5.11-06	4.47-06	3.93-06	3.48-06	3.09-06	2.76-06	2.47-06	2.22-06
40	1.70-05	1.41-05	1.19-05	1.01-05	8.70-06	7.51-06	6.53-06	5.71-06	5.03-06	4.44-06	3.95-06	3.52-06	3.15-06	2.83-06
35	2.07-05	1.73-05	1.46-05	1.24-05	1.06-05	9.18-06	7.98-06	6.98-06	6.13-06	5.41-06	4.80-06	4.27-06	3.81-06	3.41-06
30	2.47-05	2.06-05	1.74-05	1.48-05	1.27-05	1.09-05	9.49-06	8.28-06	7.25-06	6.37-06	5.60-06	4.91-06	4.25-06	3.48-06
29	2.59-05	2.16-05	1.82-05	1.55-05	1.32-05	1.14-05	9.90-06	8.63-06	7.54-06	6.60-06	5.77-06	4.97-06	4.06-06	
28	2.72-05	2.27-05	1.91-05	1.63-05	1.39-05	1.20-05	1.04-05	9.04-06	7.87-06	6.85-06	5.88-06	4.78-06		
27	2.88-05	2.41-05	2.03-05	1.72-05	1.47-05	1.27-05	1.10-05	9.51-06	8.23-06	7.04-06	5.70-06			
26	3.08-05	2.57-05	2.17-05	1.84-05	1.57-05	1.35-05	1.17-05	1.00-05	8.55-06	6.89-06				
25	3.32-05	2.77-05	2.34-05	1.98-05	1.69-05	1.45-05	1.24-05	1.05-05	8.45-06					
24	3.62-05	3.02-05	2.54-05	2.16-05	1.84-05	1.56-05	1.32-05	1.05-05						
23	3.98-05	3.32-05	2.80-05	2.36-05	2.00-05	1.68-05	1.33-05							
22	4.43-05	3.69-05	3.10-05	2.61-05	2.17-05	1.72-05								
21	4.98-05	4.15-05	3.46-05	2.87-05	2.26-05									
20	5.67-05	4.70-05	3.87-05	3.03-05										
19	6.53-05	5.34-05	4.15-05											
18	7.53-05	5.82-05												
17	8.35-05													

H TE = 1.00+03 NE = 1.00+05 CASE B NC = 53

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.08-35	-5.29-35	-1.65-34	-4.12-34	-8.91-34	-1.74-33	-3.15-33	-5.39-33	-8.81-33	-1.39-32	-2.14-32	-3.21-32	-4.73-32
45	0.00+00	-1.37-35	-6.83-35	-2.14-34	-5.36-34	-1.16-33	-2.28-33	-4.14-33	-7.12-33	-1.17-32	-1.87-32	-2.90-32	-4.40-32	-6.56-32
40	0.00+00	-1.68-35	-8.55-35	-2.69-34	-6.76-34	-1.47-33	-2.89-33	-5.28-33	-9.13-33	-1.52-32	-2.44-32	-3.83-32	-5.91-32	-8.97-32
35	0.00+00	-1.83-35	-9.87-35	-3.13-34	-7.85-34	-1.71-33	-3.35-33	-6.14-33	-1.07-32	-1.79-32	-2.91-32	-4.65-32	-7.32-32	-1.14-31
30	0.00+00	-1.64-35	-1.03-34	-3.29-34	-8.21-34	-1.77-33	-3.44-33	-6.25-33	-1.08-32	-1.81-32	-2.97-32	-4.82-32	-7.61-32	-1.27-31
29	0.00+00	-1.57-35	-1.03-34	-3.31-34	-8.26-34	-1.77-33	-3.44-33	-6.21-33	-1.07-32	-1.79-32	-2.93-32	-4.77-32	-7.78-32	-1.28-31
28	0.00+00	-1.50-35	-1.04-34	-3.35-34	-8.32-34	-1.78-33	-3.43-33	-6.18-33	-1.06-32	-1.76-32	-2.88-32	-4.70-32	-7.72-32	-1.28-31
27	0.00+00	-1.41-35	-1.05-34	-3.39-34	-8.42-34	-1.79-33	-3.44-33	-6.15-33	-1.05-32	-1.73-32	-2.82-32	-4.61-32	-7.62-32	-1.28-31
26	0.00+00	-1.31-35	-1.06-34	-3.45-34	-8.55-34	-1.81-33	-3.45-33	-6.13-33	-1.03-32	-1.70-32	-2.75-32	-4.49-32	-7.46-32	-1.27-31
25	0.00+00	-1.19-35	-1.08-34	-3.52-34	-8.70-34	-1.83-33	-3.48-33	-6.11-33	-1.02-32	-1.65-32	-2.65-32	-4.30-32	-7.18-32	-1.25-31
24	0.00+00	-1.04-35	-1.09-34	-3.59-34	-8.86-34	-1.86-33	-3.49-33	-6.07-33	-9.98-33	-1.59-32	-2.50-32	-4.01-32	-6.67-32	-1.18-31
23	0.00+00	-8.39-36	-1.09-34	-3.65-34	-9.01-34	-1.88-33	-3.50-33	-5.98-33	-9.63-33	-1.49-32	-2.27-32	-3.51-32	-5.75-32	-1.02-31
22	0.00+00	-5.63-36	-1.09-34	-3.68-34	-9.10-34	-1.89-33	-3.47-33	-5.81-33	-9.03-33	-1.33-32	-1.88-32	-2.66-32	-4.02-32	-6.98-32
21	0.00+00	-1.80-36	-1.06-34	-3.67-34	-9.08-34	-1.87-33	-3.37-33	-5.47-33	-8.03-33	-1.06-32	-1.23-32	-1.18-32	-7.62-33	-3.48-34
20	0.00+00	3.57-36	-1.00-34	-3.57-34	-8.86-34	-1.80-33	-3.18-33	-4.88-33	-6.39-33	-6.30-33	-1.48-33	1.45-32	5.57-32	1.53-31
19	0.00+00	1.11-35	-8.86-35	-3.34-34	-8.32-34	-1.67-33	-2.81-33	-3.89-33	-3.71-33	8.03-34	1.71-32	6.31-32	1.85-31	5.22-31
18	0.00+00	2.16-35	-6.97-35	-2.90-34	-7.30-34	-1.42-33	-2.20-33	-2.28-33	6.15-34	1.26-32	4.99-32	1.57-31	4.77-31	1.56-30
17	0.00+00	3.60-35	-4.03-35	-2.19-34	-5.59-34	-1.02-33	-1.20-33	2.98-34	7.66-33	3.28-32	1.11-31	3.59-31	1.25-30	5.55-30
16	0.00+00	5.56-35	3.09-36	-1.07-34	-2.87-34	-3.68-34	3.90-34	4.45-33	1.94-32	6.92-32	2.36-31	8.64-31	4.02-30	3.79-29
15	0.00+00	8.18-35	6.47-35	5.83-35	1.32-34	6.54-34	2.94-33	1.13-32	4.02-32	1.41-31	5.35-31	2.57-30	2.47-29	
14	0.00+00	1.17-34	1.50-34	3.01-34	7.75-34	2.29-33	7.21-33	2.35-32	8.06-32	3.07-31	1.49-30	1.42-29		
13	0.00+00	1.63-34	2.69-34	6.59-34	1.79-33	5.04-33	1.49-32	4.75-32	1.73-31	8.13-31	7.35-30			
12	0.00+00	2.26-34	4.36-34	1.21-33	3.47-33	1.01-32	3.05-32	1.04-31	4.53-31	3.60-30				
11	0.00+00	3.15-34	6.86-34	2.10-33	6.58-33	2.06-32	6.95-32	2.84-31	1.92-30					
10	0.00+00	4.49-34	1.09-33	3.74-33	1.32-32	4.79-32	2.03-31	1.31-30						
9	0.00+00	6.67-34	1.82-33	7.22-33	3.06-32	1.48-31	1.11-30							
8	0.00+00	1.06-33	3.33-33	1.65-32	9.74-32	9.41-31								
7	0.00+00	1.85-33	7.25-33	5.23-32	6.83-31									
6	0.00+00	3.79-33	2.19-32	3.81-31										
5	0.00+00	1.04-32	1.51-31											
4	0.00+00	5.83-32												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-6.86-32	-9.80-32	-1.38-31	-1.92-31	-2.65-31	-3.62-31	-4.90-31	-6.58-31	-8.77-31	-1.16-30	-1.53-30	-2.01-30	-2.61-30	-3.38-30
45	-9.65-32	-1.40-31	-2.01-31	-2.85-31	-4.01-31	-5.59-31	-7.75-31	-1.07-30	-1.47-30	-2.01-30	-2.74-30	-3.73-30	-5.07-30	-6.88-30
40	-1.35-31	-2.00-31	-2.94-31	-4.29-31	-6.23-31	-9.00-31	-1.30-30	-1.86-30	-2.68-30	-3.87-30	-5.60-30	-8.14-30	-1.19-29	-1.76-29
35	-1.77-31	-2.72-31	-4.17-31	-6.37-31	-9.74-31	-1.49-30	-2.29-30	-3.56-30	-5.58-30	-8.89-30	-1.45-29	-2.42-29	-4.20-29	-7.65-29
30	-2.07-31	-3.39-31	-5.60-31	-9.34-31	-1.58-30	-2.72-30	-4.81-30	-8.62-30	-1.71-29	-3.55-29	-8.27-29	-2.30-28	-8.88-28	-7.57-27
29	-2.11-31	-3.53-31	-5.97-31	-1.02-30	-1.79-30	-3.20-30	-5.94-30	-1.16-29	-2.45-29	-5.76-29	-1.62-28	-6.33-28	-5.47-27	
28	-2.16-31	-3.69-31	-6.41-31	-1.14-30	-2.07-30	-3.89-30	-7.70-30	-1.64-29	-3.90-29	-1.11-28	-4.38-28	-3.84-27		
27	-2.20-31	-3.87-31	-6.96-31	-1.28-30	-2.46-30	-4.94-30	-1.07-29	-2.57-29	-7.39-29	-2.95-28	-2.61-27			
26	-2.24-31	-4.07-31	-7.64-31	-1.49-30	-3.04-30	-6.69-30	-1.63-29	-4.77-29	-1.93-28	-1.73-27				
25	-2.26-31	-4.28-31	-8.48-31	-1.77-30	-3.98-30	-9.93-30	-2.95-29	-1.21-28	-1.10-27					
24	-2.21-31	-4.43-31	-9.48-31	-2.19-30	-5.62-30	-1.72-29	-7.23-29	-6.71-28						
23	-2.02-31	-4.38-31	-1.05-30	-2.81-30	-8.95-30	-3.92-29	-3.77-28							
22	-1.46-31	-3.66-31	-1.07-30	-3.72-30	-1.77-29	-1.82-28								
21	-2.36-33	-8.19-32	-6.15-31	-4.41-30	-5.85-29									
20	3.85-31	9.88-31	2.91-30	1.29-29										
19	1.58-30	6.08-30	4.72-29											
18	6.55-30	5.64-29												
17	5.05-29													

H TE = 1.00+03 NE = 1.00+06 CASE B NC = 34

TOTAL RC = 1.809-12 4-2 RC = 2.195-13 4-2 EM = 8.969-25 2S RC = 4.814-13 2P RC = 1.328-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.59-03	1.41-03	6.06-04	3.14-04	1.83-04	1.16-04	7.80-05	5.50-05	4.02-05	3.03-05	2.34-05	1.84-05	1.48-05	1.20-05
45	6.31-03	1.94-03	8.32-04	4.31-04	2.51-04	1.59-04	1.07-04	7.55-05	5.52-05	4.15-05	3.21-05	2.52-05	2.02-05	1.65-05
40	8.90-03	2.73-03	1.17-03	6.08-04	3.54-04	2.24-04	1.51-04	1.06-04	7.78-05	5.86-05	4.52-05	3.56-05	2.85-05	2.32-05
35	1.28-02	3.92-03	1.69-03	8.73-04	5.09-04	3.22-04	2.17-04	1.53-04	1.12-04	8.40-05	6.48-05	5.10-05	4.09-05	3.32-05
30	1.78-02	5.46-03	2.35-03	1.22-03	7.10-04	4.49-04	3.02-04	2.13-04	1.56-04	1.17-04	9.04-05	7.11-05	5.70-05	4.63-05
29	1.89-02	5.79-03	2.49-03	1.29-03	7.52-04	4.76-04	3.20-04	2.26-04	1.65-04	1.24-04	9.57-05	7.53-05	6.03-05	4.91-05
28	1.99-02	6.09-03	2.62-03	1.36-03	7.92-04	5.02-04	3.37-04	2.38-04	1.74-04	1.31-04	1.01-04	7.94-05	6.36-05	5.17-05
27	2.08-02	6.38-03	2.74-03	1.42-03	8.30-04	5.25-04	3.54-04	2.49-04	1.82-04	1.37-04	1.06-04	8.31-05	6.66-05	5.41-05
26	2.16-02	6.65-03	2.86-03	1.48-03	8.64-04	5.47-04	3.68-04	2.60-04	1.90-04	1.43-04	1.10-04	8.66-05	6.94-05	5.64-05
25	2.24-02	6.89-03	2.96-03	1.54-03	8.96-04	5.68-04	3.82-04	2.69-04	1.97-04	1.48-04	1.14-04	8.99-05	7.20-05	5.85-05
24	2.32-02	7.12-03	3.06-03	1.59-03	9.27-04	5.88-04	3.96-04	2.79-04	2.04-04	1.53-04	1.18-04	9.31-05	7.45-05	6.05-05
23	2.40-02	7.37-03	3.17-03	1.64-03	9.61-04	6.09-04	4.10-04	2.89-04	2.11-04	1.59-04	1.23-04	9.65-05	7.72-05	6.27-05
22	2.49-02	7.66-03	3.30-03	1.71-03	1.00-03	6.35-04	4.27-04	3.01-04	2.20-04	1.66-04	1.28-04	1.01-04	8.05-05	6.53-05
21	2.61-02	8.03-03	3.46-03	1.80-03	1.05-03	6.67-04	4.50-04	3.17-04	2.32-04	1.75-04	1.35-04	1.06-04	8.48-05	6.87-05
20	2.76-02	8.50-03	3.67-03	1.91-03	1.12-03	7.10-04	4.79-04	3.38-04	2.48-04	1.86-04	1.44-04	1.13-04	9.04-05	7.31-05
19	2.95-02	9.11-03	3.94-03	2.05-03	1.20-03	7.67-04	5.18-04	3.66-04	2.68-04	2.02-04	1.56-04	1.22-04	9.77-05	7.89-05
18	3.19-02	9.88-03	4.29-03	2.24-03	1.32-03	8.39-04	5.68-04	4.02-04	2.95-04	2.22-04	1.71-04	1.35-04	1.07-04	8.61-05
17	3.47-02	1.08-02	4.71-03	2.47-03	1.46-03	9.32-04	6.32-04	4.48-04	3.29-04	2.49-04	1.92-04	1.50-04	1.19-04	9.43-05
16	3.81-02	1.19-02	5.23-03	2.76-03	1.64-03	1.05-03	7.16-04	5.09-04	3.75-04	2.83-04	2.18-04	1.71-04	1.33-04	9.97-05
15	4.19-02	1.33-02	5.87-03	3.12-03	1.87-03	1.21-03	8.26-04	5.90-04	4.35-04	3.29-04	2.53-04	1.96-04	1.45-04	
14	4.62-02	1.48-02	6.66-03	3.59-03	2.17-03	1.41-03	9.74-04	7.00-04	5.18-04	3.92-04	2.98-04	2.18-04		
13	5.08-02	1.67-02	7.65-03	4.20-03	2.57-03	1.70-03	1.18-03	8.54-04	6.34-04	4.75-04	3.44-04			
12	5.61-02	1.90-02	8.95-03	5.03-03	3.14-03	2.11-03	1.48-03	1.08-03	7.94-04	5.67-04				
11	6.24-02	2.19-02	1.08-02	6.24-03	3.99-03	2.72-03	1.93-03	1.40-03	9.82-04					
10	7.14-02	2.63-02	1.35-02	8.08-03	5.29-03	3.65-03	2.59-03	1.79-03						
9	8.59-02	3.31-02	1.78-02	1.10-02	7.38-03	5.12-03	3.47-03							
8	1.11-01	4.47-02	2.51-02	1.61-02	1.08-02	7.21-03								
7	1.57-01	6.59-02	3.85-02	2.51-02	1.64-02									
6	2.48-01	1.08-01	6.52-02	4.16-02										
5	4.50-01	2.04-01	1.24-01											
4	1.00+00	4.71-01												
3	3.19+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	9.90-06	8.26-06	6.96-06	5.92-06	5.08-06	4.39-06	3.82-06	3.34-06	2.94-06	2.60-06	2.31-06	2.06-06	1.85-06	1.66-06
45	1.36-05	1.13-05	9.55-06	8.12-06	6.96-06	6.01-06	5.23-06	4.58-06	4.03-06	3.56-06	3.16-06	2.82-06	2.53-06	2.27-06
40	1.91-05	1.59-05	1.34-05	1.14-05	9.79-06	8.46-06	7.35-06	6.43-06	5.65-06	5.00-06	4.44-06	3.95-06	3.54-06	3.18-06
35	2.74-05	2.28-05	1.92-05	1.63-05	1.40-05	1.21-05	1.05-05	9.16-06	8.05-06	7.10-06	6.29-06	5.60-06	4.99-06	4.46-06
30	3.82-05	3.18-05	2.68-05	2.27-05	1.94-05	1.67-05	1.45-05	1.26-05	1.11-05	9.70-06	8.52-06	7.45-06	6.44-06	5.26-06
29	4.04-05	3.37-05	2.83-05	2.40-05	2.05-05	1.77-05	1.53-05	1.33-05	1.16-05	1.02-05	8.86-06	7.62-06	6.20-06	
28	4.25-05	3.54-05	2.98-05	2.53-05	2.16-05	1.86-05	1.61-05	1.39-05	1.21-05	1.05-05	9.01-06	7.30-06		
27	4.45-05	3.71-05	3.12-05	2.64-05	2.26-05	1.94-05	1.67-05	1.45-05	1.25-05	1.06-05	8.59-06			
26	4.64-05	3.86-05	3.24-05	2.75-05	2.34-05	2.01-05	1.73-05	1.48-05	1.26-05	1.01-05				
25	4.81-05	4.00-05	3.36-05	2.84-05	2.42-05	2.06-05	1.76-05	1.49-05	1.19-05					
24	4.97-05	4.13-05	3.47-05	2.93-05	2.48-05	2.10-05	1.77-05	1.40-05						
23	5.15-05	4.28-05	3.58-05	3.01-05	2.53-05	2.11-05	1.67-05							
22	5.36-05	4.44-05	3.70-05	3.10-05	2.56-05	2.01-05								
21	5.63-05	4.65-05	3.85-05	3.17-05	2.47-05									
20	5.98-05	4.90-05	4.00-05	3.10-05										
19	6.41-05	5.17-05	3.98-05											
18	6.88-05	5.24-05												
17	7.12-05													

H TE = 1.00+03 NE = 1.00+06 CASE B NC = 34

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.14-35	-5.71-35	-1.80-34	-4.52-34	-9.84-34	-1.94-33	-3.53-33	-6.09-33	-1.00-32	-1.59-32	-2.45-32	-3.67-32	-5.36-32
45	0.00+00	-1.58-35	-7.89-35	-2.49-34	-6.29-34	-1.38-33	-2.72-33	-5.00-33	-8.69-33	-1.44-32	-2.32-32	-3.60-32	-5.45-32	-8.07-32
40	0.00+00	-2.23-35	-1.12-34	-3.56-34	-9.03-34	-1.99-33	-3.96-33	-7.35-33	-1.29-32	-2.17-32	-3.53-32	-5.57-32	-8.59-32	-1.30-31
35	0.00+00	-3.17-35	-1.62-34	-5.16-34	-1.32-33	-2.93-33	-5.91-33	-1.11-32	-1.98-32	-3.39-32	-5.63-32	-9.16-32	-1.44-31	-2.24-31
30	0.00+00	-4.19-35	-2.22-34	-7.17-34	-1.85-33	-4.17-33	-8.53-33	-1.63-32	-2.98-32	-5.25-32	-9.01-32	-1.51-31	-2.50-31	-4.09-31
29	0.00+00	-4.35-35	-2.33-34	-7.55-34	-1.96-33	-4.42-33	-9.07-33	-1.75-32	-3.20-32	-5.69-32	-9.84-32	-1.67-31	-2.79-31	-4.63-31
28	0.00+00	-4.45-35	-2.43-34	-7.90-34	-2.05-33	-4.64-33	-9.58-33	-1.85-32	-3.42-32	-6.12-32	-1.07-31	-1.84-31	-3.12-31	-5.25-31
27	0.00+00	-4.49-35	-2.50-34	-8.19-34	-2.13-33	-4.84-33	-1.00-32	-1.95-32	-3.62-32	-6.54-32	-1.15-31	-2.01-31	-3.46-31	-5.94-31
26	0.00+00	-4.45-35	-2.56-34	-8.46-34	-2.19-33	-4.99-33	-1.04-32	-2.03-32	-3.80-32	-6.92-32	-1.24-31	-2.19-31	-3.84-31	-6.74-31
25	0.00+00	-4.32-35	-2.58-34	-8.53-34	-2.23-33	-5.09-33	-1.06-32	-2.09-32	-3.94-32	-7.27-32	-1.32-31	-2.37-31	-4.25-31	-7.65-31
24	0.00+00	-4.11-35	-2.59-34	-8.59-34	-2.26-33	-5.15-33	-1.08-32	-2.13-32	-4.06-32	-7.58-32	-1.40-31	-2.56-31	-4.71-31	-8.75-31
23	0.00+00	-3.83-35	-2.57-34	-8.61-34	-2.26-33	-5.19-33	-1.09-32	-2.16-32	-4.16-32	-7.87-32	-1.48-31	-2.78-31	-5.26-31	-1.01-30
22	0.00+00	-3.48-35	-2.55-34	-8.62-34	-2.27-33	-5.21-33	-1.10-32	-2.19-32	-4.26-32	-8.18-32	-1.57-31	-3.04-31	-5.97-31	-1.20-30
21	0.00+00	-3.07-35	-2.54-34	-8.66-34	-2.29-33	-5.25-33	-1.11-32	-2.23-32	-4.37-32	-8.55-32	-1.69-31	-3.38-31	-6.95-31	-1.49-30
20	0.00+00	-2.61-35	-2.53-34	-8.75-34	-2.32-33	-5.33-33	-1.13-32	-2.28-32	-4.53-32	-9.05-32	-1.84-31	-3.86-31	-8.44-31	-1.97-30
19	0.00+00	-2.06-35	-2.54-34	-8.91-34	-2.37-33	-5.45-33	-1.15-32	-2.35-32	-4.73-32	-9.71-32	-2.06-31	-4.57-31	-1.09-30	-2.86-30
18	0.00+00	-1.37-35	-2.55-34	-9.11-34	-2.43-33	-5.61-33	-1.19-32	-2.43-32	-4.99-32	-1.06-31	-2.36-31	-5.69-31	-1.53-30	-4.86-30
17	0.00+00	-4.51-36	-2.54-34	-9.32-34	-2.51-33	-5.78-33	-1.23-32	-2.52-32	-5.24-32	-1.15-31	-2.77-31	-7.52-31	-2.45-30	-1.10-29
16	0.00+00	8.56-36	-2.47-34	-9.45-34	-2.56-33	-5.91-33	-1.25-32	-2.56-32	-5.39-32	-1.24-31	-3.29-31	-1.08-30	-4.97-30	-5.07-29
15	0.00+00	2.78-35	-2.30-34	-9.33-34	-2.56-33	-5.89-33	-1.22-32	-2.45-32	-5.07-32	-1.20-31	-3.69-31	-1.70-30	-1.82-29	
14	0.00+00	5.69-35	-1.91-34	-8.69-34	-2.43-33	-5.50-33	-1.08-32	-1.92-32	-3.21-32	-5.69-32	-1.70-31	-2.00-30		
13	0.00+00	1.01-34	-1.16-34	-7.05-34	-2.02-33	-4.29-33	-6.56-33	-2.38-33	4.25-32	3.53-31	4.12-30			
12	0.00+00	1.70-34	2.11-35	-3.58-34	-1.07-33	-1.29-33	4.91-33	5.15-32	3.85-31	4.78-30				
11	0.00+00	2.75-34	2.60-34	3.23-34	1.00-33	6.01-33	3.78-32	2.66-31	3.38-30					
10	0.00+00	4.38-34	6.70-34	1.66-33	5.70-33	2.59-32	1.60-31	1.92-30						
9	0.00+00	6.96-34	1.40-33	4.49-33	1.81-32	9.86-32	1.05-30							
8	0.00+00	1.14-33	2.86-33	1.17-32	6.41-32	6.48-31								
7	0.00+00	2.01-33	6.44-33	3.86-32	4.45-31									
6	0.00+00	4.09-33	1.93-32	2.73-31										
5	0.00+00	1.11-32	1.27-31											
4	0.00+00	6.02-32												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-7.66-32	-1.07-31	-1.48-31	-2.00-31	-2.66-31	-3.47-31	-4.43-31	-5.54-31	-6.78-31	-8.12-31	-9.54-31	-1.10-30	-1.25-30	-1.41-30
45	-1.17-31	-1.67-31	-2.34-31	-3.23-31	-4.38-31	-5.84-31	-7.66-31	-9.85-31	-1.24-30	-1.54-30	-1.88-30	-2.26-30	-2.70-30	-3.20-30
40	-1.92-31	-2.80-31	-4.03-31	-5.72-31	-8.02-31	-1.11-30	-1.51-30	-2.03-30	-2.69-30	-3.53-30	-4.58-30	-5.91-30	-7.64-30	-9.92-30
35	-3.43-31	-5.19-31	-7.79-31	-1.16-30	-1.71-30	-2.51-30	-3.67-30	-5.33-30	-7.72-30	-1.12-29	-1.64-29	-2.44-29	-3.74-29	-6.01-29
30	-6.63-31	-1.07-30	-1.74-30	-2.82-30	-4.61-30	-7.64-30	-1.29-29	-2.22-29	-3.98-29	-7.57-29	-1.59-28	-3.93-28	-1.34-27	-1.01-26
29	-7.64-31	-1.26-30	-2.08-30	-3.48-30	-5.89-30	-1.01-29	-1.80-29	-3.30-29	-6.46-29	-1.39-28	-3.52-28	-1.23-27	-9.36-27	
28	-8.82-31	-1.49-30	-2.53-30	-4.36-30	-7.68-30	-1.39-29	-2.63-29	-5.27-29	-1.17-28	-3.03-28	-1.08-27	-8.43-27		
27	-1.02-30	-1.77-30	-3.11-30	-5.58-30	-1.03-29	-2.00-29	-4.11-29	-9.33-29	-2.50-28	-9.14-28	-7.29-27			
26	-1.19-30	-2.12-30	-3.88-30	-7.32-30	-1.45-29	-3.05-29	-7.10-29	-1.95-28	-7.35-28	-6.03-27				
25	-1.39-30	-2.59-30	-4.97-30	-9.99-30	-2.15-29	-5.13-29	-1.45-28	-5.61-28	-4.73-27					
24	-1.65-30	-3.23-30	-6.60-30	-1.44-29	-3.52-29	-1.02-28	-4.04-28	-3.51-27						
23	-2.01-30	-4.18-30	-9.29-30	-2.30-29	-6.77-29	-2.75-28	-2.46-27							
22	-2.54-30	-5.74-30	-1.44-29	-4.31-29	-1.79-28	-1.63-27								
21	-3.42-30	-8.72-30	-2.64-29	-1.11-28	-1.03-27									
20	-5.09-30	-1.57-29	-6.66-29	-6.26-28										
19	-8.94-30	-3.86-29	-3.67-28											
18	-2.14-29	-2.06-28												
17	-1.09-28													

H TE = 1.00+03 NE = 1.00+07 CASE B NC = 21

TOTAL RC = 2.106-12 4-2 RC = 2.582-13 4-2 EM = 1.055-24 2S RC = 5.887-13 2P RC = 1.517-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.96-03	1.21-03	5.22-04	2.70-04	1.58-04	9.99-05	6.72-05	4.74-05	3.46-05	2.61-05	2.01-05	1.59-05	1.27-05	1.03-05
45	5.50-03	1.69-03	7.25-04	3.75-04	2.19-04	1.39-04	9.33-05	6.58-05	4.81-05	3.62-05	2.79-05	2.20-05	1.76-05	1.43-05
40	7.94-03	2.44-03	1.05-03	5.42-04	3.16-04	2.00-04	1.35-04	9.50-05	6.94-05	5.23-05	4.03-05	3.18-05	2.54-05	2.07-05
35	1.21-02	3.70-03	1.59-03	8.23-04	4.80-04	3.04-04	2.04-04	1.44-04	1.05-04	7.92-05	6.11-05	4.81-05	3.85-05	3.13-05
30	1.93-02	5.92-03	2.54-03	1.32-03	7.67-04	4.86-04	3.27-04	2.30-04	1.68-04	1.26-04	9.75-05	7.67-05	6.14-05	4.99-05
29	2.13-02	6.54-03	2.81-03	1.45-03	8.47-04	5.36-04	3.61-04	2.54-04	1.86-04	1.40-04	1.08-04	8.46-05	6.78-05	5.51-05
28	2.36-02	7.23-03	3.10-03	1.61-03	9.37-04	5.93-04	3.99-04	2.81-04	2.05-04	1.54-04	1.19-04	9.35-05	7.48-05	6.08-05
27	2.61-02	7.99-03	3.43-03	1.78-03	1.04-03	6.56-04	4.41-04	3.10-04	2.27-04	1.70-04	1.31-04	1.03-04	8.27-05	6.71-05
26	2.88-02	8.84-03	3.80-03	1.96-03	1.14-03	7.25-04	4.87-04	3.43-04	2.50-04	1.88-04	1.45-04	1.14-04	9.12-05	7.41-05
25	3.18-02	9.75-03	4.19-03	2.17-03	1.26-03	7.99-04	5.37-04	3.78-04	2.76-04	2.07-04	1.60-04	1.26-04	1.00-04	8.15-05
24	3.49-02	1.07-02	4.60-03	2.38-03	1.39-03	8.78-04	5.90-04	4.15-04	3.03-04	2.28-04	1.75-04	1.38-04	1.10-04	8.93-05
23	3.82-02	1.17-02	5.02-03	2.60-03	1.51-03	9.58-04	6.44-04	4.53-04	3.30-04	2.48-04	1.91-04	1.50-04	1.20-04	9.72-05
22	4.13-02	1.27-02	5.44-03	2.81-03	1.64-03	1.04-03	6.96-04	4.90-04	3.57-04	2.68-04	2.06-04	1.62-04	1.29-04	1.05-04
21	4.38-02	1.34-02	5.77-03	2.99-03	1.74-03	1.10-03	7.41-04	5.21-04	3.80-04	2.86-04	2.20-04	1.72-04	1.38-04	1.11-04
20	4.63-02	1.42-02	6.10-03	3.16-03	1.84-03	1.16-03	7.82-04	5.50-04	4.01-04	3.01-04	2.32-04	1.82-04	1.45-04	1.17-04
19	4.82-02	1.48-02	6.35-03	3.29-03	1.92-03	1.21-03	8.15-04	5.73-04	4.18-04	3.14-04	2.41-04	1.89-04	1.50-04	1.21-04
18	4.98-02	1.53-02	6.57-03	3.40-03	1.98-03	1.25-03	8.43-04	5.92-04	4.32-04	3.24-04	2.48-04	1.94-04	1.54-04	1.23-04
17	5.15-02	1.58-02	6.79-03	3.52-03	2.05-03	1.30-03	8.72-04	6.13-04	4.47-04	3.35-04	2.56-04	2.00-04	1.57-04	1.23-04
16	5.38-02	1.65-02	7.11-03	3.68-03	2.15-03	1.36-03	9.14-04	6.42-04	4.67-04	3.50-04	2.67-04	2.07-04	1.60-04	1.18-04
15	5.72-02	1.76-02	7.58-03	3.93-03	2.30-03	1.45-03	9.77-04	6.87-04	4.99-04	3.72-04	2.83-04	2.19-04	1.57-04	
14	6.22-02	1.92-02	8.28-03	4.30-03	2.52-03	1.59-03	1.07-03	7.53-04	5.46-04	4.05-04	3.03-04	2.18-04		
13	6.90-02	2.14-02	9.25-03	4.82-03	2.83-03	1.80-03	1.21-03	8.48-04	6.12-04	4.48-04	3.16-04			
12	7.81-02	2.43-02	1.06-02	5.55-03	3.27-03	2.08-03	1.40-03	9.82-04	7.01-04	4.85-04				
11	8.96-02	2.82-02	1.24-02	6.57-03	3.89-03	2.49-03	1.68-03	1.17-03	7.91-04					
10	1.04-01	3.33-02	1.50-02	8.03-03	4.82-03	3.11-03	2.09-03	1.38-03						
9	1.23-01	4.05-02	1.87-02	1.03-02	6.28-03	4.07-03	2.63-03							
8	1.49-01	5.13-02	2.47-02	1.41-02	8.72-03	5.47-03								
7	1.92-01	6.98-02	3.55-02	2.09-02	1.27-02									
6	2.77-01	1.07-01	5.70-02	3.31-02										
5	4.70-01	1.90-01	1.02-01											
4	1.00+00	4.09-01												
3	3.01+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.53-06	7.12-06	6.00-06	5.16-06	4.38-06	3.78-06	3.29-06	2.88-06	2.53-06	2.24-06	1.99-06	1.78-06	1.59-06	1.43-06
45	1.18-05	9.87-06	8.32-06	7.07-06	6.07-06	5.24-06	4.56-06	3.99-06	3.51-06	3.10-06	2.76-06	2.46-06	2.20-06	1.98-06
40	1.71-05	1.42-05	1.20-05	1.02-05	8.74-06	7.55-06	6.56-06	5.74-06	5.05-06	4.46-06	3.96-06	3.53-06	3.16-06	2.84-06
35	2.58-05	2.15-05	1.81-05	1.54-05	1.32-05	1.14-05	9.89-06	8.64-06	7.59-06	6.70-06	5.93-06	5.28-06	4.71-06	4.21-06
30	4.11-05	3.42-05	2.88-05	2.44-05	2.09-05	1.80-05	1.56-05	1.36-05	1.19-05	1.04-05	9.14-06	7.99-06	6.90-06	5.63-06
29	4.53-05	3.78-05	3.17-05	2.69-05	2.30-05	1.98-05	1.71-05	1.49-05	1.30-05	1.14-05	9.89-06	8.50-06	6.91-06	
28	5.00-05	4.17-05	3.50-05	2.97-05	2.54-05	2.18-05	1.88-05	1.63-05	1.42-05	1.23-05	1.05-05	8.52-06		
27	5.52-05	4.60-05	3.86-05	3.27-05	2.79-05	2.40-05	2.06-05	1.78-05	1.54-05	1.31-05	1.06-05			
26	6.09-05	5.06-05	4.25-05	3.60-05	3.06-05	2.62-05	2.25-05	1.93-05	1.64-05	1.31-05				
25	6.70-05	5.57-05	4.67-05	3.94-05	3.35-05	2.86-05	2.44-05	2.05-05	1.64-05					
24	7.33-05	6.09-05	5.10-05	4.30-05	3.64-05	3.08-05	2.58-05	2.04-05						
23	7.97-05	6.61-05	5.52-05	4.63-05	3.89-05	3.24-05	2.55-05							
22	8.58-05	7.09-05	5.90-05	4.91-05	4.06-05	3.18-05								
21	9.09-05	7.49-05	6.19-05	5.08-05	3.95-05									
20	9.51-05	7.78-05	6.32-05	4.88-05										
19	9.75-05	7.85-05	6.00-05											
18	9.77-05	7.40-05												
17	9.25-05													

H TE = 1.00+03 NE = 1.00+07 CASE B NC = 21

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.08-35	-5.68-35	-1.81-34	-4.56-34	-9.94-34	-1.96-33	-3.56-33	-6.10-33	-9.92-33	-1.55-32	-2.31-32	-3.34-32	-4.64-32
45	0.00+00	-1.52-35	-7.96-35	-2.54-34	-6.44-34	-1.41-33	-2.79-33	-5.12-33	-8.84-33	-1.45-32	-2.28-32	-3.46-32	-5.06-32	-7.12-32
40	0.00+00	-2.23-35	-1.16-34	-3.73-34	-9.51-34	-2.10-33	-4.19-33	-7.77-33	-1.36-32	-2.26-32	-3.60-32	-5.55-32	-8.26-32	-1.19-31
35	0.00+00	-3.43-35	-1.79-34	-5.79-34	-1.49-33	-3.32-33	-6.72-33	-1.26-32	-2.24-32	-3.80-32	-6.21-32	-9.80-32	-1.50-31	-2.23-31
30	0.00+00	-5.57-35	-2.93-34	-9.56-34	-2.49-33	-5.65-33	-1.17-32	-2.24-32	-4.09-32	-7.15-32	-1.21-31	-1.99-31	-3.20-31	-5.01-31
29	0.00+00	-6.16-35	-3.25-34	-1.06-33	-2.78-33	-6.34-33	-1.31-32	-2.54-32	-4.67-32	-8.24-32	-1.41-31	-2.34-31	-3.81-31	-6.07-31
28	0.00+00	-6.82-35	-3.61-34	-1.18-33	-3.11-33	-7.13-33	-1.49-32	-2.90-32	-5.36-32	-9.55-32	-1.69-31	-2.78-31	-4.59-31	-7.44-31
27	0.00+00	-7.55-35	-4.02-34	-1.32-33	-3.49-33	-8.03-33	-1.68-32	-3.31-32	-6.18-32	-1.11-31	-1.95-31	-3.33-31	-5.59-31	-9.24-31
26	0.00+00	-8.33-35	-4.46-34	-1.47-33	-3.90-33	-9.04-33	-1.91-32	-3.78-32	-7.14-32	-1.30-31	-2.31-31	-4.02-31	-6.88-31	-1.17-30
25	0.00+00	-9.14-35	-4.93-34	-1.64-33	-4.37-33	-1.02-32	-2.17-32	-4.33-32	-8.28-32	-1.53-31	-2.76-31	-4.89-31	-8.58-31	-1.49-30
24	0.00+00	-9.95-35	-5.43-34	-1.81-33	-4.86-33	-1.14-32	-2.45-32	-4.96-32	-9.60-32	-1.80-31	-3.31-31	-6.01-31	-1.08-30	-1.95-30
23	0.00+00	-1.07-34	-5.93-34	-1.99-33	-5.38-33	-1.27-32	-2.76-32	-5.66-32	-1.11-31	-2.13-31	-4.00-31	-7.45-31	-1.39-30	-2.61-30
22	0.00+00	-1.13-34	-6.40-34	-2.17-33	-5.89-33	-1.41-32	-3.09-32	-6.41-32	-1.28-31	-2.51-31	-4.84-31	-9.32-31	-1.81-30	-3.58-30
21	0.00+00	-1.15-34	-6.71-34	-2.29-33	-6.30-33	-1.52-32	-3.38-32	-7.15-32	-1.46-31	-2.93-31	-5.84-31	-1.17-30	-2.39-30	-5.06-30
20	0.00+00	-1.14-34	-6.97-34	-2.41-33	-6.68-33	-1.63-32	-3.68-32	-7.93-32	-1.66-31	-3.43-31	-7.11-31	-1.50-30	-3.27-30	-7.56-30
19	0.00+00	-1.09-34	-7.08-34	-2.48-33	-6.95-33	-1.72-32	-3.95-32	-8.69-32	-1.87-31	-4.02-31	-8.74-31	-1.96-30	-4.67-30	-1.22-29
18	0.00+00	-9.84-35	-7.04-34	-2.51-33	-7.11-33	-1.78-32	-4.18-32	-9.44-32	-2.11-31	-4.73-31	-1.09-30	-2.68-30	-7.21-30	-2.29-29
17	0.00+00	-8.34-35	-6.90-34	-2.51-33	-7.22-33	-1.84-32	-4.40-32	-1.03-31	-2.39-31	-5.71-31	-1.43-30	-3.96-30	-1.29-29	-5.77-29
16	0.00+00	-6.47-35	-6.74-34	-2.52-33	-7.36-33	-1.91-32	-4.70-32	-1.14-31	-2.81-31	-7.26-31	-2.05-30	-6.82-30	-3.12-29	-3.13-28
15	0.00+00	-4.22-35	-6.61-34	-2.56-33	-7.61-33	-2.02-32	-5.14-32	-1.31-31	-3.50-31	-1.01-30	-3.45-30	-1.60-29	-1.64-28	
14	0.00+00	-1.39-35	-6.54-34	-2.64-33	-8.06-33	-2.20-32	-5.85-32	-1.61-31	-4.78-31	-1.66-30	-7.89-30	-8.19-29		
13	0.00+00	2.44-35	-6.46-34	-2.77-33	-8.71-33	-2.47-32	-6.97-32	-2.12-31	-7.56-31	-3.67-30	-3.88-29			
12	0.00+00	8.11-35	-6.23-34	-2.91-33	-9.56-33	-2.84-32	-8.76-32	-3.14-31	-1.55-30	-1.67-29				
11	0.00+00	1.72-34	-5.51-34	-3.00-33	-1.04-32	-3.30-32	-1.15-31	-5.54-31	-5.98-30					
10	0.00+00	3.26-34	-3.56-34	-2.80-33	-1.06-32	-3.57-32	-1.46-31	-1.34-30						
9	0.00+00	6.04-34	1.33-34	-1.69-33	-7.03-33	-1.37-32	1.66-31							
8	0.00+00	1.13-33	1.34-33	2.52-33	1.75-32	3.75-31								
7	0.00+00	2.18-33	4.57-33	2.08-32	2.80-31									
6	0.00+00	4.64-33	1.60-32	1.84-31										
5	0.00+00	1.26-32	1.05-31											
4	0.00+00	6.60-32												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-6.17-32	-7.81-32	-9.36-32	-1.05-31	-1.11-31	-1.08-31	-9.43-32	-7.10-32	-3.62-32	1.13-32	7.33-32	1.53-31	2.54-31	3.83-31
45	-9.63-32	-1.24-31	-1.52-31	-1.76-31	-1.91-31	-1.95-31	-1.81-31	-1.52-31	-1.03-31	-2.99-32	7.18-32	2.11-31	4.00-31	6.57-31
40	-1.65-31	-2.18-31	-2.76-31	-3.31-31	-3.77-31	-4.07-31	-4.10-31	-3.88-31	-3.28-31	-2.20-31	-4.62-32	2.25-31	6.42-31	1.29-30
35	-3.21-31	-4.44-31	-5.89-31	-7.49-31	-9.13-31	-1.07-30	-1.21-30	-1.32-30	-1.38-30	-1.37-30	-1.20-30	-7.48-31	2.91-31	2.64-30
30	-7.67-31	-1.14-30	-1.65-30	-2.32-30	-3.19-30	-4.33-30	-5.86-30	-8.03-30	-1.13-29	-1.69-29	-2.74-29	-5.13-29	-1.27-28	-6.40-28
29	-9.45-31	-1.44-30	-2.13-30	-3.08-30	-4.40-30	-6.25-30	-8.95-30	-1.32-29	-2.06-29	-3.52-29	-7.10-29	-1.94-28	-1.15-27	
28	-1.18-30	-1.84-30	-2.81-30	-4.22-30	-6.28-30	-9.43-30	-1.45-29	-2.35-29	-4.20-29	-8.83-29	-2.56-28	-1.61-27		
27	-1.51-30	-2.41-30	-3.81-30	-5.97-30	-9.38-30	-1.51-29	-2.55-29	-4.71-29	-1.03-28	-3.08-28	-2.04-27			
26	-1.95-30	-3.24-30	-5.34-30	-8.82-30	-1.48-29	-2.61-29	-5.02-29	-1.13-28	-3.51-28	-2.38-27				
25	-2.59-30	-4.49-30	-7.79-30	-1.38-29	-2.53-29	-5.07-29	-1.19-28	-3.80-28	-2.66-27					
24	-3.53-30	-6.44-30	-1.20-29	-2.31-29	-4.82-29	-1.17-28	-3.90-28	-2.81-27						
23	-4.97-30	-9.69-30	-1.97-29	-4.31-29	-1.09-28	-3.74-28	-2.83-27							
22	-7.28-30	-1.55-29	-3.58-29	-9.51-29	-3.39-28	-2.57-27								
21	-1.13-29	-2.73-29	-7.65-29	-2.88-28	-2.31-27									
20	-1.91-29	-5.63-29	-2.23-28	-1.89-27										
19	-3.76-29	-1.57-28	-1.40-27											
18	-9.95-29	-9.34-28												
17	-5.63-28													

H TE = 1.00+03 NE = 1.00+08 CASE B NC = 20

TOTAL RC = 2.717-12 4-2 RC = 3.427-13 4-2 EM = 1.401-24 2S RC = 7.959-13 2P RC = 1.921-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.99-03	9.17-04	3.94-04	2.04-04	1.19-04	7.54-05	5.07-05	3.58-05	2.61-05	1.97-05	1.52-05	1.20-05	9.59-06	7. -06
45	4.16-03	1.28-03	5.48-04	2.84-04	1.66-04	1.05-04	7.06-05	4.97-05	3.64-05	2.74-05	2.11-05	1.66-05	1.33-05	1.09-05
40	6.04-03	1.85-03	7.96-04	4.12-04	2.40-04	1.52-04	1.02-04	7.22-05	5.28-05	3.97-05	3.06-05	2.41-05	1.93-05	1.57-05
35	9.26-03	2.84-03	1.22-03	6.32-04	3.69-04	2.34-04	1.57-04	1.11-04	8.09-05	6.09-05	4.69-05	3.70-05	2.96-05	2.41-05
30	1.53-02	4.69-03	2.02-03	1.04-03	6.09-04	3.85-04	2.59-04	1.82-04	1.33-04	1.00-04	7.73-05	6.08-05	4.87-05	3.96-05
29	1.71-02	5.24-03	2.25-03	1.17-03	6.80-04	4.30-04	2.89-04	2.04-04	1.49-04	1.12-04	8.63-05	6.79-05	5.44-05	4.42-05
28	1.92-02	5.88-03	2.53-03	1.31-03	7.63-04	4.83-04	3.25-04	2.29-04	1.67-04	1.26-04	9.68-05	7.61-05	6.09-05	4.95-05
27	2.16-02	6.63-03	2.85-03	1.47-03	8.59-04	5.44-04	3.66-04	2.57-04	1.88-04	1.41-04	1.09-04	8.57-05	6.86-05	5.57-05
26	2.45-02	7.51-03	3.22-03	1.67-03	9.73-04	6.16-04	4.14-04	2.91-04	2.13-04	1.60-04	1.23-04	9.69-05	7.75-05	6.29-05
25	2.78-02	8.54-03	3.67-03	1.90-03	1.11-03	7.00-04	4.70-04	3.31-04	2.42-04	1.82-04	1.40-04	1.10-04	8.79-05	7.14-05
24	3.18-02	9.75-03	4.19-03	2.17-03	1.26-03	7.99-04	5.37-04	3.78-04	2.76-04	2.07-04	1.60-04	1.25-04	1.00-04	8.13-05
23	3.65-02	1.12-02	4.80-03	2.48-03	1.45-03	9.15-04	6.15-04	4.33-04	3.16-04	2.37-04	1.83-04	1.43-04	1.15-04	9.29-05
22	4.20-02	1.29-02	5.52-03	2.86-03	1.66-03	1.05-03	7.07-04	4.97-04	3.63-04	2.73-04	2.10-04	1.65-04	1.31-04	1.06-04
21	4.84-02	1.48-02	6.37-03	3.30-03	1.92-03	1.21-03	8.15-04	5.73-04	4.18-04	3.14-04	2.41-04	1.89-04	1.51-04	1.22-04
20	5.57-02	1.71-02	7.33-03	3.79-03	2.21-03	1.40-03	9.38-04	6.59-04	4.81-04	3.61-04	2.77-04	2.17-04	1.73-04	1.39-04
19	6.41-02	1.96-02	8.43-03	4.36-03	2.54-03	1.61-03	1.08-03	7.57-04	5.52-04	4.14-04	3.17-04	2.48-04	1.97-04	1.58-04
18	7.31-02	2.24-02	9.62-03	4.97-03	2.90-03	1.83-03	1.23-03	8.62-04	6.28-04	4.70-04	3.60-04	2.81-04	2.23-04	1.77-04
17	8.22-02	2.52-02	1.08-02	5.59-03	3.25-03	2.05-03	1.38-03	9.67-04	7.03-04	5.26-04	4.02-04	3.13-04	2.46-04	1.93-04
16	9.03-02	2.77-02	1.19-02	6.14-03	3.57-03	2.25-03	1.51-03	1.06-03	7.69-04	5.74-04	4.37-04	3.38-04	2.61-04	1.92-04
15	9.64-02	2.95-02	1.27-02	6.55-03	3.81-03	2.40-03	1.61-03	1.13-03	8.16-04	6.07-04	4.59-04	3.48-04	2.53-04	
14	1.00-01	3.07-02	1.32-02	6.79-03	3.95-03	2.49-03	1.67-03	1.16-03	8.40-04	6.21-04	4.62-04	3.30-04		
13	1.03-01	3.15-02	1.35-02	6.98-03	4.05-03	2.55-03	1.71-03	1.19-03	8.52-04	6.19-04	4.34-04			
12	1.07-01	3.28-02	1.41-02	7.28-03	4.23-03	2.66-03	1.77-03	1.22-03	8.65-04	5.92-04				
11	1.16-01	3.55-02	1.52-02	7.88-03	4.57-03	2.87-03	1.90-03	1.29-03	8.62-04					
10	1.30-01	4.01-02	1.73-02	8.92-03	5.18-03	3.24-03	2.11-03	1.36-03						
9	1.53-01	4.74-02	2.05-02	1.06-02	6.15-03	3.81-03	2.36-03							
8	1.88-01	5.87-02	2.56-02	1.33-02	7.70-03	4.54-03								
7	2.41-01	7.66-02	3.41-02	1.79-02	9.99-03									
6	3.29-01	1.08-01	4.98-02	2.58-02										
5	5.12-01	1.76-01	8.16-02											
4	1.00+00	3.44-01												
3	2.78+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.44-06	5.37-06	4.53-06	3.85-06	3.30-06	2.85-06	2.48-06	2.17-06	1.91-06	1.69-06	1.50-06	1.34-06	1.20-06	1.08-06
45	8.95-06	7.47-06	6.29-06	5.35-06	4.59-06	3.96-06	3.45-06	3.02-06	2.65-06	2.35-06	2.08-06	1.86-06	1.67-06	1.50-06
40	1.30-05	1.08-05	9.11-06	7.75-06	6.64-06	5.74-06	4.99-06	4.36-06	3.83-06	3.39-06	3.01-06	2.68-06	2.40-06	2.16-06
35	1.98-05	1.65-05	1.39-05	1.18-05	1.01-05	8.75-06	7.60-06	6.64-06	5.83-06	5.15-06	4.56-06	4.06-06	3.62-06	3.23-06
30	3.26-05	2.72-05	2.28-05	1.94-05	1.66-05	1.43-05	1.24-05	1.08-05	9.42-06	8.26-06	7.25-06	6.34-06	5.47-06	4.46-06
29	3.64-05	3.03-05	2.55-05	2.16-05	1.85-05	1.59-05	1.38-05	1.20-05	1.04-05	9.11-06	7.94-06	6.82-06	5.54-06	
28	4.08-05	3.39-05	2.85-05	2.42-05	2.06-05	1.77-05	1.53-05	1.33-05	1.16-05	1.00-05	8.57-06	6.94-06		
27	4.58-05	3.81-05	3.20-05	2.71-05	2.32-05	1.99-05	1.71-05	1.48-05	1.28-05	1.09-05	8.75-06			
26	5.17-05	4.30-05	3.61-05	3.06-05	2.60-05	2.23-05	1.91-05	1.64-05	1.39-05	1.11-05				
25	5.87-05	4.87-05	4.09-05	3.45-05	2.93-05	2.50-05	2.13-05	1.80-05	1.43-05					
24	6.67-05	5.54-05	4.64-05	3.91-05	3.31-05	2.80-05	2.35-05	1.86-05						
23	7.62-05	6.31-05	5.27-05	4.43-05	3.72-05	3.09-05	2.44-05							
22	8.71-05	7.20-05	5.99-05	4.99-05	4.12-05	3.23-05								
21	9.96-05	8.20-05	6.77-05	5.55-05	4.31-05									
20	1.13-04	9.27-05	7.53-05	5.80-05										
19	1.28-04	1.03-04	7.86-05											
18	1.41-04	1.07-04												
17	1.44-04													

H TE = 1.00+03 NE = 1.00+08 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.89-29	9.66-36	-5.46-35	-1.74-34	-4.37-34	-9.40-34	-1.81-33	-3.20-33	-5.24-33	-7.93-33	-1.09-32	-1.33-32	-1.34-32	-9.41-33
45	6.72-29	-1.36-35	-7.68-35	-2.46-34	-6.18-34	-1.34-33	-2.60-33	-4.63-33	-7.64-33	-1.17-32	-1.64-32	-2.03-32	-2.11-32	-1.59-32
40	9.58-29	-2.01-35	-1.13-34	-3.64-34	-9.20-34	-2.01-33	-3.93-33	-7.08-33	-1.18-32	-1.84-32	-2.63-32	-3.34-32	-3.61-32	-2.97-32
35	1.43-28	-3.17-35	-1.77-34	-5.73-34	-1.46-33	-3.23-33	-6.41-33	-1.17-32	-2.00-32	-3.18-32	-4.67-32	-6.17-32	-7.05-32	-6.44-32
30	2.29-28	-5.42-35	-3.01-34	-9.84-34	-2.55-33	-5.73-33	-1.16-32	-2.18-32	-3.83-32	-6.31-32	-9.69-32	-1.36-31	-1.68-31	-1.76-31
29	2.54-28	-6.11-35	-3.39-34	-1.11-33	-2.89-33	-6.52-33	-1.33-32	-2.52-32	-4.45-32	-7.41-32	-1.15-31	-1.64-31	-2.07-31	-2.24-31
28	2.82-28	-6.92-35	-3.84-34	-1.26-33	-3.29-33	-7.47-33	-1.53-32	-2.92-32	-5.22-32	-8.78-32	-1.38-31	-2.00-31	-2.59-31	-2.90-31
27	3.15-28	-7.87-35	-4.36-34	-1.44-33	-3.77-33	-8.61-33	-1.78-32	-3.42-32	-6.18-32	-1.05-31	-1.68-31	-2.48-31	-3.29-31	-3.82-31
26	3.54-28	-9.00-35	-4.99-34	-1.65-33	-4.35-33	-1.00-32	-2.09-32	-4.04-32	-7.38-32	-1.28-31	-2.07-31	-3.12-31	-4.26-31	-5.16-31
25	3.98-28	-1.03-34	-5.73-34	-1.90-33	-5.05-33	-1.17-32	-2.46-32	-4.82-32	-8.92-32	-1.57-31	-2.59-31	-4.00-31	-5.65-31	-7.15-31
24	4.51-28	-1.19-34	-6.62-34	-2.21-33	-5.91-33	-1.38-32	-2.93-32	-5.82-32	-1.09-31	-1.95-31	-3.31-31	-5.25-31	-7.68-31	-1.02-30
23	5.14-28	-1.38-34	-7.69-34	-2.58-33	-6.95-33	-1.64-32	-3.52-32	-7.09-32	-1.35-31	-2.47-31	-4.30-31	-7.05-31	-1.08-30	-1.52-30
22	5.89-28	-1.61-34	-8.96-34	-3.03-33	-8.23-33	-1.96-32	-4.27-32	-8.74-32	-1.70-31	-3.19-31	-5.71-31	-9.74-31	-1.56-30	-2.36-30
21	6.79-28	-1.88-34	-1.05-33	-3.57-33	-9.80-33	-2.36-32	-5.23-32	-1.09-31	-2.18-31	-4.20-31	-7.80-31	-1.39-30	-2.38-30	-3.89-30
20	7.89-28	-2.17-34	-1.22-33	-4.21-33	-1.17-32	-2.86-32	-6.45-32	-1.38-31	-2.82-31	-5.63-31	-1.09-30	-2.07-30	-3.81-30	-6.91-30
19	9.24-28	-2.51-34	-1.43-33	-4.96-33	-1.40-32	-3.48-32	-8.01-32	-1.76-31	-3.73-31	-7.76-31	-1.60-30	-3.24-30	-6.58-30	-1.37-29
18	1.09-27	-2.85-34	-1.65-33	-5.81-33	-1.66-32	-4.22-32	-9.98-32	-2.26-31	-5.00-31	-1.10-30	-2.42-30	-5.43-30	-1.26-29	-3.24-29
17	1.30-27	-3.15-34	-1.88-33	-6.71-33	-1.95-32	-5.09-32	-1.24-31	-2.92-31	-6.82-31	-1.60-30	-3.89-30	-9.95-30	-2.84-29	-1.04-28
16	1.57-27	-3.33-34	-2.07-33	-7.96-33	-2.25-32	-6.03-32	-1.53-31	-3.78-31	-9.43-31	-2.43-30	-6.73-30	-2.11-29	-8.60-29	-7.22-28
15	1.93-27	-3.29-34	-2.20-33	-8.23-33	-2.52-32	-6.98-32	-1.85-31	-4.89-31	-1.33-30	-3.91-30	-1.32-29	-5.91-29	-5.49-28	
14	2.39-27	-2.95-34	-2.23-33	-8.63-33	-2.72-32	-7.89-32	-2.22-31	-6.19-31	-1.97-30	-7.04-30	-3.38-29	-3.44-28		
13	3.03-27	-2.33-34	-2.19-33	-8.85-33	-2.91-32	-8.86-32	-2.71-31	-8.77-31	-3.27-30	-1.65-29	-1.79-28			
12	3.91-27	-1.46-34	-2.13-33	-9.12-33	-3.16-32	-1.00-31	-3.54-31	-1.30-30	-4.19-30	-8.12-29				
11	5.19-27	-3.30-35	-2.11-33	-9.75-33	-3.62-32	-1.32-31	-5.38-31	-2.91-30	-3.38-29					
10	7.09-27	1.29-34	-2.12-33	-1.10-32	-4.53-32	-1.96-31	-1.10-30	-1.32-29						
9	1.01-26	3.94-34	-2.13-33	-1.33-32	-6.42-32	-3.79-31	-4.67-30							
8	1.52-26	8.96-34	-1.94-33	-1.69-32	-1.10-31	-1.36-30								
7	2.45-26	1.99-33	-7.23-34	-2.06-32	-2.52-31									
6	4.40-26	4.82-33	5.97-33	2.46-32										
5	9.41-26	1.43-32	6.89-32											
4	2.81-25	7.60-32												
3	2.04-24													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.84-34	1.45-32	3.44-32	5.96-32	9.01-32	1.27-31	1.71-31	2.23-31	2.86-31	3.62-31	4.55-31	5.67-31	7.06-31	8.78-31
45	-2.80-33	1.88-32	4.90-32	8.82-32	1.37-31	1.99-31	2.74-31	3.66-31	4.81-31	6.26-31	8.09-31	1.04-30	1.35-30	1.74-30
40	-1.05-32	2.32-32	7.27-32	1.40-31	2.27-31	3.42-31	4.89-31	6.81-31	9.34-31	1.27-30	1.73-30	2.37-30	3.26-30	4.59-30
35	-3.58-32	2.09-32	7.11-31	2.02-31	4.26-31	6.89-31	1.05-30	1.58-30	2.34-30	3.50-30	5.30-30	8.23-30	1.33-29	2.25-29
30	-1.40-31	-3.91-32	1.50-31	4.69-31	9.87-31	1.85-30	3.29-30	5.85-30	1.07-29	2.07-29	4.43-29	1.13-28	3.98-28	3.11-27
29	-1.90-31	-7.83-32	1.45-31	5.40-31	1.21-30	2.40-30	4.50-30	8.54-30	1.70-29	3.71-29	9.59-29	3.42-28	2.70 -7	
28	-2.62-31	-1.41-31	1.23-31	6.18-31	1.52-30	3.21-30	6.47-30	1.34-29	3.01-29	7.95-29	2.88-28	2.29-27		
27	-3.70-31	-2.48-31	6.65-32	6.98-31	1.94-30	4.48-30	9.95-30	2.34-29	6.37-29	2.36-28	1.92-27			
26	-5.34-31	-4.17-31	-5.98-32	7.94-31	2.53-30	6.63-30	1.69-29	4.84-29	1.86-28	1.54-27				
25	-7.94-31	-7.18-31	-3.33-31	7.17-31	3.37-30	1.06-29	3.36-29	1.37-28	1.19-27					
24	-1.22-30	-1.27-30	-9.38-31	3.62-31	4.53-30	1.95-29	9.00-29	8.41-28						
23	-1.97-30	-2.34-30	-2.36-30	-1.07-30	5.68-30	4.52-29	5.04-28							
22	-3.37-30	-4.64-30	-6.09-30	-6.84-30	2.12-30	1.91-28								
21	-6.24-30	-1.02-29	-1.79-29	-3.71-29	-1.05-28									
20	-1.29-29	-2.65-29	-7.01-29	-3.74-28										
19	-3.17-29	-9.52-29	-5.98-28											
18	-1.08-28	-7.47-28												
17	-7.94-28													

H TE = 1.00+03 NE = 1.00+09 CASE B NC = 20

TOTAL RC = 4.110-12 4-2 RC = 5.446-13 4-2 EM = 2.226-24 2S RC = 1.163-12 2P RC = 2.947-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.88-03	5.77-04	2.48-04	1.28-04	7.49-05	4.75-05	3.19-05	2.25-05	1.65-05	1.24-05	9.56-06	7.53-06	6.04-06	4.92-06
45	2.62-03	8.03-04	3.45-04	1.79-04	1.04-04	6.61-05	4.44-05	3.13-05	2.29-05	1.72-05	1.33-05	1.05-05	8.40-06	6.83-06
40	3.80-03	1.17-03	5.02-04	2.60-04	1.52-04	9.60-05	6.46-05	4.55-05	3.32-05	2.50-05	1.93-05	1.52-05	1.22-05	9.92-06
35	5.85-03	1.79-03	7.71-04	3.99-04	2.33-04	1.47-04	9.92-05	6.99-05	5.11-05	3.84-05	2.96-05	2.33-05	1.87-05	1.52-05
30	9.72-03	2.98-03	1.28-03	6.63-04	3.86-04	2.45-04	1.65-04	1.16-04	8.46-05	6.37-05	4.91-05	3.86-05	3.09-05	2.51-05
29	1.09-02	3.34-03	1.43-03	7.42-04	4.33-04	2.74-04	1.84-04	1.30-04	9.48-05	7.13-05	5.49-05	4.32-05	3.46-05	2.81-05
28	1.23-02	3.76-03	1.61-03	8.35-04	4.87-04	3.08-04	2.07-04	1.46-04	1.07-04	8.02-05	6.18-05	4.86-05	3.89-05	3.16-05
27	1.39-02	4.25-03	1.83-03	9.45-04	5.51-04	3.49-04	2.34-04	1.65-04	1.20-04	9.06-05	6.98-05	5.49-05	4.40-05	3.57-05
26	1.58-02	4.83-03	2.08-03	1.07-03	6.26-04	3.96-04	2.66-04	1.88-04	1.37-04	1.03-04	7.93-05	6.24-05	4.99-05	4.05-05
25	1.80-02	5.53-03	2.38-03	1.23-03	7.17-04	4.54-04	3.05-04	2.15-04	1.57-04	1.18-04	9.07-05	7.13-05	5.70-05	4.63-05
24	2.08-02	6.38-03	2.74-03	1.42-03	8.26-04	5.22-04	3.51-04	2.47-04	1.80-04	1.36-04	1.04-04	8.20-05	6.55-05	5.32-05
23	2.41-02	7.40-03	3.18-03	1.64-03	9.58-04	6.06-04	4.07-04	2.86-04	2.09-04	1.57-04	1.21-04	9.49-05	7.58-05	6.15-05
22	2.82-02	8.66-03	3.72-03	1.92-03	1.12-03	7.08-04	4.76-04	3.35-04	2.44-04	1.83-04	1.41-04	1.11-04	8.84-05	7.16-05
21	3.33-02	1.02-02	4.38-03	2.27-03	1.32-03	8.35-04	5.61-04	3.94-04	2.88-04	2.16-04	1.66-04	1.30-04	1.04-04	8.39-05
20	3.97-02	1.22-02	5.22-03	2.70-03	1.57-03	9.93-04	6.67-04	4.69-04	3.42-04	2.56-04	1.97-04	1.54-04	1.23-04	9.91-05
19	4.77-02	1.46-02	6.27-03	3.24-03	1.89-03	1.19-03	8.00-04	5.62-04	4.10-04	3.07-04	2.36-04	1.84-04	1.46-04	1.18-04
18	5.79-02	1.77-02	7.61-03	3.93-03	2.29-03	1.45-03	9.70-04	6.81-04	4.96-04	3.71-04	2.84-04	2.22-04	1.76-04	1.40-04
17	7.08-02	2.17-02	9.31-03	4.81-03	2.80-03	1.77-03	1.18-03	8.31-04	6.04-04	4.52-04	3.45-04	2.68-04	2.11-04	1.65-04
16	8.73-02	2.67-02	1.15-02	5.92-03	3.44-03	2.17-03	1.46-03	1.02-03	7.41-04	5.52-04	4.21-04	3.25-04	2.50-04	1.85-04
15	1.08-01	3.30-02	1.41-02	7.30-03	4.24-03	2.67-03	1.79-03	1.25-03	9.07-04	6.74-04	5.09-04	3.86-04	2.80-04	
14	1.32-01	4.03-02	1.73-02	8.91-03	5.18-03	3.26-03	2.18-03	1.52-03	1.10-03	8.09-04	6.01-04	4.29-04		
13	1.57-01	4.80-02	2.06-02	1.06-02	6.15-03	3.87-03	2.58-03	1.79-03	1.28-03	9.31-04	6.51-04			
12	1.78-01	5.44-02	2.33-02	1.20-02	6.95-03	4.36-03	2.90-03	2.00-03	1.41-03	9.61-04				
11	1.90-01	5.79-02	2.48-02	1.27-02	7.37-03	4.61-03	3.04-03	2.06-03	1.37-03					
10	1.94-01	5.91-02	2.53-02	1.30-02	7.47-03	4.64-03	3.01-03	1.92-03						
9	2.02-01	6.15-02	2.62-02	1.34-02	7.69-03	4.70-03	2.87-03							
8	2.25-01	6.86-02	2.92-02	1.49-02	8.40-03	4.84-03								
7	2.74-01	8.36-02	3.55-02	1.79-02	9.55-03									
6	3.66-01	1.12-01	4.74-02	2.27-02										
5	5.49-01	1.68-01	6.90-02											
4	1.00+00	2.96-01												
3	2.56+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.05-06	3.38-06	2.85-06	2.42-06	2.08-06	1.80-06	1.56-06	1.37-06	1.20-06	1.06-06	9.47-07	8.45-07	7.57-07	6.81-07
45	5.64-06	4.70-06	3.96-06	3.37-06	2.89-06	2.50-06	2.17-06	1.90-06	1.67-06	1.48-06	1.31-06	1.17-06	1.05-06	9.44-07
40	8.17-06	6.82-06	5.74-06	4.88-06	4.19-06	3.61-06	3.14-06	2.75-06	2.42-06	2.14-06	1.90-06	1.69-06	1.51-06	1.36-06
35	1.25-05	1.04-05	8.80-06	7.48-06	6.40-06	5.53-06	4.80-06	4.19-06	3.68-06	3.25-06	2.88-06	2.56-06	2.28-06	2.04-06
30	2.07-05	1.72-05	1.45-05	1.23-05	1.05-05	9.07-06	7.86-06	6.84-06	5.98-06	5.25-06	4.60-06	4.03-06	3.48-06	2.83-06
29	2.32-05	1.93-05	1.62-05	1.38-05	1.18-05	1.01-05	8.76-06	7.61-06	6.64-06	5.80-06	5.05-06	4.34-06	3.53-06	
28	2.60-05	2.17-05	1.82-05	1.54-05	1.32-05	1.13-05	9.79-06	8.49-06	7.38-06	6.39-06	5.47-06	4.43-06		
27	2.94-05	2.44-05	2.05-05	1.74-05	1.48-05	1.27-05	1.10-05	9.48-06	8.18-06	6.97-06	5.61-06			
26	3.33-05	2.77-05	2.33-05	1.97-05	1.68-05	1.44-05	1.23-05	1.06-05	8.96-06	7.18-06				
25	3.80-05	3.16-05	2.65-05	2.24-05	1.90-05	1.62-05	1.38-05	1.17-05	9.29-06					
24	4.37-05	3.62-05	3.03-05	2.56-05	2.16-05	1.83-05	1.53-05	1.22-05						
23	5.04-05	4.18-05	3.49-05	2.93-05	2.46-05	2.05-05	1.61-05							
22	5.86-05	4.85-05	4.03-05	3.36-05	2.77-05	2.17-05								
21	6.86-05	5.64-05	4.66-05	3.82-05	2.96-05									
20	8.06-05	6.59-05	5.35-05	4.12-05										
19	9.50-05	7.63-05	5.83-05											
18	1.11-04	8.40-05												
17	1.23-04													

H TE = 1.00+03 NE = 1.00+09 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.40-29	-7.99-36	-4.88-35	-1.52-34	-3.65-34	-7.36-34	-1.26-33	-1.71-33	-1.35-33	1.18-33	7.11-33	1.65-32	2.87-32	4.33-32
45	1.02-28	-1.13-35	-6.88-35	-2.15-34	-5.19-34	-1.05-33	-1.82-33	-2.51-33	-2.11-33	1.40-33	9.85-33	2.35-32	4.15-32	6.34-32
40	1.45-28	-1.69-35	-1.02-34	-3.19-34	-7.78-34	-1.60-33	-2.79-33	-3.95-33	-3.54-33	1.50-33	1.42-32	3.51-32	6.36-32	9.91-32
35	2.17-28	-2.69-35	-1.60-34	-5.06-34	-1.25-33	-2.60-33	-4.64-33	-6.78-33	-6.62-33	9.12-34	2.12-32	5.64-32	1.06-31	1.70-31
30	3.46-28	-4.70-35	-2.76-34	-8.83-34	-2.21-33	-4.71-33	-8.66-33	-1.33-32	-1.45-32	-2.88-33	3.30-32	9.95-32	2.00-31	3.39-31
29	3.84-28	-5.34-35	-3.13-34	-1.00-33	-2.52-33	-5.40-33	-1.00-32	-1.55-32	-1.74-32	-4.75-33	3.60-32	1.13-31	2.32-31	4.00-31
28	4.27-28	-6.09-35	-3.56-34	-1.14-33	-2.89-33	-6.23-33	-1.17-32	-1.83-32	-2.11-32	-7.38-33	3.92-32	1.29-31	2.71-31	4.77-31
27	4.77-28	-6.99-35	-4.07-34	-1.31-33	-3.34-33	-7.25-33	-1.37-32	-2.18-32	-2.59-32	-1.11-32	4.23-32	1.49-31	3.20-31	5.76-31
26	5.35-28	-8.09-35	-4.69-34	-1.52-33	-3.89-33	-8.51-33	-1.62-32	-2.63-32	-3.22-32	-1.65-32	4.52-32	1.73-31	3.83-31	7.07-31
25	6.03-28	-9.42-35	-5.44-34	-1.77-33	-4.56-33	-1.01-32	-1.95-32	-3.21-32	-4.07-32	-2.43-32	4.73-32	2.01-31	4.65-31	8.85-31
24	6.83-28	-1.11-34	-6.37-34	-2.08-33	-5.41-33	-1.21-32	-2.36-32	-3.98-32	-5.22-32	-3.59-32	4.76-32	2.36-31	5.72-31	1.13-30
23	7.77-28	-1.31-34	-7.52-34	-2.47-33	-6.49-33	-1.46-32	-2.91-32	-5.00-32	-6.82-32	-5.34-32	4.42-32	2.78-31	7.17-31	1.49-30
22	8.91-28	-1.57-34	-8.97-34	-2.97-33	-7.87-33	-1.80-32	-3.64-32	-6.41-32	-9.11-32	-8.05-32	3.32-32	3.29-31	9.19-31	2.03-30
21	1.03-27	-1.90-34	-1.08-33	-3.61-33	-9.67-33	-2.24-32	-4.63-32	-8.38-32	-1.25-31	1.24-31	7.05-33	3.87-31	1.21-30	2.89-30
20	1.19-27	-2.32-34	-1.32-33	-4.44-33	-1.21-32	-2.84-32	-6.00-32	-1.12-31	-1.75-31	-1.95-31	-4.96-32	4.46-31	1.64-30	4.40-30
19	1.40-27	-2.87-34	-1.63-33	-5.54-33	-1.53-32	-3.68-32	-7.97-32	-1.54-31	-2.55-31	-3.17-31	-1.73-31	4.79-31	2.30-30	7.29-30
18	1.65-27	-3.59-34	-2.04-33	-7.02-33	-1.97-32	-4.86-32	-1.09-31	-2.20-31	-3.87-31	-5.39-31	-4.48-31	3.92-31	3.38-30	1.39-29
17	1.97-27	-4.53-34	-2.58-33	-9.02-33	-2.59-32	-6.56-32	-1.52-31	-3.24-31	-6.14-31	-9.70-31	-1.10-30	-1.58-31	5.11-30	3.46-29
16	2.38-27	-5.75-34	-3.29-33	-1.18-32	-3.46-32	-9.07-32	-2.20-31	-4.98-31	-1.03-30	-1.88-30	-2.82-30	-2.71-30	6.80-30	1.65-28
15	2.92-27	-7.31-34	-4.23-33	-1.54-32	-4.69-32	-1.28-31	-3.29-31	-8.05-31	-1.87-30	-4.04-30	-8.27-30	-1.70-29	-2.77-29	
14	3.62-27	-9.48-34	-5.41-33	-2.03-32	-6.40-32	-1.85-31	-5.09-31	-1.38-30	-3.72-30	-1.02-29	-3.22-29	-1.82-28		
13	4.58-27	-1.30-33	-7.73-33	-2.69-32	-8.67-32	-2.68-31	-8.13-31	-2.53-30	-8.51-30	-3.44-29	-2.61-28			
12	5.92-27	-1.72-33	-1.09-32	-3.84-32	-1.24-31	-3.86-31	-1.34-30	-5.15-30	-2.51-29	-2.38-28				
11	7.85-27	-2.38-33	-1.66-32	-5.76-32	-1.94-31	-5.53-31	-2.35-30	-1.30-29	-1.46-28					
10	1.07-26	-3.59-33	-2.63-32	-9.18-32	-3.16-31	-9.35-31	-3.02-30	-1.63-29						
9	1.53-26	-5.87-33	-4.50-32	-1.63-31	-5.48-31	-1.60-30	-7.16-29							
8	2.29-26	-9.15-33	-7.58-32	-2.81-31	-9.51-31	-2.96-30								
7	3.70-26	-1.60-32	-1.34-31	-5.09-31	-1.71-30									
6	6.65-26	-3.01-32	-2.61-31	-9.96-31										
5	1.42-25	-6.32-32	-5.64-31											
4	3.26-25	-1.48-31												
3	8.09-25													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.02-32	7.97-32	1.02-31	1.29-31	1.61-31	1.98-31	2.43-31	2.96-31	3.61-31	4.39-31	5.34-31	6.51-31	7.94-31	9.72-31
45	8.93-32	1.20-31	1.56-31	2.00-31	2.53-31	3.17-31	3.96-31	4.94-31	6.16-31	7.70-31	9.64-31	1.21-30	1.53-30	1.95-30
40	1.42-31	1.95-31	2.60-31	3.40-31	4.41-31	5.69-31	7.34-31	9.47-31	1.23-30	1.60-30	2.11-30	2.80-30	3.78-30	5.19-30
35	2.52-31	3.57-31	4.92-31	6.70-31	9.07-31	1.23-30	1.68-30	2.31-30	3.22-30	4.59-30	6.70-30	1.01-29	1.59-29	2.65-29
30	5.31-31	7.97-31	1.17-30	1.72-30	2.55-30	3.83-30	5.92-30	9.49-30	1.61-29	2.94-29	6.03-29	1.48-28	5.09-28	3.88-27
29	6.36-31	9.71-31	1.46-30	2.20-30	3.34-30	5.21-30	8.42-30	1.43-29	2.63-29	5.42-29	1.34-28	4.60-28	3.52-27	
28	7.73-31	1.21-30	1.86-30	2.87-30	4.53-30	7.40-30	1.27-29	2.34-29	4.85-29	1.20-28	4.14-28	3.18-27		
27	9.55-31	1.53-30	2.42-30	3.89-30	6.42-30	1.11-29	2.07-29	4.30-29	1.07-28	3.71-28	2.85-27			
26	1.20-30	1.99-30	3.27-30	5.50-30	9.63-30	1.81-29	3.79-29	9.48-29	3.30-28	2.55-27				
25	1.56-30	2.67-30	4.60-30	8.21-30	1.56-29	3.30-29	8.33-29	2.91-28	2.26-27					
24	2.07-30	3.73-30	6.84-30	1.33-29	2.80-29	7.23-29	2.55-28	1.99-27						
23	2.87-30	5.50-30	1.10-29	2.40-29	6.18-29	2.20-28	1.73-27							
22	4.19-30	8.74-30	1.97-29	5.18-29	1.87-28	1.48-27								
21	6.55-30	1.55-29	4.20-29	1.55-28	1.25-27									
20	1.14-29	3.25-29	1.24-28	1.03-27										
19	2.32-29	9.39-29	8.05-28											
18	6.39-29	5.88-28												
17	3.74-28													

H TE = 1.00+03 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 7.821-12 4-2 RC = 1.080-12 4-2 EM = 4.415-24 2S RC = 1.842-12 2P RC = 5.979-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.48-04	2.91-04	1.25-04	6.48-05	3.78-05	2.39-05	1.61-05	1.14-05	8.30-06	6.25-06	4.82-06	3.80-06	3.04-06	2.48-06
45	1.32-03	4.05-04	1.74-04	9.02-05	5.26-05	3.33-05	2.24-05	1.58-05	1.15-05	8.69-06	6.71-06	5.28-06	4.23-06	3.45-06
40	1.92-03	5.89-04	2.53-04	1.31-04	7.64-05	4.84-05	3.26-05	2.29-05	1.68-05	1.26-05	9.74-06	7.67-06	6.15-06	5.00-06
35	2.95-03	9.05-04	3.89-04	2.01-04	1.17-04	7.44-05	5.00-05	3.52-05	2.58-05	1.94-05	1.50-05	1.18-05	9.43-06	7.67-06
30	4.91-03	1.50-03	6.46-04	3.35-04	1.95-04	1.24-04	8.31-05	5.85-05	4.27-05	3.22-05	2.48-05	1.95-05	1.56-05	1.27-05
29	5.50-03	1.69-03	7.24-04	3.75-04	2.19-04	1.38-04	9.31-05	6.55-05	4.79-05	3.60-05	2.78-05	2.18-05	1.75-05	1.42-05
28	6.19-03	1.90-03	8.16-04	4.22-04	2.46-04	1.56-04	1.05-04	7.38-05	5.39-05	4.05-05	3.12-05	2.46-05	1.97-05	1.60-05
27	7.01-03	2.15-03	9.23-04	4.78-04	2.79-04	1.76-04	1.19-04	8.35-05	6.09-05	4.58-05	3.53-05	2.78-05	2.22-05	1.81-05
26	7.98-03	2.45-03	1.05-03	5.44-04	3.17-04	2.01-04	1.35-04	9.50-05	6.93-05	5.21-05	4.02-05	3.16-05	2.53-05	2.05-05
25	9.15-03	2.80-03	1.20-03	6.23-04	3.63-04	2.30-04	1.55-04	1.09-04	7.94-05	5.97-05	4.60-05	3.61-05	2.89-05	2.35-05
24	1.06-02	3.24-03	1.39-03	7.19-04	4.19-04	2.65-04	1.78-04	1.25-04	9.15-05	6.88-05	5.30-05	4.16-05	3.33-05	2.70-05
23	1.23-02	3.77-03	1.62-03	8.37-04	4.87-04	3.08-04	2.07-04	1.46-04	1.06-04	7.99-05	6.15-05	4.83-05	3.86-05	3.13-05
22	1.44-02	4.42-03	1.90-03	9.81-04	5.72-04	3.62-04	2.43-04	1.71-04	1.25-04	9.36-05	7.20-05	5.65-05	4.51-05	3.65-05
21	1.71-02	5.24-03	2.25-03	1.16-03	6.77-04	4.28-04	2.88-04	2.02-04	1.47-04	1.11-04	8.51-05	6.68-05	5.32-05	4.30-05
20	2.05-02	6.27-03	2.69-03	1.39-03	8.11-04	5.13-04	3.44-04	2.42-04	1.76-04	1.32-04	1.02-04	7.96-05	6.34-05	5.11-05
19	2.48-02	7.61-03	3.27-03	1.69-03	9.83-04	6.21-04	4.17-04	2.93-04	2.13-04	1.60-04	1.23-04	9.61-05	7.63-05	6.13-05
18	3.06-02	9.37-03	4.02-03	2.08-03	1.21-03	7.64-04	5.13-04	3.60-04	2.62-04	1.96-04	1.50-04	1.17-04	9.28-05	7.40-05
17	3.83-02	1.17-02	5.03-03	2.60-03	1.51-03	9.55-04	6.40-04	4.49-04	3.26-04	2.44-04	1.87-04	1.45-04	1.14-04	8.92-05
16	4.88-02	1.49-02	6.40-03	3.31-03	1.92-03	1.21-03	8.13-04	5.70-04	4.14-04	3.09-04	2.35-04	1.81-04	1.40-04	1.03-04
15	6.34-02	1.94-02	8.32-03	4.30-03	2.50-03	1.57-03	1.05-03	7.37-04	5.34-04	3.97-04	3.00-04	2.27-04	1.65-04	
14	8.43-02	2.58-02	1.10-02	5.70-03	3.31-03	2.08-03	1.39-03	9.72-04	7.01-04	5.17-04	3.84-04	2.74-04		
13	1.14-01	3.49-02	1.50-02	7.71-03	4.47-03	2.81-03	1.87-03	1.30-03	9.33-04	6.76-04	4.72-04			
12	1.57-01	4.80-02	2.05-02	1.06-02	6.13-03	3.84-03	2.55-03	1.76-03	1.24-03	8.44-04				
11	2.16-01	6.58-02	2.81-02	1.45-02	8.35-03	5.22-03	3.44-03	2.33-03	1.54-03					
10	2.83-01	8.64-02	3.68-02	1.89-02	1.09-02	6.74-03	4.37-03	2.79-03						
9	3.35-01	1.02-01	4.34-02	2.22-02	1.27-02	7.73-03	4.71-03							
8	3.51-01	1.07-01	4.52-02	2.29-02	1.29-02	7.39-03								
7	3.62-01	1.10-01	4.61-02	2.30-02	1.22-02									
6	4.21-01	1.27-01	5.25-02	2.47-02										
5	5.82-01	1.73-01	6 79-02											
4	1.00+00	2.81-01												
3	2.45+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.04-06	1.71-06	1.44-06	1.22-06	1.05-06	9.06-07	7.88-07	6.90-07	6.07-07	5.37-07	4.77-07	4.26-07	3.82-07	3.43-07
45	2.84-06	2.37-06	2.00-06	1.70-06	1.46-06	1.26-06	1.09-06	9.58-07	8.42-07	7.45-07	6.62-07	5.91-07	5.29-07	4.76-07
40	4.12-06	3.44-06	2.90-06	2.46-06	2.11-06	1.82-06	1.58-06	1.39-06	1.22-06	1.08-06	9.56-07	8.52-07	7.63-07	6.85-07
35	6.32-06	5.27-06	4.44-06	3.77-06	3.23-06	2.79-06	2.42-06	2.12-06	1.86-06	1.64-06	1.45-06	1.29-06	1.15-06	1.03-06
30	1.05-05	8.71-06	7.33-06	6.22-06	5.32-06	4.58-06	3.97-06	3.46-06	3.02-06	2.65-06	2.32-06	2.03-06	1.76-06	1.43-06
29	1.17-05	9.74-06	8.19-06	6.95-06	5.94-06	5.11-06	4.42-06	3.85-06	3.35-06	2.93-06	2.55-06	2.19-06	1.78-06	
28	1.31-05	1.09-05	9.20-06	7.80-06	6.66-06	5.73-06	4.95-06	4.29-06	3.73-06	3.23-06	2.77-06	2.24-06		
27	1.49-05	1.24-05	1.04-05	8.79-06	7.50-06	6.44-06	5.55-06	4.80-06	4.14-06	3.52-06	2.84-06			
26	1.69-05	1.40-05	1.18-05	9.96-06	8.49-06	7.27-06	6.24-06	5.35-06	4.53-06	3.63-06				
25	1.93-05	1.60-05	1.34-05	1.13-05	9.64-06	8.22-06	7.01-06	5.90-06	4.71-06					
24	2.22-05	1.84-05	1.54-05	1.30-05	1.10-05	9.30-06	7.79-06	6.17-06						
23	2.57-05	2.13-05	1.78-05	1.49-05	1.25-05	1.04-05	8.21-06							
22	2.99-05	2.47-05	2.06-05	1.71-05	1.42-05	1.11-05								
21	3.52-05	2.89-05	2.39-05	1.96-05	1.52-05									
20	4.16-05	3.40-05	2.76-05	2.13-05										
19	4.95-05	3.98-05	3.04-05											
18	5.87-05	4.44-05												
17	6.66-05													

H TE = 1.00+03 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.41-28	-4.08-36	-2.96-35	-7.94-35	-1.19-34	8.82-35	1.37-33	5.12-33	1.17-32	1.99-32	2.90-32	3.91-32	5.05-32	6.36-32
45	1.93-28	-5.96-36	-4.23-35	-1.14-34	-1.77-34	9.70-35	1.87-33	7.14-33	1.64-32	2.83-32	4.16-32	5.66-32	7.38-32	9.40-32
40	2.76-28	-9.20-36	-6.37-35	-1.75-34	-2.81-34	8.72-35	2.64-33	1.04-32	2.43-32	4.24-32	6.32-32	8.71-32	1.15-31	1.49-31
35	4.13-28	-1.54-35	-1.03-34	-2.87-34	-4.87-34	8.83-36	3.88-33	1.61-32	3.85-32	6.83-32	1.04-31	1.46-31	1.97-31	2.61-31
30	6.59-28	-2.86-35	-1.84-34	-5.25-34	-9.54-34	-3.25-34	5.96-33	2.69-32	6.69-32	1.23-31	1.92-31	2.79-31	3.91-31	5.40-31
29	7.30-28	-3.29-35	-2.10-34	-6.03-34	-1.11-33	-4.70-34	6.52-33	3.01-32	7.59-32	1.40-31	2.22-31	3.25-31	4.60-31	6.43-31
28	8.12-28	-3.82-35	-2.41-34	-6.97-34	-1.31-33	-6.63-34	7.14-33	3.40-32	8.66-32	1.61-31	2.58-31	3.82-31	5.48-31	7.76-31
27	9.07-28	-4.46-35	-2.79-34	-8.12-34	-1.55-33	-9.23-34	7.81-33	3.85-32	9.95-32	1.88-31	3.03-31	4.55-31	6.62-31	9.52-31
26	1.02-27	-5.26-35	-3.25-34	-9.54-34	-1.86-33	-1.28-33	8.54-33	4.38-32	1.15-31	2.20-31	3.60-31	5.48-31	8.11-31	1.19-30
25	1.15-27	-6.24-35	-3.82-34	-1.13-33	-2.25-33	-1.76-33	9.30-33	5.03-32	1.35-31	2.61-31	4.34-31	6.71-31	1.01-30	1.52-30
24	1.30-27	-7.49-35	-4.54-34	-1.36-33	-2.76-33	-2.43-33	1.01-32	5.80-32	1.59-31	3.13-31	5.30-31	8.37-31	1.29-30	2.00-30
23	1.48-27	-9.09-35	-5.44-34	-1.64-33	-3.42-33	-3.37-33	1.08-32	6.73-32	1.89-31	3.81-31	6.59-31	1.07-30	1.69-30	2.71-30
22	1.70-27	-1.12-34	-6.61-34	-2.02-33	-4.31-33	-4.72-33	1.14-32	7.88-32	2.29-31	4.72-31	8.36-31	1.39-30	2.29-30	3.84-30
21	1.96-27	-1.39-34	-8.13-34	-2.51-33	-5.52-33	-6.67-33	1.16-32	9.29-32	2.80-31	5.96-31	1.09-30	1.88-30	3.24-30	5.77-30
20	2.27-27	-1.75-34	-1.02-33	-3.18-33	-7.19-33	-9.54-33	1.10-32	1.11-31	3.50-31	7.72-31	1.47-30	2.66-30	4.86-30	9.36-30
19	2.66-27	-2.24-34	-1.29-33	-4.11-33	-9.57-33	-1.39-32	8.92-33	1.32-31	4.45-31	1.03-30	2.05-30	3.95-30	7.85-30	1.70-29
18	3.14-27	-2.93-34	-1.67-33	-5.42-33	-1.31-32	-2.08-32	3.67-33	1.59-31	5.80-31	1.42-30	3.03-30	6.34-30	1.42-29	3.70-29
17	3.75-27	-3.91-34	-2.21-33	-7.33-33	-1.84-32	-3.20-32	-7.88-33	1.90-31	7.78-31	2.06-30	4.81-30	1.14-29	3.06-29	1.12-28
16	4.53-27	-5.33-34	-3.01-33	-1.02-32	-2.66-32	-5.08-32	-3.25-32	2.23-31	1.08-30	3.20-30	8.47-30	2.42-29	9.16-29	7.47-28
15	5.59-27	-7.45-34	-4.20-33	-1.46-32	-4.01-32	-8.38-32	-8.55-32	2.42-31	1.57-30	5.44-30	1.76-29	7.11-29	6.02-28	
14	6.89-27	-1.07-33	-6.04-33	-2.18-32	-6.30-32	-1.45-31	-2.05-31	1.96-31	2.38-30	1.07-29	4.99-29	4.54-28		
13	8.72-27	-1.57-33	-8.99-33	-3.37-32	-1.08-31	-2.68-31	-4.92-31	-1.22-31	3.79-30	2.79-29	2.99-28			
12	1.13-26	-2.33-33	-1.36-32	-5.40-32	-1.80-31	-5.29-31	-1.26-30	-1.65-30	5.59-30	1.36-28				
11	1.49-26	-3.45-33	-2.09-32	-8.86-32	-3.29-31	-1.14-30	-3.64-30	-1.02-29	-1.52-29					
10	2.04-26	-4.83-33	-3.10-32	-1.44-31	-6.17-31	-2.70-30	-1.33-29	-1.04-28						
9	2.91-26	-5.84-33	-4.17-32	-2.21-31	-1.17-30	-7.90-30	-8.98-29							
8	4.36-26	-5.62-33	-4.90-32	-3.18-31	-2.41-30	-3.61-29								
7	7.04-26	-4.24-33	-5.61-32	-5.20-31	-8.96-30									
6	1.27-25	-1.63-33	-7.87-32	-1.69-30										
5	2.71-25	6.88-33	-2.01-31											
4	8.10-25	7.98-32												
3	5.87-24													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.90-32	9.71-32	1.19-31	1.44-31	1.75-31	2.12-31	2.56-31	3.10-31	3.74-31	4.53-31	5.48-31	6.66-31	8.10-31	9.89-31
45	1.18-31	1.47-31	1.82-31	2.28-31	2.77-31	3.41-31	4.20-31	5.19-31	6.41-31	7.96-31	9.91-31	1.24-30	1.56-30	1.99-30
40	1.90-31	2.41-31	3.04-31	3.84-31	4.85-31	6.15-31	7.81-31	9.97-31	1.28-30	1.66-30	2.17-30	2.88-30	3.87-30	5.30-30
35	3.42-31	4.47-31	5.84-31	7.64-31	1.01-30	1.34-30	1.80-30	2.45-30	3.39-30	4.79-30	6.95-30	1.04-29	1.63-29	2.72-29
30	7.42-31	1.02-30	1.42-30	2.00-30	2.87-30	4.23-30	6.43-30	1.02-29	1.71-29	3.10-29	6.33-29	1.55-28	5.29-28	4.02-27
29	8.96-31	1.26-30	1.78-30	2.56-30	3.79-30	5.78-30	9.19-30	1.55-29	2.81-29	5.74-29	1.41-28	4.82-28	3.67-27	
28	1.10-30	1.57-30	2.28-30	3.38-30	5.17-30	8.25-30	1.39-29	2.54-29	5.20-29	1.28-28	4.38-28	3.34-27		
27	1.38-30	2.01-30	3.00-30	4.61-30	7.38-30	1.25-29	2.28-29	4.69-29	1.15-28	3.96-28	3.03-27			
26	1.76-30	2.64-30	4.09-30	6.57-30	1.12-29	2.05-29	4.21-29	1.04-28	3.58-28	2.74-27				
25	2.31-30	3.60-30	5.82-30	9.92-30	1.83-29	3.77-29	9.33-29	3.22-28	2.47-27					
24	3.14-30	5.12-30	8.78-30	1.62-29	3.36-29	8.34-29	2.89-28	2.22-27						
23	4.46-30	7.71-30	1.43-29	2.98-29	7.42-29	2.58-28	1.98-27							
22	6.71-30	1.26-29	2.63-29	6.58-29	2.29-28	1.77-27								
21	1.09-29	2.30-29	5.79-29	2.02-28	1.57-27									
20	2.00-29	5.06-29	1.78-28	1.38-27										
19	4.36-29	1.55-28	1.21-27											
18	1.33-28	1.05-27												
17	8.94-28													

H TE = 3.00+03 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 6.697-13 4-2 RC = 7.978-14 4-2 EP = 3.261-25 2S RC = 1.843-13 2P RC = 4.854-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.20-04	2.99-04	1.36-04	7.37-05	4.48-05	2.94-05	2.04-05	1.48-05	1.11-05	8.49-06	6.67-06	5.34-06	4.35-06	3.58-06
45	1.06-03	3.56-04	1.67-04	9.33-05	5.80-05	3.87-05	2.72-05	1.99-05	1.51-05	1.17-05	9.23-06	7.43-06	6.08-06	5.03-06
40	1.24-03	4.36-04	2.13-04	1.23-04	7.84-05	5.34-05	3.81-05	2.83-05	2.16-05	1.68-05	1.34-05	1.09-05	8.92-06	7.42-06
35	1.54-03	5.67-04	2.90-04	1.73-04	1.13-04	7.82-05	5.67-05	4.24-05	3.27-05	2.57-05	2.06-05	1.67-05	1.38-05	1.15-05
30	2.16-03	8.15-04	4.31-04	2.63-04	1.75-04	1.23-04	9.02-05	6.81-05	5.27-05	4.17-05	3.35-05	2.73-05	2.25-05	1.88-05
29	2.35-03	8.89-04	4.72-04	2.90-04	1.93-04	1.36-04	1.00-04	7.56-05	5.86-05	4.63-05	3.72-05	3.04-05	2.51-05	2.09-05
28	2.57-03	9.76-04	5.20-04	3.21-04	2.14-04	1.51-04	1.11-04	8.42-05	6.53-05	5.16-05	4.15-05	3.39-05	2.80-05	2.33-05
27	2.82-03	1.08-03	5.76-04	3.56-04	2.39-04	1.69-04	1.24-04	9.41-05	7.30-05	5.78-05	4.65-05	3.80-05	3.13-05	2.62-05
26	3.12-03	1.19-03	6.41-04	3.98-04	2.67-04	1.89-04	1.39-04	1.06-04	8.21-05	6.50-05	5.23-05	4.27-05	3.53-05	2.94-05
25	3.47-03	1.33-03	7.18-04	4.46-04	3.00-04	2.13-04	1.57-04	1.19-04	9.26-05	7.34-05	5.91-05	4.82-05	3.98-05	3.32-05
24	3.89-03	1.50-03	8.08-04	5.03-04	3.39-04	2.41-04	1.78-04	1.35-04	1.05-04	8.33-05	6.71-05	5.48-05	4.52-05	3.77-05
23	4.38-03	1.69-03	9.14-04	5.70-04	3.85-04	2.74-04	2.02-04	1.54-04	1.20-04	9.50-05	7.66-05	6.25-05	5.16-05	4.30-05
22	4.96-03	1.92-03	1.04-03	6.51-04	4.40-04	3.14-04	2.32-04	1.77-04	1.37-04	1.09-04	8.79-05	7.18-05	5.92-05	4.93-05
21	5.67-03	2.20-03	1.19-03	7.48-04	5.06-04	3.61-04	2.67-04	2.04-04	1.59-04	1.26-04	1.02-04	8.30-05	6.84-05	5.69-05
20	6.53-03	2.53-03	1.38-03	8.65-04	5.87-04	4.19-04	3.11-04	2.37-04	1.85-04	1.47-04	1.18-04	9.66-05	7.95-05	6.60-05
19	7.57-03	2.95-03	1.61-03	1.01-03	6.86-04	4.91-04	3.64-04	2.78-04	2.17-04	1.72-04	1.39-04	1.13-04	9.31-05	7.68-05
18	8.86-03	3.45-03	1.89-03	1.19-03	8.09-04	5.80-04	4.31-04	3.29-04	2.57-04	2.04-04	1.65-04	1.34-04	1.10-04	8.97-05
17	1.05-02	4.09-03	2.24-03	1.41-03	9.64-04	6.92-04	5.15-04	3.94-04	3.08-04	2.45-04	1.97-04	1.60-04	1.30-04	1.04-04
16	1.25-02	4.89-03	2.69-03	1.70-03	1.16-03	8.35-04	6.23-04	4.77-04	3.73-04	2.96-04	2.38-04	1.91-04	1.52-04	1.14-04
15	1.51-02	5.92-03	3.26-03	2.07-03	1.42-03	1.02-03	7.64-04	5.86-04	4.58-04	3.63-04	2.89-04	2.28-04	1.70-04	
14	1.85-02	7.27-03	4.02-03	2.56-03	1.76-03	1.27-03	9.52-04	7.31-04	5.71-04	4.50-04	3.52-04	2.60-04		
13	2.30-02	9.08-03	5.04-03	3.22-03	2.22-03	1.61-03	1.21-03	9.29-04	7.22-04	5.60-04	4.10-04			
12	2.92-02	1.15-02	6.45-03	4.14-03	2.87-03	2.09-03	1.57-03	1.20-03	9.22-04	6.70-04				
11	3.78-02	1.50-02	8.45-03	5.46-03	3.81-03	2.78-03	2.09-03	1.58-03	1.14-03					
10	5.02-02	2.01-02	1.14-02	7.43-03	5.22-03	3.83-03	2.86-03	2.04-03						
9	6.90-02	2.79-02	1.60-02	1.05-02	7.46-03	5.46-03	3.87-03							
8	9.88-02	4.04-02	2.35-02	1.57-02	1.12-02	7.87-03								
7	1.50-01	6.22-02	3.70-02	2.52-02	1.75-02									
6	2.45-01	1.04-01	6.42-02	4.36-02										
5	4.50-01	2.00-01	1.27-01											
4	1.00+00	4.75-01												
3	3.21+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.99-06	2.52-06	2.15-06	1.84-06	1.59-06	1.39-06	1.22-06	1.07-06	9.48-07	8.43-07	7.54-07	6.76-07	6.09-07	5.50-07
45	4.22-06	3.57-06	3.04-06	2.62-06	2.27-06	1.98-06	1.74-06	1.53-06	1.36-06	1.21-06	1.08-06	9.70-07	8.74-07	7.90-07
40	6.23-06	5.29-06	4.52-06	3.90-06	3.38-06	2.95-06	2.59-06	2.29-06	2.03-06	1.80-06	1.61-06	1.45-06	1.30-06	1.17-06
35	9.66-06	8.21-06	7.03-06	6.06-06	5.26-06	4.59-06	4.02-06	3.55-06	3.14-06	2.79-06	2.48-06	2.22-06	1.98-06	1.78-06
30	1.58-05	1.34-05	1.15-05	9.90-06	8.57-06	7.46-06	6.52-06	5.72-06	5.03-06	4.42-06	3.89-06	3.40-06	2.93-06	2.38-06
29	1.76-05	1.50-05	1.28-05	1.10-05	9.52-06	8.28-06	7.22-06	6.32-06	5.54-06	4.85-06	4.22-06	3.63-06	2.93-06	
28	1.97-05	1.67-05	1.43-05	1.23-05	1.06-05	9.20-06	8.01-06	6.99-06	6.09-06	5.29-06	4.52-06	3.63-06		
27	2.20-05	1.87-05	1.60-05	1.37-05	1.18-05	1.02-05	8.90-06	7.72-06	6.67-06	5.68-06	4.55-06			
26	2.48-05	2.10-05	1.79-05	1.54-05	1.32-05	1.14-05	9.87-06	8.49-06	7.19-06	5.74-06				
25	2.80-05	2.37-05	2.02-05	1.73-05	1.48-05	1.27-05	1.09-05	9.20-06	7.30-06					
24	3.17-05	2.68-05	2.28-05	1.95-05	1.66-05	1.42-05	1.19-05	9.39-06						
23	3.61-05	3.05-05	2.59-05	2.20-05	1.86-05	1.55-05	1.22-05							
22	4.13-05	3.48-05	2.94-05	2.47-05	2.05-05	1.60-05								
21	4.76-05	3.99-05	3.34-05	2.75-05	2.14-05									
20	5.49-05	4.56-05	3.74-05	2.89-05										
19	6.34-05	5.16-05	3.96-05											
18	7.26-05	5.52-05												
17	7.86-05													

H TE = 3.00+03 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	3.49-37	-2.77-37	-1.57-36	-3.77-36	-6.59-36	-8.93-36	-8.54-36	-1.49-36	1.83-35	5.98-35	1.36-34	2.63-34	4.67-34
45	0.00+00	6.25-37	2.03-37	-5.63-37	-1.71-36	-2.66-36	-1.85-36	3.69-36	1.89-35	5.13-35	1.12-34	2.17-34	3.89-34	6.58-34
40	0.00+00	1.08-36	1.06-36	1.31-36	2.11-36	4.42-36	1.03-35	2.33-35	4.93-35	9.70-35	1.79-34	3.15-34	5.30-34	8.63-34
35	0.00+00	1.79-36	2.40-36	4.33-36	8.32-36	1.59-35	2.97-35	5.38-35	9.46-35	1.61-34	2.68-34	4.35-34	6.91-34	1.08-33
30	0.00+00	2.97-36	4.55-36	9.22-36	1.86-35	3.54-35	6.33-35	1.08-34	1.75-34	2.77-34	4.26-34	6.43-34	9.58-34	1.41-33
29	0.00+00	3.30-36	5.14-36	1.06-35	2.15-35	4.11-35	7.34-35	1.24-34	2.01-34	3.14-34	4.78-34	7.13-34	1.05-33	1.52-33
28	0.00+00	3.68-36	5.81-36	1.21-35	2.49-35	4.77-35	8.51-35	1.44-34	2.31-34	3.59-34	5.42-34	8.01-34	1.16-33	1.66-33
27	0.00+00	4.11-36	6.58-36	1.39-35	2.88-35	5.54-35	9.92-35	1.67-34	2.69-34	4.15-34	6.23-34	9.12-34	1.31-33	1.84-33
26	0.00+00	4.62-36	7.48-36	1.60-35	3.34-35	6.47-35	1.16-34	1.96-34	3.15-34	4.86-34	7.26-34	1.06-33	1.49-33	2.06-33
25	0.00+00	5.22-36	8.53-36	1.85-35	3.89-35	7.58-35	1.37-34	2.32-34	3.73-34	5.77-34	8.60-34	1.24-33	1.74-33	2.36-33
24	0.00+00	5.92-36	9.78-36	2.14-35	4.56-35	8.94-35	1.62-34	2.77-34	4.48-34	6.94-34	1.04-33	1.49-33	2.07-33	2.73-33
23	0.00+00	6.76-36	1.13-35	2.50-35	5.37-35	1.06-34	1.95-34	3.34-34	5.45-34	8.50-34	1.27-33	1.84-33	2.52-33	3.19-33
22	0.00+00	7.77-36	1.31-35	2.93-35	6.38-35	1.28-34	2.36-34	4.10-34	6.74-34	1.06-33	1.60-33	2.31-33	3.13-33	3.73-33
21	0.00+00	8.99-36	1.53-35	3.47-35	7.64-35	1.55-34	2.90-34	5.09-34	8.49-34	1.35-33	2.06-33	2.98-33	3.95-33	4.18-33
20	0.00+00	1.05-35	1.81-35	4.15-35	9.26-35	1.90-34	3.61-34	6.45-34	1.09-33	1.77-33	2.74-33	3.96-33	5.02-33	3.84-33
19	0.00+00	1.24-35	2.15-35	5.02-35	1.14-34	2.37-34	4.59-34	8.35-34	1.44-33	2.39-33	3.75-33	5.41-33	6.17-33	-4.24-34
18	0.00+00	1.47-35	2.59-35	6.15-35	1.42-34	3.02-34	5.96-34	1.11-33	1.97-33	3.34-33	5.34-33	7.52-33	5.97-33	-2.51-32
17	0.00+00	1.77-35	3.17-35	7.65-35	1.80-34	3.92-34	7.95-34	1.52-33	2.79-33	4.89-33	7.94-33	1.02-32	-4.99-33	-1.96-31
16	0.00+00	2.15-35	3.92-35	9.69-35	2.34-34	5.23-34	1.10-33	2.18-33	4.16-33	7.57-33	1.23-32	9.45-33	-1.10-31	-2.82-30
15	0.00+00	2.66-35	4.95-35	1.25-34	3.12-34	7.22-34	1.57-33	3.29-33	6.62-33	1.26-32	1.84-32	-4.18-32	-2.00-30	
14	0.00+00	3.34-35	6.38-35	1.67-34	4.30-34	1.04-33	2.39-33	5.32-33	1.15-32	2.25-32	6.80-33	-1.29-30		
13	0.00+00	4.29-35	8.42-35	2.29-34	6.20-34	1.59-33	3.93-33	9.54-33	2.26-32	3.72-32	-7.12-31			
12	0.00+00	5.63-35	1.15-34	3.29-34	9.46-34	2.62-33	7.18-33	1.99-32	5.15-32	-2.69-31				
11	0.00+00	7.63-35	1.63-34	4.98-34	1.56-33	4.86-33	1.56-32	5.28-32	3.17-32					
10	0.00+00	1.07-34	2.44-34	8.17-34	2.90-33	1.08-32	4.52-32	1.97-31						
9	0.00+00	1.58-34	3.92-34	1.50-33	6.49-33	3.31-32	2.47-31							
8	0.00+00	2.50-34	7.04-34	3.34-33	2.05-32	2.16-31								
7	0.00+00	4.35-34	1.50-33	1.05-32	1.47-31									
6	0.00+00	8.85-34	4.46-33	7.63-32										
5	0.00+00	2.40-33	3.00-32											
4	0.00+00	1.31-32												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.77-34	1.24-33	1.90-33	2.85-33	4.17-33	5.99-33	8.48-33	1.19-32	1.64-32	2.26-32	3.08-32	4.19-32	5.66-32	7.64-32
45	1.07-33	1.67-33	2.55-33	3.80-33	5.57-33	8.06-33	1.15-32	1.63-32	2.30-32	3.22-32	4.49-32	6.26-32	8.73-32	1.22-31
40	1.37-33	2.11-33	3.21-33	4.80-33	7.09-33	1.04-32	1.51-32	2.19-32	3.16-32	4.57-32	6.63-32	9.67-32	1.42-31	2.12-31
35	1.66-33	2.53-33	3.82-33	5.73-33	8.58-33	1.28-32	1.92-32	2.89-32	4.39-32	6.74-32	1.06-31	1.70-31	2.82-31	4.93-31
30	2.07-33	3.03-33	4.44-33	6.54-33	9.70-33	1.46-32	2.22-32	3.48-32	5.62-32	9.55-32	1.76-31	3.73-31	1.08-30	8.02-30
29	2.20-33	3.17-33	4.56-33	6.58-33	9.55-33	1.40-32	2.07-32	3.10-32	4.70-32	7.21-32	1.09-31	1.48-31	4.28-31	
28	2.36-33	3.32-33	4.63-33	6.43-33	8.84-33	1.19-32	1.53-32	1.68-32	7.19-33	-5.76-32	-4.50-31	-4.51-30		
27	2.55-33	3.46-33	4.59-33	5.85-33	6.85-33	6.23-33	-5.73-34	-3.01-32	-1.54-31	-8.04-31	-7.55-30			
26	2.77-33	3.57-33	4.28-33	4.29-33	1.80-33	-8.92-33	-4.79-32	-2.00-31	-9.80-31	-9.21-30				
25	3.03-33	3.55-33	3.28-33	3.10-34	-1.14-32	-5.26-32	-2.13-31	-1.03-30	-9.89-30					
24	3.28-33	3.14-33	5.40-34	-1.02-32	-4.90-32	-2.03-31	-1.01-30	-9.89-30						
23	3.40-33	1.63-33	-7.05-33	-4.06-32	-1.79-31	-9.25-31	-9.45-30							
22	2.97-33	-3.17-33	-3.00-32	-1.47-31	-8.11-31	-8.71-30								
21	6.28-34	-1.90-32	-1.14-31	-6.82-31	-7.79-30									
20	-8.90-33	-8.06-32	-5.48-31	-6.78-30										
19	-5.06-32	-4.19-31	-5.73-30											
18	-3.00-31	-4.71-30												
17	-3.73-30													

H TE = 3.00+03 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 6.726-13 4-2 RC = 8.036-14 4-2 EM = 3.284-25 2S RC = 1.861-13 2P RC = 4.865-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.28-03	3.96-04	1.72-04	8.97-05	5.27-05	3.36-05	2.27-05	1.61-05	1.18-05	8.95-06	6.93-06	5.48-06	4.41-06	3.60-06
45	1.59-03	4.96-04	2.17-04	1.14-04	6.74-05	4.32-05	2.94-05	2.09-05	1.54-05	1.17-05	9.07-06	7.19-06	5.80-06	4.74-06
40	1.99-03	6.32-04	2.80-04	1.50-04	8.95-05	5.79-05	3.97-05	2.85-05	2.11-05	1.61-05	1.26-05	1.00-05	8.11-06	6.66-06
35	2.46-03	8.06-04	3.69-04	2.02-04	1.26-04	8.16-05	5.68-05	4.12-05	3.09-05	2.38-05	1.87-05	1.50-05	1.22-05	1.01-05
30	3.04-03	1.05-03	5.08-04	2.90-04	1.83-04	1.24-04	8.81-05	6.50-05	4.94-05	3.85-05	3.05-05	2.47-05	2.02-05	1.68-05
29	3.19-03	1.12-03	5.47-04	3.15-04	2.01-04	1.36-04	9.74-05	7.21-05	5.49-05	4.29-05	3.41-05	2.76-05	2.26-05	1.88-05
28	3.37-03	1.20-03	5.91-04	3.44-04	2.21-04	1.51-04	1.06-04	8.03-05	6.14-05	4.80-05	3.82-05	3.09-05	2.54-05	2.11-05
27	3.57-03	1.28-03	6.43-04	3.78-04	2.44-04	1.68-04	1.21-04	8.99-05	6.88-05	5.39-05	4.30-05	3.48-05	2.86-05	2.38-05
26	3.82-03	1.39-03	7.04-04	4.17-04	2.71-04	1.87-04	1.35-04	1.01-04	7.76-05	6.09-05	4.86-05	3.94-05	3.24-05	2.69-05
25	4.11-03	1.51-03	7.75-04	4.63-04	3.03-04	2.10-04	1.53-04	1.14-04	8.79-05	6.90-05	5.52-05	4.48-05	3.68-05	3.06-05
24	4.47-03	1.66-03	8.60-04	5.18-04	3.41-04	2.38-04	1.73-04	1.30-04	1.00-04	7.87-05	6.29-05	5.11-05	4.20-05	3.49-05
23	4.90-03	1.84-03	9.61-04	5.83-04	3.86-04	2.70-04	1.97-04	1.48-04	1.14-04	9.01-05	7.21-05	5.86-05	4.81-05	3.99-05
22	5.43-03	2.05-03	1.08-03	6.62-04	4.40-04	3.09-04	2.26-04	1.70-04	1.32-04	1.04-04	8.31-05	6.75-05	5.54-05	4.59-05
21	6.09-03	2.31-03	1.23-03	7.56-04	5.05-04	3.56-04	2.61-04	1.97-04	1.52-04	1.20-04	9.63-05	7.82-05	6.42-05	5.31-05
20	6.89-03	2.63-03	1.41-03	8.72-04	5.84-04	4.13-04	3.04-04	2.30-04	1.78-04	1.40-04	1.12-04	9.11-05	7.47-05	6.17-05
19	7.89-03	3.03-03	1.63-03	1.01-03	6.82-04	4.83-04	3.56-04	2.70-04	2.09-04	1.65-04	1.32-04	1.07-04	8.74-05	7.19-05
18	9.13-03	3.52-03	1.91-03	1.19-03	8.03-04	5.71-04	4.21-04	3.19-04	2.48-04	1.95-04	1.56-04	1.26-04	1.03-04	8.38-05
17	1.07-02	4.15-03	2.25-03	1.41-03	9.56-04	6.81-04	5.03-04	3.82-04	2.96-04	2.34-04	1.87-04	1.50-04	1.21-04	9.70-05
16	1.27-02	4.94-03	2.70-03	1.70-03	1.15-03	8.22-04	6.08-04	4.62-04	3.59-04	2.83-04	2.25-04	1.80-04	1.42-04	1.07-04
15	1.53-02	5.96-03	3.27-03	2.06-03	1.40-03	1.01-03	7.45-04	5.67-04	4.40-04	3.45-04	2.73-04	2.14-04	1.59-04	
14	1.87-02	7.31-03	4.03-03	2.55-03	1.74-03	1.25-03	9.28-04	7.06-04	5.46-04	4.26-04	3.31-04	2.43-04		
13	2.32-02	9.11-03	5.04-03	3.20-03	2.20-03	1.58-03	1.18-03	8.94-04	6.88-04	5.28-04	3.84-04			
12	2.93-02	1.16-02	6.44-03	4.11-03	2.83-03	2.05-03	1.52-03	1.15-03	8.73-04	6.28-04				
11	3.79-02	1.51-02	8.43-03	5.42-03	3.75-03	2.71-03	2.02-03	1.51-03	1.07-03					
10	5.04-02	2.01-02	1.14-02	7.36-03	5.13-03	3.72-03	2.73-03	1.92-03						
9	6.92-02	2.79-02	1.59-02	1.04-02	7.29-03	5.26-03	3.66-03							
8	9.91-02	4.04-02	2.34-02	1.55-02	1.09-02	7.49-03								
7	1.50-01	6.21-02	3.67-02	2.46-02	1.67-02									
6	2.46-01	1.04-01	6.33-02	4.20-02										
5	4.51-01	1.99-01	1.23-01											
4	1.00+00	4.66-01												
3	3.18+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.98-06	2.49-06	2.10-06	1.79-06	1.54-06	1.33-06	1.16-06	1.02-06	8.99-07	7.97-07	7.09-07	6.34-07	5.69-07	5.13-07
45	3.93-06	3.29-06	2.79-06	2.38-06	2.05-06	1.77-06	1.55-06	1.36-06	1.20-06	1.06-06	9.47-07	8.47-07	7.60-07	6.85-07
40	5.54-06	4.65-06	3.95-06	3.38-06	2.91-06	2.53-06	2.21-06	1.94-06	1.72-06	1.52-06	1.36-06	1.22-06	1.09-06	9.84-07
35	8.43-06	7.11-06	6.05-06	5.20-06	4.49-06	3.91-06	3.42-06	3.01-06	2.66-06	2.36-06	2.11-06	1.88-06	1.69-06	1.52-06
30	1.40-05	1.19-05	1.01-05	8.71-06	7.54-06	6.56-06	5.73-06	5.03-06	4.43-06	3.91-06	3.45-06	3.03-06	2.63-06	2.15-06
29	1.57-05	1.33-05	1.14-05	9.76-06	8.44-06	7.34-06	6.41-06	5.61-06	4.93-06	4.33-06	3.79-06	3.27-06	2.66-06	
28	1.77-05	1.50-05	1.28-05	1.10-05	9.47-06	8.22-06	7.17-06	6.26-06	5.47-06	4.77-06	4.10-06	3.32-06		
27	1.99-05	1.69-05	1.44-05	1.23-05	1.07-05	9.23-06	8.02-06	6.98-06	6.05-06	5.17-06	4.17-06			
26	2.26-05	1.91-05	1.63-05	1.39-05	1.20-05	1.04-05	8.97-06	7.73-06	6.58-06	5.28-06				
25	2.56-05	2.17-05	1.84-05	1.58-05	1.35-05	1.16-05	9.98-06	8.45-06	6.74-06					
24	2.92-05	2.47-05	2.09-05	1.79-05	1.53-05	1.30-05	1.09-05	8.69-06						
23	3.34-05	2.82-05	2.38-05	2.02-05	1.71-05	1.43-05	1.13-05							
22	3.84-05	3.23-05	2.72-05	2.29-05	1.90-05	1.49-05								
21	4.42-05	3.70-05	3.09-05	2.55-05	1.99-05									
20	5.11-05	4.24-05	3.47-05	2.69-05										
19	5.91-05	4.80-05	3.69-05											
18	6.76-05	5.15-05												
17	7.33-05													

H TE = 3.00+03 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	8.09-38	-1.38-36	-4.73-36	-1.10-35	-2.10-35	-3.49-35	-5.17-35	-6.93-35	-8.35-35	-8.77-35	-7.20-35	-2.25-35	7.98-35
45	0.00+00	2.35-37	-1.39-36	-5.02-36	-1.16-35	-2.16-35	-3.42-35	-4.68-35	-5.46-35	-4.92-35	-1.74-35	6.01-35	2.11-34	4.73-34
40	0.00+00	5.41-37	-1.16-36	-4.84-36	-1.13-35	-2.03-35	-2.99-35	-3.52-35	-2.73-35	8.38-36	9.48-35	2.66-34	5.73-34	1.09-33
35	0.00+00	1.20-36	-2.02-37	-2.99-36	-7.51-36	-1.25-35	-1.39-35	-3.52-36	3.32-35	1.20-34	2.96-34	6.20-34	1.18-33	2.11-33
30	0.00+00	2.54-36	2.25-36	2.34-36	3.51-36	8.77-36	2.48-35	6.41-35	1.49-34	3.16-34	6.25-34	1.17-33	2.12-33	3.71-33
29	0.00+00	2.93-36	2.99-36	4.01-36	6.98-36	1.53-35	3.64-35	8.36-35	1.81-34	3.67-34	7.09-34	1.31-33	2.35-33	4.12-33
28	0.00+00	3.38-36	3.85-36	5.93-36	1.10-35	2.29-35	4.97-35	1.06-34	2.16-34	4.24-34	8.00-34	1.46-33	2.60-33	4.56-33
27	0.00+00	3.89-36	4.82-36	8.13-36	1.56-35	3.16-35	6.50-35	1.31-34	2.57-34	4.88-34	9.01-34	1.63-33	2.88-33	5.01-33
26	0.00+00	4.47-36	5.93-36	1.07-35	2.09-35	4.18-35	8.28-35	1.61-34	3.04-34	5.61-34	1.02-33	1.81-33	3.19-33	5.58-33
25	0.00+00	5.14-36	7.18-36	1.35-35	2.71-35	5.36-35	1.04-34	1.95-34	3.59-34	6.48-34	1.15-33	2.02-33	3.54-33	6.21-33
24	0.00+00	5.90-36	8.63-36	1.69-35	3.43-35	6.77-35	1.29-34	2.37-34	4.26-34	7.52-34	1.31-33	2.28-33	3.96-33	6.94-33
23	0.00+00	6.79-36	1.03-35	2.08-35	4.28-35	8.45-35	1.59-34	2.89-34	5.16-34	8.83-34	1.52-33	2.60-33	4.47-33	7.81-33
22	0.00+00	7.85-36	1.23-35	2.54-35	5.31-35	1.05-34	1.97-34	3.54-34	6.16-34	1.05-33	1.78-33	3.00-33	5.11-33	8.85-33
21	0.00+00	9.10-36	1.46-35	3.10-35	6.56-35	1.31-34	2.45-34	4.38-34	7.57-34	1.28-33	2.13-33	3.54-33	5.92-33	1.00-32
20	0.00+00	1.06-35	1.74-35	3.79-35	8.13-35	1.63-34	3.08-34	5.51-34	9.50-34	1.59-33	2.63-33	4.28-33	6.93-33	1.10-32
19	0.00+00	1.25-35	2.09-35	4.64-35	1.01-34	2.06-34	3.93-34	7.08-34	1.22-33	2.05-33	3.35-33	5.32-33	8.01-33	1.02-32
18	0.00+00	1.48-35	2.53-35	5.74-35	1.28-34	2.64-34	5.11-34	9.32-34	1.63-33	2.74-33	4.44-33	6.71-33	8.12-33	-2.23-33
17	0.00+00	1.78-35	3.10-35	7.19-35	1.64-34	3.45-34	6.80-34	1.27-33	2.26-33	3.85-33	6.14-33	8.15-33	7.61-34	-9.89-32
16	0.00+00	2.17-35	3.84-35	9.14-35	2.13-34	4.62-34	9.36-34	1.80-33	3.29-33	5.70-33	8.72-33	6.16-33	-6.79-32	-1.54-30
15	0.00+00	2.67-35	4.85-35	1.19-34	2.85-34	6.39-34	1.34-33	2.68-33	5.11-33	9.00-33	1.14-32	-3.41-32	-1.20-30	
14	0.00+00	3.36-35	6.24-35	1.58-34	3.94-34	9.23-34	2.03-33	4.28-33	8.61-33	1.49-32	-3.75-33	-8.53-31		
13	0.00+00	4.39-35	8.25-35	2.17-34	5.68-34	1.40-33	3.30-33	7.53-33	1.61-32	1.92-32	-5.27-31			
12	0.00+00	5.65-35	1.12-34	3.11-34	8.65-34	2.30-33	5.97-33	1.52-32	3.32-32	-2.46-31				
11	0.00+00	7.65-35	1.59-34	4.72-34	1.43-33	4.23-33	1.27-32	3.81-32	-2.95-32					
10	0.00+00	1.08-34	2.38-34	7.72-34	2.63-33	9.24-33	3.54-32	1.11-31						
9	0.00+00	1.59-34	3.83-34	1.42-33	5.84-33	2.76-32	1.74-31							
8	0.00+00	2.51-34	6.86-34	3.12-33	1.81-32	1.70-31								
7	0.00+00	4.36-34	1.46-33	9.69-33	1.25-31									
6	0.00+00	8.86-34	4.31-33	6.91-32										
5	0.00+00	2.40-33	2.86-32											
4	0.00+00	1.30-32												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.60-34	5.52-34	9.96-34	1.65-33	2.57-33	3.85-33	5.58-33	7.88-33	1.09-32	1.47-32	1.96-32	2.57-32	3.33-32	4.24-32
45	8.99-34	1.56-33	2.55-33	4.00-33	6.08-33	9.01-33	1.31-32	1.87-32	2.63-32	3.66-32	5.05-32	6.91-32	9.41-32	1.28-31
40	1.91-33	3.19-33	5.13-33	8.02-33	1.23-32	1.84-32	2.74-32	4.03-32	5.89-32	8.56-32	1.24-31	1.81-31	2.65-31	3.91-31
35	3.62-33	6.00-33	9.72-33	1.55-32	2.43-32	3.80-32	5.91-32	9.20-32	1.44-31	2.28-31	3.66-31	6.04-31	1.03-30	1.84-30
30	6.37-33	1.08-32	1.80-32	3.02-32	5.06-32	8.58-32	1.48-31	2.64-31	4.91-31	9.77-31	2.15-30	5.62-30	2.02-29	1.57-28
29	7.09-33	1.21-32	2.05-32	3.48-32	5.96-32	1.04-31	1.87-31	3.50-31	6.99-31	1.55-30	4.05-30	1.45-29	1.13-28	
28	7.88-33	1.35-32	2.33-32	4.04-32	7.11-32	1.29-31	2.42-31	4.87-31	1.08-30	2.82-30	1.01-29	7.82-29		
27	8.76-33	1.52-32	2.67-32	4.73-32	8.62-32	1.63-31	3.29-31	7.30-31	1.91-30	6.79-30	5.22-29			
26	9.77-33	1.72-32	3.07-32	5.63-32	1.07-31	2.16-31	4.79-31	1.24-30	4.39-30	3.33-29				
25	1.09-32	1.96-32	3.59-32	6.81-32	1.37-31	3.03-31	7.79-31	2.71-30	2.02-29					
24	1.23-32	2.24-32	4.23-32	8.43-32	1.84-31	4.64-31	1.57-30	1.13-29						
23	1.40-32	2.58-32	5.03-32	1.06-31	2.59-31	8.29-31	5.54-30							
22	1.58-32	2.94-32	5.87-32	1.31-31	3.65-31	1.92-30								
21	1.74-32	3.11-32	5.69-32	9.46-32	-2.08-31									
20	1.66-32	1.81-32	-4.71-32	-1.35-30										
19	1.48-33	-1.07-31	-1.85-30											
18	-1.17-31	-1.95-30												
17	-1.81-30													

H TE = 3.00+03 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 6.784-13 4-2 RC = 8.136-14 4-2 EM = 3.325-25 2S RC = 1.894-13 2P RC = 4.890-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.75-03	5.37-04	2.31-04	1.20-04	6.99-05	4.43-05	2.99-05	2.11-05	1.54-05	1.16-05	8.97-06	7.07-06	5.67-06	4.62-06
45	2.13-03	6.54-04	2.82-04	1.46-04	8.54-05	5.42-05	3.65-05	2.58-05	1.89-05	1.42-05	1.10-05	8.67-06	6.96-06	5.67-06
40	2.64-03	8.13-04	3.51-04	1.83-04	1.07-04	6.80-05	4.59-05	3.24-05	2.38-05	1.79-05	1.39-05	1.09-05	8.79-06	7.16-06
35	3.44-03	1.07-03	4.63-04	2.42-04	1.43-04	9.10-05	6.16-05	4.37-05	3.21-05	2.43-05	1.88-05	1.49-05	1.20-05	9.78-06
30	4.67-03	1.47-03	6.50-04	3.45-04	2.05-04	1.32-04	9.04-05	6.46-05	4.78-05	3.64-05	2.83-05	2.25-05	1.82-05	1.49-05
29	4.97-03	1.57-03	6.99-04	3.72-04	2.23-04	1.44-04	9.87-05	7.07-05	5.24-05	4.00-05	3.12-05	2.48-05	2.01-05	1.65-05
28	5.28-03	1.69-03	7.53-04	4.04-04	2.42-04	1.57-04	1.08-04	7.78-05	5.78-05	4.42-05	3.45-05	2.75-05	2.23-05	1.83-05
27	5.61-03	1.81-03	8.13-04	4.39-04	2.65-04	1.73-04	1.19-04	8.60-05	6.41-05	4.91-05	3.85-05	3.07-05	2.49-05	2.05-05
26	5.95-03	1.93-03	8.79-04	4.78-04	2.91-04	1.91-04	1.32-04	9.57-05	7.16-05	5.49-05	4.31-05	3.45-05	2.80-05	2.30-05
25	6.32-03	2.08-03	9.55-04	5.24-04	3.21-04	2.12-04	1.48-04	1.07-04	8.04-05	6.19-05	4.87-05	3.90-0'	3.17-05	2.61-05
24	6.70-03	2.23-03	1.04-03	5.77-04	3.56-04	2.37-04	1.66-04	1.21-04	9.10-05	7.03-05	5.54-05	4.44-05	3.62-05	2.98-05
23	7.13-03	2.41-03	1.14-03	6.39-04	3.93-04	2.66-04	1.88-04	1.37-04	1.04-04	8.04-05	6.35-05	5.10-05	4.16-05	3.43-05
22	7.61-03	2.62-03	1.25-03	7.13-04	4.48-04	3.02-04	2.14-04	1.58-04	1.19-04	9.27-05	7.34-05	5.91-05	4.82-05	3.98-05
21	8.17-03	2.86-03	1.39-03	8.02-04	5.10-04	3.46-04	2.47-04	1.82-04	1.39-04	1.08-04	8.55-05	6.88-05	5.62-05	4.63-05
20	8.85-03	3.15-03	1.56-03	9.10-04	5.84-04	4.00-04	2.86-04	2.13-04	1.62-04	1.26-04	1.00-04	8.08-05	6.59-05	5.43-05
19	9.69-03	3.50-03	1.77-03	1.04-03	6.77-04	4.67-04	3.36-04	2.50-04	1.91-04	1.49-04	1.19-04	9.56-05	7.78-05	6.38-05
18	1.08-02	3.95-03	2.03-03	1.21-03	7.93-04	5.50-04	3.98-04	2.97-04	2.28-04	1.78-04	1.41-04	1.14-04	9.22-05	7.50-05
17	1.21-02	4.52-03	2.36-03	1.43-03	9.41-04	6.56-04	4.77-04	3.57-04	2.74-04	2.14-04	1.70-04	1.36-04	1.09-04	8.73-05
16	1.40-02	5.26-03	2.78-03	1.70-03	1.13-03	7.92-04	5.78-04	4.33-04	3.33-04	2.60-04	2.05-04	1.63-04	1.29-04	9.65-05
15	1.63-02	6.23-03	3.33-03	2.06-03	1.38-03	9.69-04	7.09-04	5.33-04	4.09-04	3.18-04	2.49-04	1.95-04	1.44-04	
14	1.96-02	7.53-03	4.07-03	2.53-03	1.70-03	1.20-03	8.82-04	6.63-04	5.08-04	3.92-04	3.02-04	2.21-04		
13	2.39-02	9.28-03	5.06-03	3.17-03	2.14-03	1.52-03	1.12-03	8.38-04	6.38-04	4.84-04	3.50-04			
12	3.00-02	1.17-02	6.44-03	4.06-03	2.76-03	1.96-03	1.44-03	1.08-03	8.06-04	5.74-04				
11	3.85-02	1.52-02	8.40-03	5.33-03	3.64-03	2.60-03	1.90-03	1.40-03	9.83-04					
10	5.09-02	2.02-02	1.13-02	7.23-03	4.96-03	3.53-03	2.55-03	1.77-03						
9	6.98-02	2.79-02	1.58-02	1.02-02	7.01-03	4.95-03	3.38-03							
8	9.98-02	4.04-02	2.31-02	1.51-02	1.03-02	6.95-03								
7	1.51-01	6.20-02	3.61-02	2.37-02	1.57-02									
6	2.47-01	1.04-01	6.17-02	3.97-02										
5	4.52-01	1.96-01	1.18-01											
4	1.00+00	4.51-01												
3	3.14+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.81-06	3.18-06	2.68-06	2.28-06	1.96-06	1.69-06	1.47-06	1.29-06	1.14-06	1.01-06	8.94-07	7.98-07	7.15-07	6.44-07
45	4.68-06	3.91-06	3.29-06	2.80-06	2.41-06	2.08-06	1.81-06	1.59-06	1.40-06	1.24-06	1.10-06	9.81-07	8.79-07	7.91-07
40	5.92-06	4.94-06	4.17-06	3.55-06	3.05-06	2.64-06	2.29-06	2.01-06	1.77-06	1.57-06	1.39-06	1.24-06	1.11-06	1.00-06
35	8.09-06	6.77-06	5.71-06	4.87-06	4.18-06	3.62-06	3.15-06	2.76-06	2.43-06	2.15-06	1.91-06	1.70-06	1.52-06	1.36-06
30	1.24-05	1.04-05	8.77-06	7.49-06	6.44-06	5.58-06	4.86-06	4.25-06	3.74-06	3.29-06	2.90-06	2.55-06	2.21-06	1.81-06
29	1.37-05	1.15-05	9.71-06	8.30-06	7.14-06	6.18-06	5.38-06	4.70-06	4.13-06	3.62-06	3.17-06	2.74-06	2.24-06	
28	1.52-05	1.28-05	1.08-05	9.25-06	7.95-06	6.89-06	5.99-06	5.23-06	4.57-06	3.98-06	3.43-06	2.79-06		
27	1.70-05	1.43-05	1.21-05	1.04-05	8.92-06	7.71-06	6.70-06	5.83-06	5.06-06	4.34-06	3.52-06			
26	1.92-05	1.61-05	1.37-05	1.17-05	1.01-05	8.68-06	7.51-06	6.49-06	5.54-06	4.48-06				
25	2.18-05	1.83-05	1.55-05	1.33-05	1.14-05	9.80-06	8.42-06	7.16-06	5.75-06					
24	2.49-05	2.09-05	1.77-05	1.51-05	1.29-05	1.11-05	9.35-06	7.47-06						
23	2.86-05	2.41-05	2.04-05	1.73-05	1.47-05	1.23-05	9.81-06							
22	3.31-05	2.78-05	2.34-05	1.98-05	1.65-05	1.30-05								
21	3.85-05	3.22-05	2.70-05	2.23-05	1.75-05									
20	4.50-05	3.73-05	3.07-05	2.39-05										
19	5.24-05	4.27-05	3.30-05											
18	6.05-05	4.63-05												
17	6.61-05													

H TE = 3.00+03 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-2.71-37	-2.94-36	-9.61-36	-2.35-35	-4.86-35	-9.01-35	-1.55-34	-2.50-34	-3.87-34	-5.79-34	-8.45-34	-1.21-33	-1.71-33
45	0.00+00	-1.65-37	-3.17-36	-1.05-35	-2.55-35	-5.22-35	-9.50-35	-1.60-34	-2.53-34	-3.82-34	-5.58-34	-7.95-34	-1.11-33	-1.55-33
40	0.00+00	5.31-38	-3.27-36	-1.12-35	-2.69-35	-5.34-35	-9.40-35	-1.51-34	-2.27-34	-3.21-34	-4.35-34	-5.67-34	-7.19-34	-8.96-34
35	0.00+00	4.57-37	-3.33-36	-1.20-35	-2.85-35	-5.48-35	-9.12-35	-1.35-34	-1.79-34	-2.09-34	-2.01-34	-1.22-34	8.14-35	4.78-34
30	0.00+00	1.34-36	-2.83-36	-1.20-35	-2.86-35	-5.24-35	-7.88-35	-9.54-35	-7.66-35	2.31-35	2.81-34	8.24-34	1.85-33	3.68-33
29	0.00+00	1.64-36	-2.50-36	-1.15-35	-2.76-35	-4.98-35	-7.21-35	-7.88-35	-3.88-35	1.04-34	4.46-34	1.15-33	2.47-33	4.84-33
28	0.00+00	2.02-36	-2.04-36	-1.07-35	-2.59-35	-4.59-35	-6.27-35	-5.72-35	8.60-36	2.04-34	6.49-34	1.55-33	3.24-33	6.29-33
27	0.00+00	2.47-36	-1.40-36	-9.54-36	-2.33-35	-4.02-35	-5.00-35	-2.94-35	6.77-35	3.26-34	8.96-34	2.03-33	4.19-33	8.12-33
26	0.00+00	3.03-36	-5.39-37	-7.83-36	-1.97-35	-3.24-35	-3.33-35	5.68-36	1.41-34	4.75-34	1.20-33	2.63-33	5.37-33	1.05-32
25	0.00+00	3.71-36	5.87-37	-5.48-36	-1.47-35	-2.20-35	-1.19-35	4.96-35	2.30-34	6.56-34	1.56-33	3.37-33	6.86-33	1.35-32
24	0.00+00	4.54-36	2.03-36	-2.38-36	-8.15-36	-8.44-36	1.54-35	1.04-34	3.39-34	8.75-34	2.00-33	4.27-33	8.71-33	1.74-32
23	0.00+00	5.55-36	3.86-36	1.62-36	3.61-37	8.83-36	4.94-35	1.71-34	4.70-34	1.14-33	2.54-33	5.40-33	1.11-32	2.26-32
22	0.00+00	6.76-36	6.13-36	6.58-36	1.12-35	3.06-35	9.18-35	2.52-34	6.29-34	1.46-33	3.20-33	6.80-33	1.42-32	2.98-32
21	0.00+00	8.23-36	8.91-36	1.30-35	2.48-35	5.79-35	1.44-34	3.52-34	8.23-34	1.84-33	4.01-33	8.60-33	1.84-32	4.02-32
20	0.00+00	9.99-36	1.23-35	2.06-35	4.18-35	9.22-35	2.10-34	4.77-34	1.06-33	2.33-33	5.05-33	1.10-32	2.43-32	5.60-32
19	0.00+00	1.21-35	1.64-35	3.05-35	6.31-35	1.36-34	2.94-34	6.36-34	1.37-33	2.95-33	6.40-33	1.42-32	3.29-32	8.23-32
18	0.00+00	1.47-35	2.15-35	4.26-35	9.02-35	1.92-34	4.04-34	8.47-34	1.78-33	3.79-33	8.27-33	1.89-32	4.67-32	1.32-31
17	0.00+00	1.79-35	2.77-35	5.78-35	1.25-34	2.67-34	5.54-34	1.14-33	2.36-33	4.99-33	1.10-32	2.62-32	7.07-32	2.42-31
16	0.00+00	2.20-35	3.56-35	7.76-35	1.73-34	3.71-34	7.70-34	1.58-33	3.28-33	6.85-33	1.53-32	3.78-32	1.11-31	4.62-31
15	0.00+00	2.72-35	4.59-35	1.04-34	2.39-34	5.23-34	1.10-33	2.27-33	4.69-33	9.94-33	2.20-32	4.88-32	-4.40-32	
14	0.00+00	3.41-35	5.99-35	1.42-34	3.37-34	7.60-34	1.65-33	3.48-33	7.34-33	1.53-32	2.53-32	-2.20-31		
13	0.00+00	4.37-35	7.96-35	1.97-34	4.90-34	1.16-33	2.63-33	5.86-33	1.27-32	2.10-32	-2.18-31			
12	0.00+00	5.72-35	1.09-34	2.84-34	7.19-34	1.90-33	4.66-33	1.13-32	2.35-32	-1.37-31				
11	0.00+00	7.73-35	1.54-34	4.32-34	1.23-33	3.45-33	9.60-33	2.61-32	-3.38-32					
10	0.00+00	1.08-34	2.30-34	7.06-34	2.27-33	7.41-33	2.56-32	5.57-32						
9	0.00+00	1.60-34	3.70-34	1.29-33	4.97-33	2.14-32	1.10-31							
8	0.00+00	2.52-34	6.60-34	2.82-33	1.51-32	1.22-31								
7	0.00+00	4.39-34	1.40-33	8.62-33	9.90-32									
6	0.00+00	8.90-34	4.08-33	5.96-32										
5	0.00+00	2.40-33	2.65-32											
4	0.00+00	1.29-32												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-2.40-33	-3.34-33	-4.64-33	-6.44-33	-8.95-33	-1.24-32	-1.73-32	-2.40-32	-3.32-32	-4.59-32	-6.33-32	-8.71-32	-1.20-31	-1.64-31
45	-2.14-33	-2.96-33	-4.13-33	-5.81-33	-8.24-33	-1.18-32	-1.70-32	-2.45-32	-3.56-32	-5.16-32	-7.48-32	-1.08-31	-1.57-31	-2.29-31
40	-1.11-33	-1.41-33	-1.85-33	-2.57-33	-3.80-33	-5.91-33	-9.51-33	-1.56-32	-2.57-32	-4.24-32	-6.96-32	-1.14-31	-1.87-31	-3.07-31
35	1.16-33	2.24-33	3.86-33	6.15-33	9.27-33	1.33-32	1.82-32	2.37-32	2.88-32	3.13-32	2.62-32	1.96-33	-6.91-32	-2.58-31
30	6.82-33	1.20-32	2.06-32	3.45-32	5.71-32	9.44-32	1.57-31	2.66-31	4.66-31	8.63-31	1.75-30	4.17-30	1.35-29	9.35-29
29	8.94-33	1.59-32	2.76-32	4.72-32	8.05-32	1.38-31	2.41-31	4.36-31	8.35-31	1.76-30	4.34-30	1.47-29	1.07-28	
28	1.17-32	2.10-32	3.71-32	6.51-32	1.15-31	2.07-31	3.84-31	7.56-31	1.64-30	4.16-30	1.45-29	1.09-28		
27	1.52-32	2.77-32	5.02-32	9.12-32	1.68-31	3.21-31	6.48-31	1.44-30	3.74-30	1.33-29	1.03-28			
26	1.98-32	3.70-32	6.90-32	1.31-31	2.55-31	5.27-31	1.20-30	3.18-30	1.16-29	9.09-29				
25	2.60-32	4.99-32	9.69-32	1.94-31	4.09-31	9.46-31	2.57-30	9.48-30	7.56-29					
24	3.44-32	6.85-32	1.40-31	3.02-31	7.12-31	1.96-30	7.36-30	5.94-29						
23	4.63-32	9.68-32	2.13-31	5.10-31	1.43-30	5.42-30	4.39-29							
22	6.38-32	1.43-31	3.48-31	9.87-31	3.77-30	3.06-29								
21	9.15-32	2.26-31	6.47-31	2.48-30	2.01-29									
20	1.40-31	4.02-31	1.54-30	1.23-29										
19	2.36-31	8.94-31	6.94-30											
18	4.84-31	3.54-30												
17	1.54-30													

H TE = 3.00+03 NE = 1.00+05 CASE B NC = 56

TOTAL RC = 6.893-13 4-2 IC = 8.304-14 4-2 EM = 3.393-25 2S RC = 1.950-13 2P RC = 4.943-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.11-03	6.49-04	2.79-04	1.45-04	8.43-05	5.34-05	3.60-05	2.53-05	1.85-05	1.40-05	1.08-05	8.48-06	6.80-06	5.54-06
45	2.77-03	8.50-04	3.66-04	1.89-04	1.10-04	7.00-05	4.71-05	3.32-05	2.43-05	1.83-05	1.41-05	1.11-05	8.91-06	7.25-06
40	3.63-03	1.11-03	4.79-04	2.48-04	1.45-04	9.17-05	6.18-05	4.35-05	3.18-05	2.40-05	1.85-05	1.46-05	1.17-05	9.51-06
35	4.69-03	1.44-03	6.20-04	3.22-04	1.88-04	1.19-04	8.02-05	5.65-05	4.14-05	3.12-05	2.41-05	1.90-05	1.52-05	1.24-05
30	6.12-03	1.89-03	8.13-04	4.23-04	2.47-04	1.57-04	1.06-04	7.48-05	5.47-05	4.13-05	3.19-05	2.51-05	2.02-05	1.64-05
29	6.51-03	2.01-03	8.66-04	4.51-04	2.64-04	1.68-04	1.13-04	7.99-05	5.85-05	4.41-05	3.41-05	2.69-05	2.16-05	1.76-05
28	6.96-03	2.15-03	9.27-04	4.83-04	2.83-04	1.80-04	1.21-04	8.58-05	6.29-05	4.75-05	3.67-05	2.89-05	2.32-05	1.89-05
27	7.46-03	2.31-03	9.98-04	5.20-04	3.05-04	1.94-04	1.31-04	9.28-05	6.80-05	5.14-05	3.97-05	3.13-05	2.52-05	2.05-05
26	8.04-03	2.49-03	1.08-03	5.63-04	3.31-04	2.11-04	1.43-04	1.01-04	7.41-05	5.60-05	4.33-05	3.42-05	2.75-05	2.24-05
25	8.70-03	2.70-03	1.17-03	6.14-04	3.61-04	2.31-04	1.56-04	1.11-04	8.13-05	6.15-05	4.76-05	3.76-05	3.02-05	2.46-05
24	9.44-03	2.94-03	1.28-03	6.72-04	3.97-04	2.54-04	1.72-04	1.22-04	8.99-05	6.80-05	5.27-05	4.17-05	3.35-05	2.73-05
23	1.03-02	3.21-03	1.41-03	7.40-04	4.38-04	2.81-04	1.91-04	1.36-04	1.00-04	7.59-05	5.89-05	4.66-05	3.75-05	3.06-05
22	1.12-02	3.52-03	1.55-03	8.19-04	4.87-04	3.13-04	2.14-04	1.52-04	1.12-04	8.54-05	6.64-05	5.26-05	4.23-05	3.46-05
21	1.22-02	3.86-03	1.71-03	9.12-04	5.45-04	3.52-04	2.41-04	1.72-04	1.28-04	9.71-05	7.56-05	6.00-05	4.83-05	3.95-05
20	1.33-02	4.26-03	1.90-03	1.02-03	6.14-04	3.99-04	2.74-04	1.97-04	1.46-04	1.12-04	8.71-05	6.92-05	5.58-05	4.55-05
19	1.45-02	4.70-03	2.13-03	1.15-03	6.98-04	4.57-04	3.16-04	2.28-04	1.70-04	1.30-04	1.02-04	8.08-05	6.51-05	5.31-05
18	1.58-02	5.21-03	2.39-03	1.31-03	8.03-04	5.29-04	3.68-04	2.67-04	2.00-04	1.53-04	1.20-04	9.55-05	7.69-05	6.24-05
17	1.73-02	5.80-03	2.71-03	1.51-03	9.35-04	6.22-04	4.36-04	3.18-04	2.39-04	1.84-04	1.44-04	1.14-04	9.16-05	7.31-05
16	1.91-02	6.53-03	3.12-03	1.76-03	1.11-03	7.42-04	5.24-04	3.84-04	2.89-04	2.23-04	1.75-04	1.38-04	1.09-04	8.19-05
15	2.13-02	7.44-03	3.63-03	2.09-03	1.33-03	9.02-04	6.41-04	4.71-04	3.56-04	2.74-04	2.14-04	1.66-04	1.24-04	
14	2.41-02	8.63-03	4.32-03	2.53-03	1.63-03	1.12-03	7.98-04	5.89-04	4.45-04	3.41-04	2.61-04	1.91-04		
13	2.80-02	1.02-02	5.25-03	3.13-03	2.04-03	1.41-03	1.01-03	7.48-04	5.62-04	4.24-04	3.06-04			
12	3.35-02	1.25-02	6.55-03	3.98-03	2.62-03	1.82-03	1.31-03	9.63-04	7.13-04	5.05-04				
11	4.14-02	1.58-02	8.43-03	5.19-03	3.45-03	2.40-03	1.72-03	1.25-03	8.70-04					
10	5.34-02	2.07-02	1.12-02	6.99-03	4.67-03	3.26-03	2.31-03	1.57-03						
9	7.18-02	2.82-02	1.55-02	9.78-03	6.56-03	4.53-03	3.03-03							
8	1.02-01	4.04-02	2.26-02	1.44-02	9.59-03	6.27-03								
7	1.53-01	6.17-02	3.51-02	2.23-02	1.42-02									
6	2.49-01	1.02-01	5.92-02	3.65-02										
5	4.55-01	1.92-01	1.10-01											
4	1.00+00	4.31-01												
3	3.09+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.57-06	3.81-06	3.21-06	2.73-06	2.34-06	2.02-06	1.76-06	1.54-06	1.36-06	1.20-06	1.07-06	9.52-07	8.54-07	7.68-07
45	5.98-06	4.99-06	4.21-06	3.58-06	3.07-06	2.65-06	2.31-06	2.02-06	1.78-06	1.57-06	1.40-06	1.25-06	1.12-06	1.00-06
40	7.84-06	6.54-06	5.51-06	4.69-06	4.02-06	3.47-06	3.02-06	2.64-06	2.32-06	2.05-06	1.82-06	1.63-06	1.46-06	1.31-06
35	1.02-05	8.51-06	7.17-06	6.10-06	5.23-06	4.51-06	3.92-06	3.43-06	3.01-06	2.66-06	2.36-06	2.10-06	1.87-06	1.68-06
30	1.35-05	1.13-05	9.52-06	8.09-06	6.93-06	5.98-06	5.19-06	4.52-06	3.96-06	3.48-06	3.06-06	2.68-06	2.32-06	1.90-06
29	1.45-05	1.21-05	1.02-05	8.66-06	7.41-06	6.39-06	5.54-06	4.83-06	4.22-06	3.69-06	3.22-06	2.78-06	2.26-06	
28	1.56-05	1.30-05	1.10-05	9.32-06	7.97-06	6.87-06	5.95-06	5.17-06	4.50-06	3.91-06	3.36-06	2.73-06		
27	1.69-05	1.41-05	1.19-05	1.01-05	8.63-06	7.43-06	6.42-06	5.56-06	4.81-06	4.11-06	3.32-06			
26	1.85-05	1.54-05	1.30-05	1.10-05	9.41-06	8.08-06	6.96-06	5.99-06	5.10-06	4.10-06				
25	2.03-05	1.70-05	1.43-05	1.21-05	1.03-05	8.84-06	7.56-06	6.40-06	5.13-06					
24	2.26-05	1.88-05	1.58-05	1.34-05	1.14-05	9.69-06	8.16-06	6.51-06						
23	2.53-05	2.10-05	1.77-05	1.49-05	1.26-05	1.06-05	8.38-06							
22	2.85-05	2.38-05	1.99-05	1.67-05	1.39-05	1.10-05								
21	3.25-05	2.70-05	2.25-05	1.86-05	1.46-05									
20	3.75-05	3.10-05	2.54-05	1.98-05										
19	4.34-05	3.54-05	2.73-05											
18	5.03-05	3.86-05												
17	5.56-05													

H TE = 3.00+03 NE = 1.00+05 CASE B NC = 56

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-5.58-37	-4.27-36	-1.39-35	-3.46-35	-7.37-35	-1.41-34	-2.52-34	-4.24-34	-6.86-34	-1.07-33	-1.64-33	-2.45-33	-3.62-33
45	0.00+00	-6.69-37	-5.46-36	-1.79-35	-4.45-35	-9.50-35	-1.83-34	-3.26-34	-5.52-34	-8.97-34	-1.41-33	-2.18-33	-3.30-33	-4.92-33
40	0.00+00	-7.12-37	-6.76-36	-2.24-35	-5.59-35	-1.19-34	-2.29-34	-4.10-34	-6.96-34	-1.14-33	-1.80-33	-2.81-33	-4.31-33	-6.54-33
35	0.00+00	-5.10-37	-7.76-36	-2.62-35	-6.55-35	-1.39-34	-2.65-34	-4.72-34	-7.97-34	-1.30-33	-2.08-33	-3.27-33	-5.11-33	-7.96-33
30	0.00+00	2.17-37	-7.98-36	-2.83-35	-7.02-35	-1.46-34	-2.71-34	-4.67-34	-7.65-34	-1.22-33	-1.91-33	-3.00-33	-4.76-33	-7.69-33
29	0.00+00	4.50-37	-7.96-36	-2.86-35	-7.09-35	-1.46-34	-2.69-34	-4.58-34	-7.40-34	-1.16-33	-1.80-33	-2.80-33	-4.44-33	-7.24-33
28	0.00+00	7.21-37	-7.92-36	-2.90-35	-7.16-35	-1.47-34	-2.67-34	-4.48-34	-7.10-34	-1.09-33	-1.66-33	-2.54-33	-4.01-33	-6.59-33
27	0.00+00	1.04-36	-7.87-36	-2.94-35	-7.25-35	-1.47-34	-2.64-34	-4.35-34	-6.74-34	-1.00-33	-1.48-33	-2.21-33	-3.43-33	-5.65-33
26	0.00+00	1.42-36	-7.78-36	-2.98-35	-7.35-35	-1.48-34	-2.61-34	-4.20-34	-6.28-34	-8.96-34	-1.25-33	-1.75-33	-2.61-33	-4.27-33
25	0.00+00	1.87-36	-7.62-36	-3.01-35	-7.43-35	-1.48-34	-2.56-34	-3.99-34	-5.69-34	-7.92-34	-9.34-34	-1.13-33	-1.43-33	-2.18-33
24	0.00+00	2.44-36	-7.33-36	-3.03-35	-7.47-35	-1.47-34	-2.49-34	-3.71-34	-4.89-34	-5.57-34	-5.01-34	-2.36-34	3.14-34	1.10-33
23	0.00+00	3.15-36	-6.83-36	-3.00-35	-7.43-35	-1.44-34	-2.36-34	-3.29-34	-3.76-34	-2.82-34	1.17-34	1.08-33	3.00-33	6.45-33
22	0.00+00	4.06-36	-6.01-36	-2.91-35	-7.24-35	-1.38-34	-2.15-34	-2.67-34	-2.13-34	1.13-34	1.02-33	3.07-33	7.29-33	1.56-32
21	0.00+00	5.23-36	-4.71-36	-2.71-35	-6.81-35	-1.26-34	-1.81-34	-1.76-34	2.18-35	6.87-34	2.37-33	6.17-33	1.44-32	3.19-32
20	0.00+00	6.77-36	-2.70-36	-2.35-35	-6.03-35	-1.06-34	-1.29-34	-4.11-35	3.64-34	1.53-33	4.43-33	1.12-32	2.66-32	6.33-32
19	0.00+00	8.78-36	2.97-37	-1.76-35	-4.72-35	-7.52-35	-5.17-35	1.56-34	8.63-34	2.80-33	7.65-33	1.95-32	4.93-32	1.30-31
18	0.00+00	1.14-35	4.64-36	-8.49-36	-2.68-35	-2.77-35	6.28-35	4.41-34	1.60-33	4.72-33	1.29-32	3.44-32	9.57-32	3.00-31
17	0.00+00	1.49-35	1.08-35	5.02-36	3.78-36	4.20-35	2.29-34	8.57-34	2.69-33	7.74-33	2.18-32	6.35-32	2.07-31	8.87-31
16	0.00+00	1.95-35	1.92-35	2.44-35	4.84-35	1.45-34	4.72-34	1.47-33	4.36-33	1.27-32	3.85-32	1.30-31	5.71-31	5.12-30
15	0.00+00	2.54-35	3.08-35	5.19-35	1.13-34	2.90-34	8.31-34	2.40-33	7.05-33	2.17-32	7.49-32	3.33-31	2.97-30	
14	0.00+00	3.33-35	4.64-35	9.07-35	2.07-34	5.20-34	1.39-33	3.91-33	1.18-32	4.04-32	1.78-31	1.52-30		
13	0.00+00	4.38-35	6.80-35	1.47-34	3.50-34	8.76-34	2.31-33	6.61-33	2.15-32	8.92-32	6.84-31			
12	0.00+00	5.83-35	9.85-35	2.30-34	5.79-34	1.49-33	4.06-33	1.23-32	4.56-32	2.72-31				
11	0.00+00	7.92-35	1.44-34	3.66-34	9.88-34	2.73-33	8.03-33	2.72-32	1.12-31					
10	0.00+00	1.11-34	2.18-34	6.11-34	1.83-33	5.74-33	2.00-32	7.25-32						
9	0.00+00	1.53-34	3.52-34	1.12-33	3.98-33	1.59-32	7.74-32							
8	0.00+00	2.56-34	6.25-34	2.43-33	1.17-32	8.33-32								
7	0.00+00	4.44-34	1.31-33	7.29-33	7.30-32									
6	0.00+00	8.99-34	3.78-33	4.84-32										
5	0.00+00	2.41-33	2.38-32											
4	0.00+00	1.28-32												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.25-33	-7.54-33	-1.07-32	-1.50-32	-2.07-32	-2.84-32	-3.86-32	-5.21-32	-6.97-32	-9.26-32	-1.22-31	-1.61-31	-2.10-31	-2.72-31
45	-7.24-33	-1.06-32	-1.52-32	-2.17-32	-3.07-32	-4.31-32	-6.01-32	-8.32-32	-1.15-31	-1.57-31	-2.15-31	-2.94-31	-4.00-31	-5.43-31
40	-9.84-33	-1.47-32	-2.18-32	-3.20-32	-4.68-32	-6.80-32	-9.85-32	-1.42-31	-2.06-31	-2.98-31	-4.32-31	-6.29-31	-9.23-31	-1.37-30
35	-1.24-32	-1.92-32	-2.97-32	-4.60-32	-7.11-32	-1.10-31	-1.71-31	-2.66-31	-4.21-31	-6.73-31	-1.10-30	-1.85-30	-3.21-30	-5.85-30
30	-1.26-32	-2.11-32	-3.58-32	-6.12-32	-1.06-31	-1.87-31	-3.38-31	-6.30-31	-1.24-30	-2.61-30	-6.13-30	-1.72-29	-6.68-29	-5.72-28
29	-1.21-32	-2.07-32	-3.62-32	-6.41-32	-1.16-31	-2.13-31	-4.06-31	-8.12-31	-1.74-30	-4.16-30	-1.18-29	-4.68-29	-4.08-28	
28	-1.12-32	-1.99-32	-3.60-32	-6.68-32	-1.27-31	-2.48-31	-5.07-31	-1.11-30	-2.70-30	-7.84-30	-3.15-29	-2.80-28		
27	-9.89-33	-1.82-32	-3.49-32	-6.87-32	-1.39-31	-2.95-31	-6.66-31	-1.66-30	-4.94-30	-2.02-29	-1.83-28			
26	-7.78-33	-1.53-32	-3.17-32	-6.84-32	-1.53-31	-3.63-31	-9.45-31	-2.90-30	-1.22-29	-1.14-28				
25	-4.25-33	-9.84-33	-2.44-32	-6.21-32	-1.64-31	-4.63-31	-1.51-30	-6.72-30	-6.50-29					
24	1.67-33	3.99-34	-7.80-33	-3.92-32	-1.52-31	-6.00-31	-3.02-30	-3.20-29						
23	1.21-32	2.06-32	3.11-32	3.43-32	-3.01-32	-6.46-31	-1.03-29							
22	3.16-32	6.35-32	1.31-31	2.90-31	7.65-31	3.08-30								
21	7.07-32	1.64-31	4.30-31	1.47-30	1.03-29									
20	1.58-31	4.47-31	1.67-30	1.31-29										
19	3.90-31	1.54-30	1.28-29											
18	1.24-30	1.07-29												
17	7.86-30													

H TE = 3.00+03 NE = 1.00+06 CASE B NC = 36

TOTAL RC = 7.096-13 4-2 RC = 8.581-14 4-2 EM = 3.507-25 2S RC = 2.047-13 2P RC = 5.049-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.17-03	6.67-04	2.87-04	1.48-04	8.66-05	5.48-05	3.69-05	2.60-05	1.90-05	1.43-05	1.10-05	8.70-06	6.98-06	5.68-06
45	2.96-03	9.09-04	3.91-04	2.02-04	1.18-04	7.47-05	5.03-05	3.54-05	2.59-05	1.95-05	1.51-05	1.19-05	9.50-06	7.73-06
40	4.15-03	1.27-03	5.47-04	2.84-04	1.65-04	1.05-04	7.05-05	4.96-05	3.63-05	2.73-05	2.11-05	1.66-05	1.33-05	1.08-05
35	5.93-03	1.82-03	7.82-04	4.05-04	2.36-04	1.50-04	1.01-04	7.10-05	5.19-05	3.90-05	3.01-05	2.37-05	1.90-05	1.55-05
30	8.53-03	2.62-03	1.12-03	5.83-04	3.40-04	2.15-04	1.45-04	1.02-04	7.46-05	5.61-05	4.33-05	3.41-05	2.73-05	2.22-05
29	9.14-03	2.81-03	1.21-03	6.25-04	3.65-04	2.31-04	1.55-04	1.09-04	8.00-05	6.02-05	4.64-05	3.65-05	2.93-05	2.38-05
28	9.78-03	3.00-03	1.29-03	6.69-04	3.90-04	2.47-04	1.66-04	1.17-04	8.56-05	6.45-05	4.97-05	3.91-05	3.13-05	2.55-05
27	1.05-02	3.21-03	1.38-03	7.15-04	4.17-04	2.64-04	1.78-04	1.25-04	9.16-05	6.89-05	5.31-05	4.18-05	3.35-05	2.72-05
26	1.12-02	3.42-03	1.47-03	7.63-04	4.45-04	2.82-04	1.90-04	1.34-04	9.78-05	7.36-05	5.68-05	4.47-05	3.58-05	2.91-05
25	1.19-02	3.65-03	1.57-03	8.14-04	4.75-04	3.01-04	2.03-04	1.43-04	1.04-04	7.86-05	6.06-05	4.77-05	3.82-05	3.10-05
24	1.27-02	3.90-03	1.68-03	8.70-04	5.08-04	3.22-04	2.17-04	1.53-04	1.12-04	8.40-05	6.48-05	5.10-05	4.08-05	3.31-05
23	1.36-02	4.17-03	1.80-03	9.32-04	5.45-04	3.45-04	2.33-04	1.64-04	1.20-04	9.02-05	6.95-05	5.47-05	4.38-05	3.55-05
22	1.46-02	4.49-03	1.94-03	1.01-03	5.87-04	3.73-04	2.51-04	1.77-04	1.29-04	9.74-05	7.51-05	5.91-05	4.72-05	3.83-05
21	1.58-02	4.87-03	2.10-03	1.09-03	6.39-04	4.06-04	2.73-04	1.93-04	1.41-04	1.06-04	8.18-05	6.44-05	5.15-05	4.17-05
20	1.73-02	5.33-03	2.30-03	1.20-03	7.02-04	4.46-04	3.01-04	2.12-04	1.55-04	1.17-04	9.02-05	7.09-05	5.66-05	4.58-05
19	1.91-02	5.89-03	2.55-03	1.33-03	7.80-04	4.96-04	3.35-04	2.37-04	1.73-04	1.31-04	1.01-04	7.91-05	6.31-05	5.09-05
18	2.12-02	6.57-03	2.86-03	1.49-03	8.78-04	5.59-04	3.78-04	2.68-04	1.96-04	1.48-04	1.14-04	8.95-05	7.12-05	5.71-05
17	2.37-02	7.40-03	3.23-03	1.69-03	9.99-04	6.39-04	4.33-04	3.07-04	2.25-04	1.70-04	1.31-04	1.03-04	8.11-05	6.41-05
16	2.67-02	8.39-03	3.68-03	1.94-03	1.15-03	7.40-04	5.03-04	3.57-04	2.63-04	1.98-04	1.53-04	1.19-04	9.28-05	6.92-05
15	3.02-02	9.58-03	4.25-03	2.26-03	1.35-03	8.70-04	5.95-04	4.24-04	3.12-04	2.36-04	1.81-04	1.39-04	1.02-04	
14	3.43-02	1.10-02	4.95-03	2.67-03	1.61-03	1.04-03	7.18-04	5.14-04	3.79-04	2.85-04	2.16-04	1.57-04		
13	3.91-02	1.28-02	5.86-03	3.21-03	1.95-03	1.28-03	8.88-04	6.38-04	4.70-04	3.50-04	2.51-04			
12	4.50-02	1.51-02	7.08-03	3.95-03	2.44-03	1.62-03	1.13-03	8.12-04	5.93-04	4.18-04				
11	5.28-02	1.82-02	8.80-03	5.02-03	3.16-03	2.12-03	1.48-03	1.05-03	7.28-04					
10	6.39-02	2.27-02	1.13-02	6.63-03	4.23-03	2.85-03	1.98-03	1.33-03						
9	8.11-02	2.97-02	1.53-02	9.15-03	5.90-03	3.96-03	2.60-03							
8	1.09-01	4.13-02	2.19-02	1.33-02	8.56-03	5.45-03								
7	1.59-01	6.17-02	3.35-02	2.04-02	1.25-02									
6	2.54-01	1.01-01	5.55-02	3.26-02										
5	4.59-01	1.86-01	1.00-01											
4	1.00+00	4.03-01												
3	3.01+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.68-06	3.91-06	3.29-06	2.80-06	2.40-06	2.08-06	1.81-06	1.58-06	1.39-06	1.23-06	1.09-06	9.76-07	8.75-07	7.87-07
45	6.38-06	5.32-06	4.48-06	3.81-06	3.27-06	2.82-06	2.46-06	2.15-06	1.89-06	1.67-06	1.49-06	1.33-06	1.19-06	1.07-06
40	8.92-06	7.44-06	6.27-06	5.33-06	4.57-06	3.95-06	3.43-06	3.00-06	2.64-06	2.33-06	2.07-06	1.84-06	1.65-06	1.48-06
35	1.27-05	1.06-05	8.95-06	7.60-06	6.51-06	5.62-06	4.88-06	4.27-06	3.75-06	3.31-06	2.93-06	2.61-06	2.33-06	2.08-06
30	1.83-05	1.52-05	1.28-05	1.09-05	9.31-06	8.02-06	6.95-06	6.05-06	5.30-06	4.65-06	4.08-06	3.57-06	3.08-06	2.52-06
29	1.96-05	1.63-05	1.37-05	1.17-05	9.97-06	8.58-06	7.43-06	6.46-06	5.64-06	4.93-06	4.29-06	3.70-06	3.01-06	
28	2.10-05	1.75-05	1.47-05	1.25-05	1.06-05	9.16-06	7.92-06	6.87-06	5.97-06	5.18-06	4.44-06	3.60-06		
27	2.24-05	1.87-05	1.57-05	1.33-05	1.13-05	9.75-06	8.41-06	7.27-06	6.28-06	5.35-06	4.32-06			
26	2.39-05	1.99-05	1.67-05	1.42-05	1.21-05	1.03-05	8.89-06	7.63-06	6.48-06	5.20-06				
25	2.55-05	2.12-05	1.78-05	1.51-05	1.28-05	1.09-05	9.34-06	7.88-06	6.30-06					
24	2.72-05	2.26-05	1.90-05	1.60-05	1.36-05	1.15-05	9.66-06	7.68-06						
23	2.92-05	2.42-05	2.03-05	1.70-05	1.43-05	1.20-05	9.46-06							
22	3.15-05	2.61-05	2.17-05	1.81-05	1.50-05	1.18-05								
21	3.42-05	2.82-05	2.33-05	1.92-05	1.50-05									
20	3.74-05	3.07-05	2.50-05	1.94-05										
19	4.13-05	3.33-05	2.56-05											
18	4.56-05	3.47-05												
17	4.83-05													

H TE = 3.00+03 NE = 1.00+06 CASE B NC = 36

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-6.21-37	-4.68-36	-1.53-35	-3.86-35	-8.34-35	-1.62-34	-2.94-34	-5.04-34	-8.28-34	-1.31-33	-2.02-33	-3.03-33	-4.43-33
45	0.00+00	-8.40-37	-6.39-36	-2.10-35	-5.32-35	-1.15-34	-2.26-34	-4.12-34	-7.11-34	-1.18-33	-1.88-33	-2.93-33	-4.45-33	-6.59-33
40	0.00+00	-1.15-36	-8.95-36	-2.96-35	-7.53-35	-1.64-34	-3.24-34	-5.95-34	-1.04-33	-1.74-33	-2.83-33	-4.46-33	-6.88-33	-1.04-32
35	0.00+00	-1.52-36	-1.26-35	-4.21-35	-1.08-34	-2.37-34	-4.73-34	-8.79-34	-1.55-33	-2.65-33	-4.39-33	-7.10-33	-1.13-32	-1.75-32
30	0.00+00	-1.72-36	-1.72-35	-5.86-35	-1.52-34	-3.37-34	-6.79-34	-1.28-33	-2.32-33	-4.07-33	-6.96-33	-1.17-32	-1.93-32	-3.16-32
29	0.00+00	-1.67-36	-1.81-35	-6.19-35	-1.60-34	-3.57-34	-7.23-34	-1.37-33	-2.49-33	-4.40-33	-7.59-33	-1.29-32	-2.16-32	-3.58-32
28	0.00+00	-1.56-36	-1.88-35	-6.50-35	-1.69-34	-3.77-34	-7.65-34	-1.46-33	-2.66-33	-4.73-33	-8.25-33	-1.42-32	-2.41-32	-4.06-32
27	0.00+00	-1.37-36	-1.94-35	-6.78-35	-1.77-34	-3.95-34	-8.03-34	-1.54-33	-2.82-33	-5.06-33	-8.92-33	-1.55-32	-2.68-32	-4.61-32
26	0.00+00	-1.09-36	-1.99-35	-7.01-35	-1.83-34	-4.10-34	-8.36-34	-1.61-33	-2.97-33	-5.37-33	-9.58-33	-1.69-32	-2.98-32	-5.25-32
25	0.00+00	-6.91-37	-2.01-35	-7.20-35	-1.89-34	-4.23-34	-8.62-34	-1.66-33	-3.09-33	-5.65-33	-1.02-32	-1.84-32	-3.31-32	-5.98-32
24	0.00+00	-1.65-37	-2.02-35	-7.33-35	-1.93-34	-4.32-34	-8.81-34	-1.70-33	-3.19-33	-5.90-33	-1.08-32	-1.99-32	-3.68-32	-6.86-32
23	0.00+00	5.05-37	-2.00-35	-7.42-35	-1.95-34	-4.38-34	-8.94-34	-1.73-33	-3.26-33	-6.10-33	-1.14-32	-2.15-32	-4.10-32	-7.95-32
22	0.00+00	1.34-36	-1.97-35	-7.48-35	-1.98-34	-4.42-34	-9.01-34	-1.75-33	-3.31-33	-6.27-33	-1.20-32	-2.33-32	-4.61-32	-9.39-32
21	0.00+00	2.36-36	-1.92-35	-7.54-35	-2.00-34	-4.46-34	-9.06-34	-1.75-33	-3.34-33	-6.41-33	-1.26-32	-2.53-32	-5.27-32	-1.15-31
20	0.00+00	3.61-36	-1.86-35	-7.62-35	-2.03-34	-4.51-34	-9.10-34	-1.75-33	-3.35-33	-6.53-33	-1.32-32	-2.78-32	-6.18-32	-1.47-31
19	0.00+00	5.17-36	-1.78-35	-7.70-35	-2.06-34	-4.56-34	-9.12-34	-1.74-33	-3.32-33	-6.56-33	-1.37-32	-3.09-32	-7.50-32	-2.03-31
18	0.00+00	7.18-36	-1.66-35	-7.74-35	-2.09-34	-4.59-34	-9.03-34	-1.69-33	-3.19-33	-6.37-33	-1.39-32	-3.41-32	-9.49-32	-3.15-31
17	0.00+00	9.85-36	-1.46-35	-7.66-35	-2.09-34	-4.54-34	-8.69-34	-1.56-33	-2.82-33	-5.53-33	-1.27-32	-3.54-32	-1.23-31	-6.01-31
16	0.00+00	1.35-35	-1.10-35	-7.27-35	-2.02-34	-4.30-34	-7.77-34	-1.25-33	-1.89-33	-3.00-33	-6.50-33	-2.35-32	-1.39-31	-1.81-30
15	0.00+00	1.86-35	-4.92-36	-6.32-35	-1.82-34	-3.68-34	-5.67-34	-5.50-34	3.98-34	4.37-33	1.85-32	7.56-32	4.89-31	
14	0.00+00	2.60-35	5.56-36	-4.33-35	-1.35-34	-2.31-34	-1.17-34	1.02-33	6.16-33	2.77-32	1.39-31	1.32-30		
13	0.00+00	3.67-35	2.31-35	-5.35-36	-3.94-35	4.84-35	8.34-34	4.67-33	2.24-32	1.23-31	1.29-30			
12	0.00+00	5.24-35	5.20-35	6.34-35	1.44-34	6.13-34	2.92-33	1.42-32	8.22-32	9.07-31				
11	0.00+00	7.58-35	9.89-35	1.86-34	4.99-34	1.81-33	8.05-33	4.61-32	5.10-31					
10	0.00+00	1.11-34	1.76-34	4.11-34	1.23-33	4.69-33	2.44-32	2.47-31						
9	0.00+00	1.68-34	3.11-34	8.66-34	3.02-33	1.40-32	1.20-31							
8	0.00+00	2.66-34	5.76-34	1.98-33	9.08-33	7.20-32								
7	0.00+00	4.60-34	1.21-33	5.89-33	5.34-32									
6	0.00+00	9.24-34	3.43-33	3.72-32										
5	0.00+00	2.45-33	2.07-32											
4	0.00+00	1.29-32												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-6.35-33	-8.91-33	-1.23-32	-1.66-32	-2.21-32	-2.88-32	-3.69-32	-4.63-32	-5.71-32	-6.93-32	-8.30-32	-9.81-32	-1.15-31	-1.34-31
45	-9.57-33	-1.36-32	-1.91-32	-2.64-32	-3.58-32	-4.77-32	-6.26-32	-8.08-32	-1.03-31	-1.29-31	-1.59-31	-1.96-31	-2.39-31	-2.93-31
40	-1.54-32	-2.25-32	-3.24-32	-4.59-32	-6.42-32	-8.87-32	-1.21-31	-1.63-31	-2.16-31	-2.85-31	-3.75-31	-4.92-31	-6.48-31	-8.62-31
35	-2.68-32	-4.06-32	-6.09-32	-9.04-32	-1.33-31	-1.95-31	-2.84-31	-4.12-31	-5.96-31	-8.68-31	-1.28-30	-1.92-30	-2.98-30	-4.87-30
30	-5.13-32	-8.30-32	-1.34-31	-2.17-31	-3.54-31	-5.84-31	-9.77-31	-1.68-30	-2.99-30	-5.68-30	-1.19-29	-2.97-29	-1.02-28	-7.70-28
29	-5.91-32	-9.74-32	-1.61-31	-2.68-31	-4.51-31	-7.74-31	-1.36-30	-2.49-30	-4.84-30	-1.04-29	-2.63-29	-9.18-29	-7.04-28	
28	-6.84-32	-1.15-31	-1.96-31	-3.36-31	-5.90-31	-1.06-30	-1.99-30	-3.97-30	-8.72-30	-2.26-29	-8.04-29	-6.27-28		
27	-7.94-32	-1.37-31	-2.41-31	-4.31-31	-7.95-31	-1.53-30	-3.12-30	-7.03-30	-1.87-29	-6.79-29	-5.40-28			
26	-9.27-32	-1.66-31	-3.03-31	-5.69-31	-1.12-30	-2.34-30	-5.42-30	-1.48-29	-5.51-29	-4.49-28				
25	-1.09-31	-2.03-31	-3.90-31	-7.81-31	-1.67-30	-3.97-30	-1.11-29	-4.26-29	-3.56-28					
24	-1.30-31	-2.55-31	-5.21-31	-1.14-30	-2.76-30	-7.93-30	-3.12-29	-2.68-28						
23	-1.59-31	-3.31-31	-7.37-31	-1.82-30	-5.36-30	-2.16-29	-1.91-28							
22	-2.00-31	-4.54-31	-1.15-30	-3.43-30	-1.42-29	-1.29-28								
21	-2.66-31	-6.84-31	-2.09-30	-8.81-30	-8.17-29									
20	-3.87-31	-1.21-30	-5.18-30	-4.91-29										
19	-6.50-31	-2.87-30	-2.78-29											
18	-1.44-30	-1.44-29												
17	-6.39-30													

H TE = 3.00+03 NE = 1.00+07 CASE B NC = 23

TOTAL RC = 7.476-13 4-2 RC = 9.072-14 4-2 EM = 3.707-25 2S RC = 2.211-13 2P RC = 5.265-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.08-03	6.38-04	2.74-04	1.42-04	8.28-05	5.25-05	3.53-05	2.49-05	1.82-05	1.37-05	1.06-05	8.33-06	6.68-06	5.43-06
45	2.86-03	8.77-04	3.77-04	1.95-04	1.14-04	7.22-05	4.85-05	3.42-05	2.50-05	1.88-05	1.45-05	1.14-05	9.17-06	7.46-06
40	4.08-03	1.25-03	5.38-04	2.79-04	1.63-04	1.03-04	6.92-05	4.88-05	3.57-05	2.68-05	2.07-05	1.63-05	1.31-05	1.06-05
35	6.09-03	1.87-03	8.03-04	4.16-04	2.42-04	1.53-04	1.03-04	7.27-05	5.31-05	4.00-05	3.09-05	2.43-05	1.95-05	1.58-05
30	9.56-03	2.93-03	1.26-03	6.52-04	3.80-04	2.41-04	1.62-04	1.14-04	8.32-05	6.26-05	4.83-05	3.80-05	3.04-05	2.47-05
29	1.05-02	3.23-03	1.39-03	7.18-04	4.18-04	2.65-04	1.78-04	1.25-04	9.16-05	6.89-05	5.31-05	4.18-05	3.35-05	2.72-05
28	1.16-02	3.56-03	1.53-03	7.91-04	4.61-04	2.92-04	1.96-04	1.38-04	1.01-04	7.59-05	5.85-05	4.60-05	3.68-05	2.99-05
27	1.28-02	3.93-03	1.69-03	8.73-04	5.09-04	3.22-04	2.17-04	1.53-04	1.11-04	8.38-05	6.45-05	5.08-05	4.06-05	3.30-05
26	1.42-02	4.34-03	1.86-03	9.65-04	5.62-04	3.56-04	2.39-04	1.69-04	1.23-04	9.25-05	7.12-05	5.60-05	4.48-05	3.64-05
25	1.56-02	4.80-03	2.06-03	1.07-03	6.21-04	3.93-04	2.64-04	1.86-04	1.36-04	1.02-04	7.86-05	6.18-05	4.94-05	4.01-05
24	1.73-02	5.30-03	2.28-03	1.18-03	6.86-04	4.34-04	2.92-04	2.05-04	1.50-04	1.13-04	8.67-05	6.81-05	5.45-05	4.42-05
23	1.89-02	5.81-03	2.49-03	1.29-03	7.52-04	4.76-04	3.20-04	2.25-04	1.64-04	1.24-04	9.51-05	7.47-05	5.97-05	4.84-05
22	2.08-02	6.38-03	2.74-03	1.42-03	8.26-04	5.23-04	3.51-04	2.47-04	1.80-04	1.36-04	1.04-04	8.20-05	6.55-05	5.30-05
21	2.27-02	6.97-03	3.00-03	1.55-03	9.04-04	5.72-04	3.84-04	2.70-04	1.97-04	1.48-04	1.14-04	8.95-05	7.14-05	5.77-05
20	2.47-02	7.59-03	3.26-03	1.69-03	9.84-04	6.23-04	4.18-04	2.94-04	2.15-04	1.61-04	1.24-04	9.72-05	7.74-05	6.25-05
19	2.68-02	8.23-03	3.54-03	1.83-03	1.07-03	6.75-04	4.54-04	3.19-04	2.33-04	1.75-04	1.34-04	1.05-04	8.35-05	6.71-05
18	2.90-02	8.90-03	3.83-03	1.98-03	1.16-03	7.31-04	4.91-04	3.45-04	2.52-04	1.89-04	1.45-04	1.13-04	8.97-05	7.16-05
17	3.15-02	9.67-03	4.16-03	2.15-03	1.26-03	7.95-04	5.34-04	3.75-04	2.73-04	2.05-04	1.57-04	1.22-04	9.61-05	7.55-05
16	3.45-02	1.06-02	4.56-03	2.37-03	1.38-03	8.74-04	5.87-04	4.12-04	3.00-04	2.26-04	1.71-04	1.33-04	1.03-04	7.59-05
15	3.84-02	1.18-02	5.09-03	2.64-03	1.54-03	9.78-04	6.57-04	4.61-04	3.35-04	2.50-04	1.90-04	1.44-04	1.05-04	
14	4.36-02	1.34-02	5.80-03	3.02-03	1.76-03	1.12-03	7.51-04	5.27-04	3.82-04	2.83-04	2.12-04	1.52-04		
13	5.03-02	1.56-02	6.75-03	3.52-03	2.06-03	1.31-03	8.80-04	6.17-04	4.45-04	3.25-04	2.29-04			
12	5.90-02	1.84-02	8.01-03	4.20-03	2.47-03	1.57-03	1.06-03	7.40-04	5.27-04	3.64-04				
11	7.02-02	2.21-02	9.73-03	5.14-03	3.05-03	1.95-03	1.31-03	9.06-04	6.12-04					
10	8.47-02	2.71-02	1.21-02	6.51-03	3.89-03	2.50-03	1.67-03	1.10-03						
9	1.04-01	3.42-02	1.57-02	8.59-03	5.20-03	3.34-03	2.13-03							
8	1.33-01	4.50-02	2.14-02	1.20-02	7.32-03	4.51-03								
7	1.81-01	6.36-02	3.14-02	1.79-02	1.06-02									
6	2.73-01	9.93-02	5.06-02	2.80-02										
5	4.72-01	1.77-01	8.87-02											
4	1.00+00	3.69-01												
3	2.91+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.48-06	3.74-06	3.15-06	2.68-06	2.30-06	1.99-06	1.73-06	1.51-06	1.33-06	1.18-06	1.05-06	9.34-07	8.37-07	7.53-07
45	6.16-06	5.13-06	4.33-06	3.68-06	3.16-06	2.73-06	2.37-06	2.07-06	1.82-06	1.61-06	1.43-06	1.28-06	1.15-06	1.03-06
40	8.77-06	7.31-06	6.16-06	5.24-06	4.49-06	3.88-06	3.37-06	2.95-06	2.59-06	2.29-06	2.03-06	1.81-06	1.62-06	1.46-06
35	1.30-05	1.09-05	9.16-06	7.78-06	6.67-06	5.75-06	5.00-06	4.36-06	3.83-06	3.38-06	3.00-06	2.67-06	2.38-06	2.13-06
30	2.04-05	1.70-05	1.43-05	1.21-05	1.04-05	8.92-06	7.73-06	6.73-06	5.88-06	5.16-06	4.53-06	3.96-06	3.42-06	2.79-06
29	2.24-05	1.86-05	1.57-05	1.33-05	1.14-05	9.78-06	8.46-06	7.36-06	6.42-06	5.61-06	4.88-06	4.20-06	3.41-06	
28	2.46-05	2.05-05	1.72-05	1.46-05	1.25-05	1.07-05	9.27-06	8.04-06	6.99-06	6.06-06	5.18-06	4.19-06		
27	2.71-05	2.26-05	1.90-05	1.61-05	1.37-05	1.18-05	1.01-05	8.76-06	7.56-06	6.44-06	5.19-06			
26	2.99-05	2.49-05	2.09-05	1.77-05	1.51-05	1.29-05	1.11-05	9.49-06	8.04-06	6.45-06				
25	3.30-05	2.74-05	2.30-05	1.94-05	1.65-05	1.41-05	1.20-05	1.01-05	8.05-06					
24	3.63-05	3.01-05	2.52-05	2.12-05	1.80-05	1.52-05	1.27-05	1.01-05						
23	3.97-05	3.29-05	2.75-05	2.31-05	1.94-05	1.62-05	1.28-05							
22	4.34-05	3.59-05	2.99-05	2.49-05	2.06-05	1.61-05								
21	4.72-05	3.89-05	3.21-05	2.63-05	2.05-05									
20	5.09-05	4.16-05	3.38-05	2.61-05										
19	5.43-05	4.37-05	3.34-05											
18	5.69-05	4.31-05												
17	5.65-05													

H TE = 3.00+03 NE = 1.00+07 CASE B NC = 23

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-5.81-37	-4.73-36	-1.57-35	-4.00-35	-8.71-35	-1.71-34	-3.09-34	-5.29-34	-8.59-34	-1.34-33	-2.00-33	-2.88-33	-4.00-33
45	0.00+00	-8.07-37	-6.55-36	-2.19-35	-5.59-35	-1.22-34	-2.41-34	-4.40-34	-7.57-34	-1.24-33	-1.95-33	-2.95-33	-4.30-33	-6.05-33
40	0.00+00	-1.16-36	-9.44-36	-3.17-35	-8.14-35	-1.79-34	-3.56-34	-6.56-34	-1.14-33	-1.90-33	-3.02-33	-4.64-33	-6.89-33	-9.90-33
35	0.00+00	-1.75-36	-1.43-35	-4.82-35	-1.25-34	-2.77-34	-5.58-34	-1.04-33	-1.85-33	-3.12-33	-5.08-33	-8.00-33	-1.22-32	-1.81-32
30	0.00+00	-2.72-36	-2.27-35	-7.74-35	-2.03-34	-4.59-34	-9.40-34	-1.80-33	-3.27-33	-5.69-33	-9.59-33	-1.57-32	-2.51-32	-3.91-32
29	0.00+00	-2.97-36	-2.50-35	-8.56-35	-2.25-34	-5.11-34	-1.05-33	-2.03-33	-3.71-33	-6.51-33	-1.11-32	-1.83-32	-2.97-32	-4.70-32
28	0.00+00	-3.24-36	-2.76-35	-9.49-35	-2.51-34	-5.71-34	-1.18-33	-2.29-33	-4.23-33	-7.50-33	-1.29-32	-2.16-32	-3.55-32	-5.71-32
27	0.00+00	-3.52-36	-3.05-35	-1.05-34	-2.79-34	-6.40-34	-1.33-33	-2.60-33	-4.84-33	-8.67-33	-1.51-32	-2.57-32	-4.29-32	-7.03-32
26	0.00+00	-3.79-36	-3.36-35	-1.17-34	-3.11-34	-7.17-34	-1.50-33	-2.96-33	-5.56-33	-1.01-32	-1.78-32	-3.08-32	-5.24-32	-8.80-32
25	0.00+00	-4.05-36	-3.70-35	-1.29-34	-3.47-34	-8.04-34	-1.70-33	-3.38-33	-6.42-33	-1.18-32	-2.12-32	-3.73-32	-6.50-32	-1.12-31
24	0.00+00	-4.25-36	-4.07-35	-1.43-34	-3.86-34	-9.00-34	-1.92-33	-3.86-33	-7.42-33	-1.39-32	-2.53-32	-4.57-32	-8.18-32	-1.46-31
23	0.00+00	-4.24-36	-4.39-35	-1.56-34	-4.23-34	-9.96-34	-2.15-33	-4.36-33	-8.53-33	-1.62-32	-3.03-32	-5.62-32	-1.04-31	-1.93-31
22	0.00+00	-4.14-36	-4.73-35	-1.70-34	-4.66-34	-1.11-33	-2.41-33	-4.96-33	-9.88-33	-1.92-32	-3.69-32	-7.05-32	-1.36-31	-2.65-31
21	0.00+00	-3.77-36	-5.04-35	-1.84-34	-5.08-34	-1.22-33	-2.68-33	-5.62-33	-1.14-32	-2.28-32	-4.51-32	-8.98-32	-1.82-31	-3.80-31
20	0.00+00	-3.00-36	-5.27-35	-1.96-34	-5.46-34	-1.32-33	-2.96-33	-6.32-33	-1.32-32	-2.70-32	-5.57-32	-1.17-31	-2.52-31	-5.75-31
19	0.00+00	-1.70-36	-5.40-35	-2.05-34	-5.80-34	-1.42-33	-3.23-33	-7.05-33	-1.51-32	-3.22-32	-6.97-32	-1.56-31	-3.67-31	-9.49-31
18	0.00+00	2.75-37	-5.40-35	-2.12-34	-6.07-34	-1.51-33	-3.49-33	-7.81-33	-1.73-32	-3.87-32	-8.91-32	-2.17-31	-5.79-31	-1.82-30
17	0.00+00	3.04-36	-5.27-35	-2.16-34	-6.28-34	-1.58-33	-3.74-33	-8.64-33	-2.00-32	-4.75-32	-1.19-31	-3.26-31	-1.06-30	-4.67-30
16	0.00+00	6.72-36	-5.05-35	-2.19-34	-6.49-34	-1.67-33	-4.03-33	-9.65-33	-2.36-32	-6.08-32	-1.71-31	-5.69-31	-2.59-30	-2.57-29
15	0.00+00	1.15-35	-4.75-35	-2.23-34	-6.76-34	-1.77-33	-4.40-33	-1.11-32	-2.93-32	-8.46-32	-2.87-31	-1.34-30	-1.36-29	
14	0.00+00	1.80-35	-4.34-35	-2.28-34	-7.13-34	-1.91-33	-4.93-33	-1.32-32	-3.91-32	-1.36-31	-6.45-31	-6.71-30		
13	0.00+00	2.71-35	-3.69-35	-2.33-34	-7.57-34	-2.09-33	-5.65-33	-1.67-32	-5.85-32	-2.84-31	-3.03-30			
12	0.00+00	4.06-35	-2.47-35	-2.30-34	-7.93-34	-2.26-33	-6.47-33	-2.19-32	-1.06-31	-1.15-30				
11	0.00+00	6.16-35	-1.63-37	-2.02-34	-7.68-34	-2.23-33	-6.55-33	-2.67-32	-2.69-31					
10	0.00+00	9.63-35	5.11-35	-1.07-34	-5.22-34	-1.16-33	3.70-34	5.36-32						
9	0.00+00	1.56-34	1.60-34	1.71-34	5.10-34	5.62-33	1.06-31							
8	0.00+00	2.65-34	4.02-34	9.99-34	5.14-33	7.37-32								
7	0.00+00	4.79-34	1.01-33	4.11-33	4.41-32									
6	0.00+00	9.76-34	3.03-33	2.84-32										
5	0.00+00	2.57-33	1.77-32											
4	0.00+00	1.31-32												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.34-33	-6.82-33	-8.35-33	-9.80-33	-1.11-32	-1.22-32	-1.30-32	-1.36-32	-1.36-32	-1.35-32	-1.32-32	-1.24-32	-1.12-32	-9.45-33
45	-8.20-33	-1.07-32	-1.33-32	-1.59-32	-1.85-32	-2.08-32	-2.29-32	-2.47-32	-2.58-32	-2.69-32	-2.77-32	-2.80-32	-2.77-32	-2.66-32
40	-1.37-32	-1.82-32	-2.34-32	-2.89-32	-3.47-32	-4.06-32	-4.67-32	-5.32-32	-5.88-32	-6.57-32	-7.33-32	-8.16-32	-9.09-32	-1.01-31
35	-2.59-32	-3.58-32	-4.80-32	-6.23-32	-7.90-32	-9.87-32	-1.22-31	-1.51-31	-1.85-31	-2.32-31	-2.96-31	-3.89-31	-5.31-31	-7.62-31
30	-5.94-32	-8.80-32	-1.27-31	-1.81-31	-2.55-31	-3.59-31	-5.15-31	-7.61-31	-1.16-30	-1.93-30	-3.59-30	-8.00-30	-2.49-29	-1.72-28
29	-7.26-32	-1.10-31	-1.62-31	-2.37-31	-3.45-31	-5.07-31	-7.64-31	-1.20-30	-2.01-30	-3.78-30	-8.52-30	-2.61-29	-1.87-28	
28	-9.00-32	-1.39-31	-2.12-31	-3.20-31	-4.84-31	-7.48-31	-1.20-30	-2.07-30	-3.91-30	-8.90-30	-2.82-29	-1.99-28		
27	-1.14-31	-1.80-31	-2.84-31	-4.46-31	-7.10-31	-1.17-30	-2.05-30	-3.99-30	-9.15-30	-2.93-29	-2.09-28			
26	-1.46-31	-2.40-31	-3.93-31	-6.49-31	-1.10-30	-1.98-30	-3.92-30	-9.24-30	-2.99-29	-2.14-28				
25	-1.92-31	-3.29-31	-5.66-31	-9.98-31	-1.85-30	-3.76-30	-9.00-30	-2.97-29	-2.17-28					
24	-2.60-31	-4.69-31	-8.61-31	-1.65-30	-3.47-30	-8.51-30	-2.86-29	-2.08-28						
23	-3.63-31	-6.97-31	-1.40-30	-3.03-30	-7.69-30	-2.65-29	-2.00-28							
22	-5.33-31	-1.12-30	-2.54-30	-6.68-30	-2.38-29	-1.84-28								
21	-8.32-31	-1.98-30	-5.45-30	-2.02-29	-1.62-28									
20	-1.43-30	-4.12-30	-1.60-29	-1.33-28										
19	-2.87-30	-1.17-29	-1.02-28											
18	-7.75-30	-7.11-29												
17	-4.48-29													

H TE = 3.00+03 NE = 1.00+08 CASE B NC = 20

TOTAL RC = 8.194-13 4-2 RC = 1.013-13 4-2 EM = 4.138-25 2S RC = 2.491-13 2P RC = 5.703-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.87-03	5.73-04	2.46-04	1.27-04	7.44-05	4.71-05	3.17-05	2.23-05	1.63-05	1.23-05	9.49-06	7.47-06	5.99-06	4.88-06
45	2.57-03	7.89-04	3.39-04	1.76-04	1.02-04	6.49-05	4.37-05	3.08-05	2.25-05	1.69-05	1.31-05	1.03-05	8.25-06	6.71-06
40	3.68-03	1.13-03	4.86-04	2.51-04	1.47-04	9.29-05	6.25-05	4.40-05	3.22-05	2.42-05	1.87-05	1.47-05	1.18-05	9.60-06
35	5.54-03	1.70-03	7.31-04	3.78-04	2.21-04	1.40-04	9.40-05	6.62-05	4.84-05	3.64-05	2.81-05	2.21-05	1.77-05	1.44-05
30	8.89-03	2.73-03	1.17-03	6.07-04	3.54-04	2.24-04	1.51-04	1.06-04	7.75-05	5.83-05	4.49-05	3.54-05	2.83-05	2.30-05
29	9.86-03	3.03-03	1.30-03	6.73-04	3.92-04	2.48-04	1.67-04	1.18-04	8.59-05	6.46-05	4.98-05	3.92-05	3.14-05	2.55-05
28	1.19-02	3.37-03	1.45-03	7.49-04	4.37-04	2.76-04	1.86-04	1.31-04	9.56-05	7.19-05	5.54-05	4.36-05	3.49-05	2.83-05
27	1.23-02	3.76-03	1.62-03	8.37-04	4.88-04	3.09-04	2.08-04	1.46-04	1.07-04	8.02-05	6.18-05	4.86-05	3.89-05	3.16-05
26	1.38-02	4.22-03	1.81-03	9.38-04	5.47-04	3.46-04	2.33-04	1.64-04	1.20-04	8.99-05	6.93-05	5.45-05	4.36-05	3.54-05
25	1.55-02	4.75-03	2.04-03	1.06-03	6.16-04	3.90-04	2.62-04	1.84-04	1.35-04	1.01-04	7.79-05	6.12-05	4.90-05	3.97-05
24	1.75-02	5.37-03	2.31-03	1.19-03	6.96-04	4.40-04	2.96-04	2.08-04	1.52-04	1.14-04	8.79-05	6.91-05	5.52-05	4.48-05
23	1.99-02	6.10-03	2.62-03	1.35-03	7.89-04	4.99-04	3.35-04	2.36-04	1.72-04	1.29-04	9.96-05	7.82-05	6.25-05	5.06-05
22	2.27-02	6.94-03	2.98-03	1.54-03	8.99-04	5.68-04	3.82-04	2.69-04	1.96-04	1.47-04	1.13-04	8.88-05	7.09-05	5.74-05
21	2.59-02	7.93-03	3.41-03	1.76-03	1.03-03	6.49-04	4.36-04	3.06-04	2.23-04	1.68-04	1.29-04	1.01-04	8.07-05	6.52-05
20	2.96-02	9.07-03	3.89-03	2.01-03	1.17-03	7.41-04	4.98-04	3.50-04	2.55-04	1.91-04	1.47-04	1.15-04	9.17-05	7.40-05
19	3.39-02	1.04-02	4.46-03	2.31-03	1.34-03	8.49-04	5.70-04	4.00-04	2.92-04	2.19-04	1.68-04	1.31-04	1.04-04	8.38-05
18	3.88-02	1.19-02	5.10-03	2.64-03	1.54-03	9.70-04	6.51-04	4.57-04	3.33-04	2.49-04	1.91-04	1.49-04	1.18-04	9.41-05
17	4.42-02	1.35-02	5.81-03	3.00-03	1.75-03	1.10-03	7.40-04	5.19-04	3.78-04	2.83-04	2.16-04	1.68-04	1.32-04	1.03-04
16	4.99-02	1.53-02	6.56-03	3.39-03	1.97-03	1.24-03	8.34-04	5.85-04	4.25-04	3.17-04	2.41-04	1.86-04	1.44-04	1.06-04
15	5.57-02	1.71-02	7.32-03	3.78-03	2.20-03	1.39-03	9.29-04	6.51-04	4.71-04	3.50-04	2.65-04	2.01-04	1.46-04	
14	6.14-02	1.88-02	8.07-03	4.17-03	2.42-03	1.53-03	1.02-03	7.14-04	5.16-04	3.81-04	2.83-04	2.02-04		
13	6.74-02	2.07-02	8.86-03	4.58-03	2.66-03	1.68-03	1.12-03	7.79-04	5.59-04	4.06-04	2.84-04			
12	7.50-02	2.30-02	9.87-03	5.10-03	2.96-03	1.86-03	1.24-03	8.57-04	6.05-04	4.14-04				
11	8.59-02	2.64-02	1.13-02	5.85-03	3.39-03	2.13-03	1.41-03	9.60-04	6.39-04					
10	1.02-01	3.14-02	1.35-02	6.99-03	4.05-03	2.53-03	1.65-03	1.06-03						
9	1.26-01	3.89-02	1.68-02	8.72-03	5.05-03	3.12-03	1.93-03							
8	1.61-01	5.03-02	2.19-02	1.14-02	6.57-03	3.87-03								
7	2.15-01	6.83-02	3.03-02	1.59-02	8.79-03									
6	3.09-01	1.00-01	4.56-02	2.33-02										
5	5.01-01	1.67-01	7.54-02											
4	1.00+00	3.26-01												
3	2.77+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.02-06	3.36-06	2.83-06	2.41-06	2.06-06	1.78-06	1.55-06	1.36-06	1.19-06	1.06-06	9.39-07	8.38-07	7.51-07	6.76-07
45	5.54-06	4.62-06	3.89-06	3.31-06	2.84-06	2.45-06	2.13-06	1.87-06	1.64-06	1.45-06	1.29-06	1.15-06	1.03-06	9.27-07
40	7.91-06	6.60-06	5.56-06	4.73-06	4.05-06	3.50-06	3.04-06	2.66-06	2.34-06	2.07-06	1.84-06	1.64-06	1.46-06	1.32-06
35	1.19-05	9.90-06	8.34-06	7.08-06	6.07-06	5.24-06	4.55-06	3.97-06	3.49-06	3.08-06	2.73-06	2.43-06	2.16-06	1.93-06
30	1.89-05	1.58-05	1.33-05	1.13-05	9.64-06	8.30-06	7.19-06	6.26-06	5.47-06	4.80-06	4.21-06	3.68-06	3.18-06	2.59-06
29	2.10-05	1.75-05	1.47-05	1.25-05	1.07-05	9.17-06	7.94-06	6.90-06	6.02-06	5.26-06	4.58-06	3.94-06	3.20-06	
28	2.33-05	1.94-05	1.63-05	1.38-05	1.18-05	1.02-05	8.78-06	7.61-06	6.61-06	5.73-06	4.91-06	3.97-06		
27	2.60-05	2.16-05	1.82-05	1.54-05	1.31-05	1.13-05	9.72-06	8.40-06	7.24-06	6.17-06	4.97-06			
26	2.91-05	2.42-05	2.03-05	1.72-05	1.46-05	1.25-05	1.08-05	9.23-06	7.82-06	6.27-06				
25	3.27-05	2.71-05	2.28-05	1.92-05	1.63-05	1.39-05	1.19-05	1.00-05	7.98-06					
24	3.68-05	3.05-05	2.56-05	2.15-05	1.82-05	1.54-05	1.29-05	1.02-05						
23	4.15-05	3.44-05	2.87-05	2.41-05	2.03-05	1.69-05	1.33-05							
22	4.70-05	3.89-05	3.23-05	2.69-05	2.22-05	1.74-05								
21	5.33-05	4.39-05	3.62-05	2.97-05	2.30-05									
20	6.02-05	4.92-05	3.99-05	3.08-05										
19	6.77-05	5.44-05	4.15-05											
18	7.47-05	5.65-05												
17	7.73-05													

H TE = 3.00+03 NE = 1.00+08 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.51-30	-5.31-37	-4.73-36	-1.58-35	-3.98-35	-8.56-35	-1.65-34	-2.91-34	-4.77-34	-7.27-34	-1.02-33	-1.31-33	-1.50-33	-1.55-33
45	1.17-29	-7.43-37	-6.58-36	-2.20-35	-5.58-35	-1.20-34	-2.33-34	-4.15-34	-6.86-34	-1.05-33	-1.50-33	-1.94-33	-2.27-33	-2.40-33
40	1.67-29	-1.08-36	-9.54-36	-3.21-35	-8.16-35	-1.78-34	-3.47-34	-6.24-34	-1.04-33	-1.63-33	-2.35-33	-3.10-33	-3.71-33	-4.02-33
35	2.50-29	-1.68-36	-1.46-35	-4.94-35	-1.27-34	-2.79-34	-5.52-34	-1.01-33	-1.71-33	-2.72-33	-4.03-33	-5.46-33	-6.77-33	-7.66-33
30	3.98-29	-2.78-36	-2.40-35	-8.20-35	-2.13-34	-4.77-34	-9.64-34	-1.80-33	-3.15-33	-5.18-33	-7.94-33	-1.13-32	-1.48-32	-1.79-32
29	4.42-29	-3.11-36	-2.68-35	-9.18-35	-2.40-34	-5.39-34	-1.09-33	-2.06-33	-3.62-33	-6.01-33	-9.32-33	-1.34-32	-1.78-32	-2.19-32
28	4.91-29	-3.49-36	-3.01-35	-1.03-34	-2.71-34	-6.11-34	-1.25-33	-2.36-33	-4.20-33	-7.03-33	-1.10-32	-1.61-32	-2.17-32	-2.74-32
27	5.49-29	-3.93-36	-3.38-35	-1.17-34	-3.07-34	-6.97-34	-1.43-33	-2.74-33	-4.91-33	-8.31-33	-1.32-32	-1.96-32	-2.70-32	-3.48-32
26	6.15-29	-4.45-36	-3.83-35	-1.32-34	-3.50-34	-8.00-34	-1.66-33	-3.19-33	-5.79-33	-9.94-33	-1.60-32	-2.42-32	-3.41-32	-4.51-32
25	6.94-29	-5.05-36	-4.35-35	-1.51-34	-4.02-34	-9.24-34	-1.93-33	-3.76-33	-6.91-33	-1.20-32	-1.98-32	-3.04-32	-4.40-32	-6.01-32
24	7.86-29	-5.74-36	-4.96-35	-1.73-34	-4.63-34	-1.08-33	-2.27-33	-4.47-33	-8.33-33	-1.47-32	-2.47-32	-3.91-32	-5.81-32	-8.25-32
23	8.95-29	-6.55-36	-5.68-35	-1.99-34	-5.38-34	-1.26-33	-2.69-33	-5.37-33	-1.02-32	-1.84-32	-3.15-32	-5.13-32	-7.91-32	-1.17-31
22	1.05-28	-7.47-36	-6.54-35	-2.31-34	-6.28-34	-1.49-33	-3.22-33	-6.52-33	-1.26-32	-2.33-32	-4.11-32	-6.93-32	-1.12-31	-1.75-31
21	1.18-28	-8.51-36	-7.54-35	-2.68-34	-7.38-34	-1.77-33	-3.88-33	-8.02-33	-1.58-32	-3.01-32	-5.51-32	-9.68-32	-1.65-31	-2.77-31
20	1.37-28	-9.57-36	-8.69-35	-3.12-34	-8.69-34	-2.11-33	-4.72-33	-9.97-33	-2.02-32	-3.97-32	-7.58-32	-1.41-31	-2.56-31	-4.72-31
19	1.61-28	-1.07-35	-1.00-34	-3.65-34	-1.03-33	-2.54-33	-5.80-33	-1.26-32	-2.64-32	-5.40-32	-1.09-31	-2.16-31	-4.31-31	-9.03-31
18	1.90-28	-1.16-35	-1.15-34	-4.26-34	-1.22-33	-3.07-33	-7.19-33	-1.61-32	-3.51-32	-7.59-32	-1.63-31	-3.55-31	-8.07-31	-2.06-30
17	2.27-28	-1.21-35	-1.31-34	-4.94-34	-1.44-33	-3.71-33	-8.96-33	-2.09-32	-4.79-32	-1.11-31	-2.61-31	-6.47-31	-1.79-30	-6.50-30
16	2.74-28	-1.16-35	-1.47-34	-5.65-34	-1.68-33	-4.47-33	-1.12-32	-2.74-32	-6.73-32	-1.70-31	-4.57-31	-1.38-30	-5.43-30	-4.45-29
15	3.35-28	-9.18-36	-1.59-34	-6.33-34	-1.94-33	-5.33-33	-1.40-32	-3.64-32	-9.78-32	-2.81-31	-9.23-31	-3.97-30	-3.53-29	
14	4.17-28	-3.92-36	-1.66-34	-6.90-34	-2.19-33	-6.27-33	-1.75-32	-4.96-32	-1.51-31	-5.28-31	-2.46-30	-2.40-29		
13	5.27-28	5.21-36	-1.65-34	-7.35-34	-2.43-33	-7.35-33	-2.21-32	-7.08-32	-2.61-31	-1.29-30	-1.36-29			
12	6.81-28	1.91-35	-1.60-34	-7.77-34	-2.71-33	-8.82-33	-2.97-32	-1.14-31	-5.89-31	-6.55-30				
11	9.03-28	3.95-35	-1.51-34	-8.41-34	-3.16-33	-1.14-32	-4.57-32	-2.04-31	-2.80-30					
10	1.23-27	7.08-35	-1.37-34	-9.46-34	-3.96-33	-1.68-32	-9.29-32	-1.09-30						
9	1.76-27	1.29-34	-1.03-34	-1.10-33	-5.46-33	-3.13-32	-3.79-31							
8	2.68-27	2.22-34	-4.26-36	-1.23-33	-8.31-33	-9.56-32								
7	4.26-27	4.31-34	3.30-34	-7.06-34	-7.60-33									
6	7.65-27	9.55-35	1.72-33	1.08-32										
5	1.64-26	2.65-33	1.27-32											
4	4.90-26	1.35-32												
3	3.55-25													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.43-33	-1.32-33	-6.38-34	-2.16-35	8.65-34	1.97-33	3.26-33	4.85-33	6.78-33	9.14-33	1.20-32	1.56-32	2.00-32	2.56-32
45	-2.26-33	-1.86-33	-1.19-33	-2.22-34	1.06-33	2.79-33	4.90-33	7.57-33	1.10-32	1.53-32	2.08-32	2.80-32	3.73-32	4.96-32
40	-3.95-33	-3.45-33	-2.49-33	-1.02-33	1.05-33	4.08-33	7.87-33	1.30-32	2.00-32	2.98-32	4.25-32	6.08-32	8.70-32	1.25-31
35	-7.96-33	-7.54-33	-6.29-33	-4.01-33	-4.01-34	5.92-33	1.37-32	2.60-32	4.47-32	7.36-32	1.20-31	1.97-31	3.31-31	5.83-31
30	-2.05-32	-2.15-32	-2.18-32	-1.91-32	-1.35-32	-9.46-34	2.16-32	6.57-32	1.55-31	3.51-31	8.39-31	2.31-30	8.65-30	7.08-29
29	-2.56-32	-2.79-32	-2.89-32	-2.76-32	-2.24-32	-8.20-33	2.00-32	8.15-32	2.23-31	5.84-31	1.71-30	6.64-30	5.58-29	
28	-3.29-32	-3.69-32	-4.00-32	-4.09-32	-3.76-32	-2.29-32	1.16-32	1.00-31	3.43-31	1.13-30	4.74-30	4.17-29		
27	-4.26-32	-5.01-32	-5.72-32	-6.28-32	-6.50-32	-5.38-32	-1.61-32	1.13-31	5.87-31	2.91-30	2.83-29			
26	-5.72-32	-7.03-32	-8.49-32	-1.01-31	-1.18-31	-1.24-31	-1.08-31	6.80-32	1.19-30	1.53-29				
25	-7.92-32	-1.02-31	-1.32-31	-1.72-31	-2.30-31	-3.05-31	-4.18-31	-4.34-31	3.38-30					
24	-1.14-31	-1.56-31	-2.19-31	-3.18-31	-5.00-31	-8.69-31	-1.97-30	-8.21-30						
23	-1.72-31	-2.54-31	-3.93-31	-6.61-31	-1.30-30	-3.37-30	-1.89-29							
22	-2.75-31	-4.48-31	-7.94-31	-1.65-30	-4.67-30	-2.85-29								
21	-4.77-31	-8.89-31	-1.93-30	-5.73-30	-3.67-29									
20	-9.26-31	-2.10-30	-6.49-30	-4.36-29										
19	-2.16-30	-6.98-30	-4.88-29											
18	-7.01-30	-5.11-29												
17	-4.99-29													

H TE = 3.00+03 NE = 1.00+09 CASE B NC = 20

TOTAL RC = 9.606-13 4-2 RC = 1.234-13 4-2 EM = 5.044-25 2S RC = 2.846-13 2P RC = 6.760-13

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.53-03	4.70-04	2.02-04	1.05-04	6.10-05	3.87-05	2.60-05	1.83-05	1.34-05	1.01-05	7.79-06	6.13-06	4.92-06	4.00-06
45	2.11-03	6.48-04	2.78-04	1.44-04	8.41-05	5.33-05	3.58-05	2.53-05	1.85-05	1.39-05	1.07-05	8.45-06	6.77-06	5.51-06
40	3.03-03	9.28-04	3.99-04	2.07-04	1.20-04	7.63-05	5.13-05	3.62-05	2.64-05	1.99-05	1.54-05	1.21-05	9.69-06	7.89-06
35	4.56-03	1.40-03	6.01-04	3.11-04	1.82-04	1.15-04	7.73-05	5.45-05	3.98-05	3.00-05	2.31-05	1.82-05	1.46-05	1.19-05
30	7.35-03	2.25-03	9.68-04	5.01-04	2.92-04	1.85-04	1.24-04	8.76-05	6.40-05	4.81-05	3.71-05	2.92-05	2.34-05	1.90-05
29	8.16-03	2.50-03	1.08-03	5.57-04	3.25-04	2.05-04	1.38-04	9.73-05	7.11-05	5.35-05	4.12-05	3.24-05	2.60-05	2.11-05
28	9.11-03	2.79-03	1.20-03	6.21-04	3.62-04	2.29-04	1.54-04	1.08-04	7.92-05	5.96-05	4.59-05	3.61-05	2.89-05	2.35-05
27	1.02-02	3.13-03	1.34-03	6.96-04	4.05-04	2.57-04	1.73-04	1.21-04	8.87-05	6.67-05	5.14-05	4.04-05	3.24-05	2.63-05
26	1.15-02	3.52-03	1.51-03	7.83-04	4.56-04	2.89-04	1.94-04	1.37-04	9.97-05	7.50-05	5.78-05	4.54-05	3.63-05	2.95-05
25	1.30-02	3.98-03	1.71-03	8.85-04	5.16-04	3.26-04	2.19-04	1.54-04	1.13-04	8.47-05	6.52-05	5.13-05	4.10-05	3.33-05
24	1.48-02	4.52-03	1.94-03	1.01-03	5.86-04	3.71-04	2.49-04	1.75-04	1.28-04	9.62-05	7.41-05	5.82-05	4.65-05	3.77-05
23	1.69-02	5.17-03	2.22-03	1.15-03	6.70-04	4.24-04	2.85-04	2.00-04	1.46-04	1.10-04	8.45-05	6.64-05	5.30-05	4.30-05
22	1.94-02	5.95-03	2.55-03	1.32-03	7.70-04	4.87-04	3.27-04	2.30-04	1.68-04	1.26-04	9.70-05	7.61-05	6.08-05	4.92-05
21	2.25-02	6.89-03	2.96-03	1.53-03	8.91-04	5.64-04	3.78-04	2.66-04	1.94-04	1.46-04	1.12-04	8.79-05	7.01-05	5.66-05
20	2.62-02	8.03-03	3.45-03	1.78-03	1.04-03	6.56-04	4.41-04	3.10-04	2.26-04	1.69-04	1.30-04	1.02-04	8.12-05	6.55-05
19	3.08-02	9.44-03	4.05-03	2.09-03	1.22-03	7.70-04	5.17-04	3.63-04	2.65-04	1.98-04	1.52-04	1.19-04	9.46-05	7.60-05
18	3.65-02	1.12-02	4.79-03	2.48-03	1.44-03	9.11-04	6.11-04	4.29-04	3.12-04	2.34-04	1.79-04	1.40-04	1.11-04	8.82-05
17	4.35-02	1.33-02	5.72-03	2.95-03	1.72-03	1.09-03	7.28-04	5.10-04	3.71-04	2.77-04	2.12-04	1.65-04	1.29-04	1.01-04
16	5.23-02	1.60-02	6.86-03	3.55-03	2.06-03	1.30-03	8.72-04	6.11-04	4.43-04	3.31-04	2.52-04	1.94-04	1.50-04	1.11-04
15	6.31-02	1.93-02	8.28-03	4.28-03	2.48-03	1.57-03	1.05-03	7.34-04	5.31-04	3.95-04	2.98-04	2.26-04	1.64-04	
14	7.62-02	2.33-02	1.00-02	5.16-03	3.00-03	1.89-03	1.26-03	8.80-04	6.35-04	4.68-04	3.48-04	2.48-04		
13	9.15-02	2.80-02	1.20-02	6.18-03	3.59-03	2.26-03	1.50-03	1.05-03	7.49-04	5.43-04	3.79-04			
12	1.08-01	3.30-02	1.41-02	7.28-03	4.22-03	2.65-03	1.76-03	1.21-03	8.54-04	5.83-04				
11	1.24-01	3.79-02	1.62-02	8.33-03	4.82-03	3.01-03	1.98-03	1.35-03	8.93-04					
10	1.39-01	4.23-02	1.81-02	9.29-03	5.35-03	3.32-03	2.15-03	1.38-03						
9	1.57-01	4.79-02	2.04-02	1.05-02	5.98-03	3.66-03	2.23-03							
8	1.87-01	5.72-02	2.43-02	1.24-02	6.99-03	4.03-03								
7	2.42-01	7.37-02	3.13-02	1.57-02	8.41-03									
6	3.38-01	1.03-01	4.37-02	2.10-02										
5	5.29-01	1.61-01	6.59-02											
4	1.00+00	2.90-01												
3	2.60+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.30-06	2.75-06	2.32-06	1.97-06	1.69-06	1.46-06	1.27-06	1.11-06	9.80-07	8.67-07	7.71-07	6.88-07	6.17-07	5.55-07
45	4.54-06	3.79-06	3.19-06	2.72-06	2.33-06	2.01-06	1.75-06	1.53-06	1.35-06	1.19-06	1.06-06	9.45-07	8.46-07	7.61-07
40	6.50-06	5.42-06	4.57-06	3.88-06	3.33-06	2.87-06	2.50-06	2.19-06	1.92-06	1.70-06	1.51-06	1.34-06	1.20-06	1.08-06
35	9.77-06	8.14-06	6.86-06	5.83-06	4.99-06	4.31-06	3.74-06	3.27-06	2.87-06	2.53-06	2.24-06	2.00-06	1.78-06	1.59-06
30	1.57-05	1.30-05	1.10-05	9.31-06	7.96-06	6.86-06	5.94-06	5.17-06	4.52-06	3.97-06	3.48-06	3.04-06	2.63-06	2.14-06
29	1.74-05	1.45-05	1.22-05	1.03-05	8.82-06	7.59-06	6.57-06	5.71-06	4.98-06	4.35-06	3.79-06	3.26-06	2.65-06	
28	1.93-05	1.61-05	1.35-05	1.15-05	9.80-06	8.42-06	7.28-06	6.31-06	5.48-06	4.75-06	4.07-06	3.29-06		
27	2.16-05	1.80-05	1.51-05	1.28-05	1.09-05	9.37-06	8.08-06	6.98-06	6.02-06	5.13-06	4.13-06			
26	2.43-05	2.02-05	1.69-05	1.43-05	1.22-05	1.05-05	8.98-06	7.70-06	6.52-06	5.23-06				
25	2.74-05	2.27-05	1.91-05	1.61-05	1.37-05	1.17-05	9.94-06	8.38-06	6.68-06					
24	3.10-05	2.57-05	2.15-05	1.81-05	1.54-05	1.30-05	1.09-05	8.63-06						
23	3.53-05	2.92-05	2.44-05	2.05-05	1.72-05	1.43-05	1.13-05							
22	4.03-05	3.33-05	2.77-05	2.31-05	1.91-05	1.49-05								
21	4.63-05	3.81-05	3.14-05	2.58-05	2.00-05									
20	5.33-05	4.35-05	3.53-05	2.72-05										
19	6.14-05	4.93-05	3.76-05											
18	7.00-05	5.29-05												
17	7.57-05													

H TE = 3.00+03 NE = 1.00+09 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.95-30	-5.60-37	-4.63-36	-1.48-35	-3.60-35	-7.39-35	-1.31-34	-1.96-34	-2.33-34	-1.90-34	-3.94-35	2.12-34	5.53-34	9.77-34
45	1.37-29	-7.83-37	-6.43-36	-2.06-35	-5.05-35	-1.04-34	-1.86-34	-2.81-34	-3.38-34	-2.83-34	-7.40-35	2.85-34	7.81-34	1.41-33
40	1.95-29	-1.14-36	-9.34-36	-3.01-35	-7.41-35	-1.54-34	-2.77-34	-4.25-34	-5.22-34	-4.53-34	-1.50-34	3.89-34	1.15-33	2.15-33
35	2.92-29	-1.77-36	-1.43-35	-4.65-35	-1.15-34	-2.43-34	-4.44-34	-6.94-34	-8.75-34	-7.99-34	-3.42-34	5.27-34	1.82-33	3.57-33
30	4.66-29	-2.97-36	-2.37-35	-7.78-35	-1.96-34	-4.20-34	-7.85-34	-1.26-33	-1.66-33	-1.64-33	-9.18-34	6.16-34	3.07-33	6.67-33
29	5.16-29	-3.34-36	-2.66-35	-8.73-35	-2.21-34	-4.76-34	-8.95-34	-1.45-33	-1.93-33	-1.94-33	-1.15-33	5.92-34	3.44-33	7.71-33
28	5.74-29	-3.76-36	-2.99-35	-9.85-35	-2.50-34	-5.42-34	-1.03-33	-1.68-33	-2.26-33	-2.31-33	-1.46-33	5.29-34	3.87-33	8.99-33
27	6.42-29	-4.27-36	-3.38-35	-1.12-34	-2.85-34	-6.21-34	-1.19-33	-1.96-33	-2.67-33	-2.80-33	-1.87-33	4.04-34	4.35-33	1.06-32
26	7.20-29	-4.87-36	-3.84-35	-1.27-34	-3.27-34	-7.17-34	-1.38-33	-2.31-33	-3.19-33	-3.43-33	-2.44-33	1.76-34	4.89-33	1.26-32
25	8.11-29	-5.59-36	-4.39-35	-1.46-34	-3.78-34	-8.35-34	-1.62-33	-2.74-33	-3.87-33	-4.27-33	-3.24-33	-2.21-34	5.47-33	1.52-32
24	9.19-29	-6.45-36	-5.05-35	-1.69-34	-4.40-34	-9.81-34	-1.93-33	-3.31-33	-4.75-33	-5.41-33	-4.38-33	-9.06-34	6.04-33	1.85-32
23	1.05-28	-7.51-36	-5.86-35	-1.97-34	-5.17-34	-1.16-33	-2.32-33	-4.04-33	-5.93-33	-6.99-33	-6.06-33	-2.09-33	6.49-33	2.29-32
22	1.20-28	-8.80-36	-6.84-35	-2.32-34	-6.13-34	-1.40-33	-2.82-33	-5.01-33	-7.55-33	-9.24-33	-8.61-33	-4.17-33	6.52-33	2.87-32
21	1.38-28	-1.04-35	-8.06-35	-2.75-34	-7.36-34	-1.70-33	-3.49-33	-6.33-33	-9.82-33	-1.25-32	-1.26-32	-7.93-33	5.41-33	3.65-32
20	1.61-28	-1.24-35	-9.58-35	-3.30-34	-8.93-34	-2.09-33	-4.39-33	-8.17-33	-1.31-32	-1.76-32	-1.92-32	-1.50-32	1.42-33	4.68-32
19	1.88-28	-1.49-35	-1.15-34	-4.00-34	-1.10-33	-2.63-33	-5.63-33	-1.08-32	-1.81-32	-2.57-32	-3.08-32	-2.93-32	-1.90-32	5.68-32
18	2.22-28	-1.81-35	-1.40-34	-4.92-34	-1.37-33	-3.35-33	-7.39-33	-1.47-32	-2.59-32	-3.94-32	-5.25-32	-6.06-32	-4.93-32	4.92-32
17	2.69-28	-2.21-35	-1.71-34	-6.13-34	-1.75-33	-4.37-33	-9.98-33	-2.08-32	-3.88-32	-6.43-32	-9.72-32	-1.39-31	-1.84-31	-1.28-31
16	3.21-28	-2.71-35	-2.12-34	-7.73-34	-2.26-33	-5.84-33	-1.39-32	-3.06-32	-6.17-32	-1.14-31	-2.03-31	-3.78-31	-8.43-31	-3.14-30
15	3.92-28	-3.32-35	-2.65-34	-9.87-34	-2.97-33	-8.00-33	-2.01-32	-4.76-32	-1.06-31	-2.26-31	-5.06-31	-1.41-30	-7.94-30	
14	4.87-28	-4.01-35	-3.32-34	-1.27-33	-3.97-33	-1.13-32	-3.03-32	-7.91-32	-2.03-31	-5.37-31	-1.45-30	-1.15-29		
13	6.16-28	-4.67-35	-4.13-34	-1.64-33	-5.38-33	-1.63-32	-4.82-32	-1.44-31	-4.55-31	-1.74-30	-1.31-29			
12	7.96-28	-5.01-35	-5.00-34	-2.09-33	-7.29-33	-2.42-32	-8.16-32	-3.00-31	-1.37-30	-1.21-29				
11	1.06-27	-4.42-35	-5.78-34	-2.58-33	-9.80-33	-3.69-32	-1.52-31	-8.05-31	-8.45-30					
10	1.44-27	-2.16-35	-6.25-34	-3.08-33	-1.32-32	-6.00-32	-3.52-31	-4.26-30						
9	2.06-27	2.42-35	-6.49-34	-3.70-33	-1.90-32	-1.21-31	-1.60-30							
8	3.09-27	1.06-34	-6.86-34	-4.97-33	-3.54-32	-4.99-31								
7	4.98-27	2.70-34	-7.51-34	-8.55-33	-1.34-31									
6	8.95-27	6.86-34	-7.04-34	-2.57-32										
5	1.91-26	2.15-33	1.97-33											
4	5.73-26	1.20-32												
3	4.15-25													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.49-33	2.10-33	2.83-33	3.69-33	4.73-33	5.98-33	7.48-33	9.28-33	1.15-32	1.41-32	1.74-32	2.14-32	2.63-32	3.24-32
45	2.18-33	3.13-33	4.27-33	5.67-33	7.38-33	9.51-33	1.21-32	1.54-32	1.95-32	2.46-32	3.11-32	3.95-32	5.03-32	6.46-32
40	3.42-33	5.00-33	7.00-33	9.52-33	1.27-32	1.69-32	2.22-32	2.91-32	3.81-32	5.06-32	6.73-32	9.08-32	1.23-31	1.70-31
35	5.89-33	8.94-33	1.30-32	1.84-32	2.57-32	3.58-32	4.98-32	6.98-32	9.90-32	1.41-31	2.11-31	3.21-31	5.09-31	8.55-31
30	1.18-32	1.92-32	2.99-32	4.57-32	6.99-32	1.08-31	1.71-31	2.79-31	4.81-31	8.91-31	1.85-30	4.59-30	1.59-29	1.22-28
29	1.40-32	2.31-32	3.68-32	5.78-32	9.09-32	1.46-31	2.41-31	4.19-31	7.82-31	1.63-30	4.07-30	1.41-29	1.09-28	
28	1.67-32	2.83-32	4.63-32	7.48-32	1.27-31	2.05-31	3.60-31	6.78-31	1.43-30	3.58-30	1.25-29	9.67-29		
27	2.02-32	3.53-32	5.96-32	1.00-31	1.71-31	3.05-31	5.82-31	1.23-30	3.12-30	1.10-29	8.53-29			
26	2.50-32	4.51-32	7.92-32	1.39-31	2.53-31	4.91-31	1.05-30	2.69-30	9.51-30	7.44-29				
25	3.14-32	5.94-32	1.09-31	2.05-31	4.05-31	8.83-31	2.28-30	8.15-30	6.44-29					
24	4.06-32	8.09-32	1.59-31	3.25-31	7.22-31	1.90-30	6.87-30	5.46-29						
23	5.40-32	1.16-31	2.49-31	5.73-31	1.54-30	5.67-30	4.58-29							
22	7.49-32	1.77-31	4.32-31	1.21-30	4.55-30	3.73-29								
21	1.10-31	2.99-31	8.89-31	3.50-30	2.97-29									
20	1.74-31	5.92-31	2.51-30	2.22-29										
19	3.10-31	1.56-30	1.52-29											
18	6.82-31	8.58-30												
17	2.45-30													

H TE = 3.00+03 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 1.256-12 4-2 RC = 1.670-13 4-2 EM = 6.824-29 2S RC = 3.091-13 2P RC = 9.467-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.13-03	3.47-04	1.49-04	7.73-05	4.51-05	2.86-05	1.92-05	1.36-05	9.91-06	7.46-06	5.76-06	4.53-06	3.64-06	2.96-06
45	1.56-03	4.79-04	2.06-04	1.07-04	6.22-05	3.94-05	2.65-05	1.87-05	1.36-05	1.03-05	7.93-06	6.25-06	5.01-06	4.07-06
40	2.24-03	6.86-04	2.95-04	1.53-04	8.91-05	5.64-05	3.80-05	2.67-05	1.95-05	1.47-05	1.14-05	8.94-06	7.17-06	5.83-06
35	3.37-03	1.03-03	4.44-04	2.30-04	1.34-04	8.50-05	5.72-05	4.03-05	2.94-05	2.22-05	1.71-05	1.35-05	1.08-05	8.77-06
30	5.44-03	1.67-03	7.16-04	3.71-04	2.16-04	1.37-04	9.20-05	6.48-05	4.74-05	3.56-05	2.75-05	2.16-05	1.73-05	1.41-05
29	6.04-03	1.85-03	7.96-04	4.12-04	2.40-04	1.52-04	1.02-04	7.20-05	5.26-05	3.96-05	3.05-05	2.40-05	1.92-05	1.56-05
28	6.74-03	2.07-03	8.88-04	4.60-04	2.68-04	1.70-04	1.14-04	8.03-05	5.87-05	4.41-05	3.40-05	2.68-05	2.14-05	1.74-05
27	7.56-03	2.32-03	9.95-04	5.15-04	3.00-04	1.90-04	1.28-04	9.00-05	6.57-05	4.94-05	3.81-05	2.99-05	2.40-05	1.95-05
26	8.51-03	2.61-03	1.12-03	5.80-04	3.38-04	2.14-04	1.44-04	1.01-04	7.39-05	5.56-05	4.28-05	3.37-05	2.69-05	2.19-05
25	9.63-03	2.95-03	1.27-03	6.56-04	3.83-04	2.42-04	1.63-04	1.15-04	8.36-05	6.28-05	4.84-05	3.80-05	3.04-05	2.47-05
24	1.10-02	3.36-03	1.44-03	7.47-04	4.35-04	2.75-04	1.85-04	1.30-04	9.50-05	7.14-05	5.50-05	4.32-05	3.45-05	2.80-05
23	1.25-02	3.85-03	1.65-03	8.55-04	4.98-04	3.15-04	2.12-04	1.49-04	1.09-04	8.16-05	6.28-05	4.94-05	3.94-05	3.20-05
22	1.45-02	4.43-03	1.90-03	9.85-04	5.74-04	3.63-04	2.44-04	1.71-04	1.25-04	9.39-05	7.23-05	5.67-05	4.53-05	3.67-05
21	1.68-02	5.15-03	2.21-03	1.14-03	6.66-04	4.21-04	2.83-04	1.99-04	1.45-04	1.09-04	8.37-05	6.56-05	5.23-05	4.23-05
20	1.97-02	6.02-03	2.59-03	1.34-03	7.79-04	4.92-04	3.31-04	2.32-04	1.69-04	1.27-04	9.76-05	7.65-05	6.09-05	4.91-05
19	2.32-02	7.12-03	3.05-03	1.58-03	9.19-04	5.81-04	3.90-04	2.74-04	2.00-04	1.50-04	1.15-04	8.98-05	7.13-05	5.73-05
18	2.77-02	8.49-03	3.64-03	1.88-03	1.10-03	6.92-04	4.64-04	3.26-04	2.37-04	1.78-04	1.36-04	1.06-04	8.41-05	6.70-05
17	3.35-02	1.02-02	4.40-03	2.27-03	1.32-03	8.34-04	5.59-04	3.92-04	2.85-04	2.13-04	1.63-04	1.27-04	9.95-05	7.79-05
16	4.09-02	1.25-02	5.37-03	2.77-03	1.61-03	1.02-03	6.82-04	4.78-04	3.47-04	2.59-04	1.97-04	1.52-04	1.19-04	8.64-05
15	5.07-02	1.55-02	6.65-03	3.43-03	2.00-03	1.26-03	8.42-04	5.89-04	4.27-04	3.17-04	2.39-04	1.82-04	1.32-04	
14	6.38-02	1.95-02	8.37-03	4.32-03	2.51-03	1.58-03	1.05-03	7.36-04	5.31-04	3.91-04	2.91-04	2.07-04		
13	8.17-02	2.50-02	1.07-02	5.51-03	3.20-03	2.01-03	1.34-03	9.31-04	6.66-04	4.83-04	3.37-04			
12	1.06-01	3.24-02	1.39-02	7.14-03	4.13-03	2.59-03	1.72-03	1.19-03	8.35-04	5.69-04				
11	1.39-01	4.24-02	1.81-02	9.32-03	5.38-03	3.36-03	2.22-03	1.50-03	9.94-04					
10	1.81-01	5.53-02	2.36-02	1.21-02	6.96-03	4.32-03	2.79-03	1.78-03						
9	2.29-01	6.97-02	2.97-02	1.52-02	8.65-03	5.27-03	3.21-03							
8	2.70-01	8.22-02	3.49-02	1.77-02	9.93-03	5.69-03								
7	3.10-01	9.39-02	3.95-02	1.97-02	1.04-02									
6	3.86-01	1.16-01	4.82-02	2.27-02										
5	5.61-01	1.66-01	6.53-02											
4	1.00+00	2.80-01												
3	2.51+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.44-06	2.04-06	1.72-06	1.46-06	1.25-06	1.08-06	9.41-07	8.23-07	7.25-07	6.41-07	5.70-07	5.09-07	4.56-07	4.10-07
45	3.36-06	2.80-06	2.36-06	2.01-06	1.72-06	1.49-06	1.29-06	1.13-06	9.96-07	8.81-07	7.82-07	6.98-07	6.25-07	5.62-07
40	4.81-06	4.01-06	3.38-06	2.87-06	2.46-06	2.13-06	1.85-06	1.62-06	1.42-06	1.26-06	1.11-06	9.94-07	8.89-07	7.99-07
35	7.22-06	6.02-06	5.07-06	4.31-06	3.69-06	3.19-06	2.77-06	2.42-06	2.12-06	1.87-06	1.66-06	1.48-06	1.32-06	1.18-06
30	1.16-05	9.65-06	8.12-06	6.89-06	5.89-06	5.07-06	4.40-06	3.83-06	3.35-06	2.93-06	2.58-06	2.25-06	1.94-06	1.59-06
29	1.29-05	1.07-05	9.00-06	7.64-06	6.53-06	5.62-06	4.86-06	4.23-06	3.69-06	3.22-06	2.80-06	2.41-06	1.96-06	
28	1.43-05	1.19-05	1.00-05	8.49-06	7.26-06	6.24-06	5.39-06	4.67-06	4.06-06	3.52-06	3.01-06	2.44-06		
27	1.60-05	1.33-05	1.12-05	9.48-06	8.09-06	6.94-06	5.99-06	5.17-06	4.46-06	3.80-06	3.06-06			
26	1.80-05	1.50-05	1.26-05	1.06-05	9.05-06	7.75-06	6.65-06	5.70-06	4.83-06	3.88-06				
25	2.03-05	1.69-05	1.41-05	1.19-05	1.02-05	8.66-06	7.38-06	6.22-06	4.96-06					
24	2.30-05	1.91-05	1.60-05	1.35-05	1.14-05	9.65-06	8.09-06	6.41-06						
23	2.62-05	2.17-05	1.81-05	1.52-05	1.28-05	1.06-05	8.39-06							
22	3.00-05	2.48-05	2.06-05	1.72-05	1.42-05	1.11-05								
21	3.46-05	2.85-05	2.35-05	1.92-05	1.49-05									
20	4.00-05	3.26-05	2.65-05	2.04-05										
19	4.63-05	3.72-05	2.84-05											
18	5.32-05	4.02-05												
17	5.82-05													

H TE = 3.00+03 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.27-29	-5.74-37	-3.86-36	-1.14-35	-2.37-35	-3.12-35	-1.53-36	9.67-35	2.58-34	4.66-34	7.15-34	1.01-33	1.36-33	1.78-33
45	1.74-29	-8.02-37	-5.38-36	-1.60-35	-3.34-35	-4.45-35	-4.02-36	1.33-34	3.61-34	6.59-34	1.02-33	1.46-33	1.98-33	2.62-33
40	2.49-29	-1.17-36	-7.83-36	-2.33-35	-4.93-35	-6.69-35	-9.80-36	1.91-34	5.30-34	9.81-34	1.54-33	2.23-33	3.07-33	4.12-33
35	3.72-29	-1.81-36	-1.21-35	-3.62-35	-7.76-35	-1.08-34	-2.43-35	2.87-34	8.28-34	1.56-33	2.50-33	3.69-33	5.21-33	7.15-33
30	5.94-29	-3.04-36	-2.01-35	-6.11-35	-1.34-34	-1.93-34	-6.56-35	4.58-34	1.41-33	2.76-33	4.56-33	6.95-33	1.02-32	1.45-32
29	6.58-29	-3.42-36	-2.25-35	-6.87-35	-1.51-34	-2.21-34	-8.13-35	5.07-34	1.59-33	3.14-33	5.23-33	8.06-33	1.19-32	1.73-32
28	7.32-29	-3.86-36	-2.54-35	-7.77-35	-1.72-34	-2.54-34	-1.02-34	5.63-34	1.80-33	3.60-33	6.06-33	9.43-33	1.41-32	2.07-32
27	8.18-29	-4.38-36	-2.87-35	-8.84-35	-1.97-34	-2.95-34	-1.28-34	6.26-34	2.05-33	4.15-33	7.08-33	1.12-32	1.69-32	2.53-32
26	9.17-29	-5.00-36	-3.27-35	-1.01-34	-2.27-34	-3.44-34	-1.62-34	6.99-34	2.35-33	4.84-33	8.36-33	1.34-32	2.06-32	3.14-32
25	1.03-28	-5.74-36	-3.75-35	-1.17-34	-2.63-34	-4.06-34	-2.08-34	7.81-34	2.72-33	5.69-33	1.00-32	1.63-32	2.56-32	3.99-32
24	1.17-28	-6.64-36	-4.34-35	-1.35-34	-3.09-34	-4.84-34	-2.71-34	8.75-34	3.17-33	6.77-33	1.21-32	2.01-32	3.24-32	5.20-32
23	1.33-28	-7.75-36	-5.05-35	-1.59-34	-3.66-34	-5.84-34	-3.56-34	9.80-34	3.74-33	8.16-33	1.49-32	2.54-32	4.21-32	6.99-32
22	1.53-28	-9.12-36	-5.93-35	-1.88-34	-4.38-34	-7.13-34	-4.76-34	1.10-33	4.44-33	9.99-33	1.88-32	3.29-32	5.65-32	9.82-32
21	1.76-28	-1.08-35	-7.03-35	-2.25-34	-5.31-34	-8.86-34	-6.47-34	1.22-33	5.35-33	1.24-32	2.41-32	4.39-32	7.90-32	1.36-31
20	2.05-28	-1.30-35	-8.43-35	-2.72-34	-6.53-34	-1.12-33	-8.96-34	1.33-33	6.52-33	1.58-32	3.20-32	6.10-32	1.11-31	2.33-31
19	2.40-28	-1.59-35	-1.02-34	-3.34-34	-8.17-34	-1.44-33	-1.27-33	1.42-33	8.07-33	2.07-32	4.41-32	8.94-32	1.85-31	4.17-31
18	2.83-28	-1.96-35	-1.26-34	-4.18-34	-1.04-33	-1.91-33	-1.86-33	1.41-33	1.02-32	2.80-32	6.37-32	1.41-31	3.29-31	8.92-31
17	3.38-28	-2.45-35	-1.58-34	-5.32-34	-1.36-33	-2.59-33	-2.81-33	1.16-33	1.30-32	3.95-32	9.87-32	2.46-31	6.95-31	2.04-30
16	4.08-28	-3.13-35	-2.02-34	-6.93-34	-1.83-33	-3.65-33	-4.42-33	3.44-34	1.69-32	5.90-32	1.69-31	5.11-31	2.02-30	1.72-29
15	5.00-28	-4.07-35	-2.64-34	-9.27-34	-2.53-33	-5.36-33	-7.32-33	-1.91-33	2.23-32	9.56-32	3.38-31	1.45-30	1.29-29	
14	6.21-28	-5.40-35	-3.52-34	-1.28-33	-3.65-33	-8.28-33	-1.29-32	-8.04-33	2.84-32	1.76-31	9.11-31	8.88-30		
13	7.86-28	-7.34-35	-4.84-34	-1.82-33	-5.51-33	-1.36-32	-2.49-32	-2.60-32	2.82-32	4.06-31	5.11-30			
12	1.02-27	-1.01-34	-6.85-34	-2.71-33	-8.81-33	-2.36-32	-5.38-32	-8.77-32	-4.69-32	1.60-30				
11	1.35-27	-1.42-34	-9.92-34	-4.19-33	-1.50-32	-4.85-32	-1.39-31	-3.81-31	-1.43-30					
10	1.84-27	-1.99-34	-1.45-33	-6.73-33	-2.78-32	-1.12-31	-4.84-31	-1.42-30						
9	2.62-27	-2.86-34	-2.08-33	-1.10-32	-5.62-32	-3.33-31	-1.46-30							
8	3.93-27	-4.51-34	-3.26-33	-1.79-32	-1.12-31	-1.85-30								
7	6.35-27	-7.53-34	-5.43-33	-3.23-32	-2.47-31									
6	1.14-26	1.23-34	-9.81-33	-1.08-31										
5	2.44-26	1.10-33	-1.11-32											
4	7.30-26	8.92-33												
3	5.29-25													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.28-33	2.88-33	3.60-33	4.47-33	5.50-33	6.76-33	8.27-33	1.01-32	1.23-32	1.50-32	1.83-32	2.24-32	2.74-32	3.36-32
45	1.39-33	1.74-33	2.19-33	2.73-33	3.40-33	4.23-33	5.25-33	6.52-33	8.10-33	1.01-32	1.26-32	1.57-32	1.96-32	2.45-32
40	5.42-33	7.06-33	9.13-33	1.17-32	1.51-32	1.93-32	2.49-32	3.21-32	4.16-32	5.44-32	7.17-32	9.56-32	1.29-31	1.78-31
35	9.67-33	1.30-32	1.73-32	2.31-32	3.10-32	4.17-32	5.67-32	7.79-32	1.09-31	1.55-31	2.27-31	3.42-31	5.40-31	9.01-31
30	2.06-32	2.92-32	4.19-32	5.96-32	8.69-32	1.30-31	1.99-31	3.19-31	5.41-31	9.90-31	2.03-30	5.00-30	1.72-29	1.31-28
29	2.48-32	3.57-32	5.17-32	7.60-32	1.14-31	1.76-31	2.84-31	4.82-31	8.85-31	1.82-30	4.50-30	1.55-29	1.19-28	
28	3.03-32	4.44-32	6.59-32	9.97-32	1.55-31	2.51-31	4.28-31	7.88-31	1.63-30	4.03-30	1.39-29	1.07-28		
27	3.77-32	5.66-32	8.63-32	1.35-31	2.20-31	3.77-31	6.98-31	1.45-30	3.60-30	1.24-29	9.58-29			
26	4.79-32	7.30-32	1.17-31	1.92-31	3.30-31	6.15-31	1.28-30	3.19-30	1.11-29	8.59-29				
25	6.25-32	1.00-31	1.65-31	2.87-31	5.37-31	1.12-30	2.81-30	9.81-30	7.60-29					
24	8.44-32	1.41-31	2.48-31	4.66-31	9.81-31	2.47-30	8.63-30	6.70-29						
23	1.19-31	2.11-31	4.01-31	8.49-31	2.15-30	7.95-30	5.88-29							
22	1.77-31	3.40-31	7.27-31	1.85-30	6.55-30	5.13-29								
21	2.89-31	6.16-31	1.58-30	5.60-30	4.44-29									
20	5.13-31	1.33-30	4.79-30	3.80-29										
19	1.10-30	4.01-30	3.21-29											
18	3.30-30	2.67-29												
17	2.18-29													

H TE = 5.00+03 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 4.519-13 4-2 RC = 5.380-14 4-2 EM = 2.199-25 2S RC = 1.334-13 2P RC = 3.185-13

NU	NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50		7.42-04	2.40-04	1.09-04	5.88-05	3.56-05	2.33-05	1.61-05	1.16-05	8.67-06	6.65-06	5.21-06	4.16-06	3.38-06	2.78-06
45		8.91-04	2.96-04	1.38-04	7.61-05	4.69-05	3.11-05	2.18-05	1.59-05	1.19-05	9.20-06	7.25-06	5.82-06	4.74-06	3.91-06
40		1.10-03	3.77-04	1.81-04	1.03-04	6.48-05	4.36-05	3.09-05	2.27-05	1.72-05	1.33-05	1.06-05	8.51-06	6.95-06	5.75-06
35		1.45-03	5.12-04	2.54-04	1.48-04	9.49-05	6.48-05	4.63-05	3.43-05	2.61-05	2.04-05	1.62-05	1.31-05	1.07-05	8.86-06
30		2.10-03	7.61-04	3.88-04	2.30-04	1.50-04	1.03-04	7.41-05	5.52-05	4.22-05	3.30-05	2.62-05	2.12-05	1.74-05	1.44-05
29		2.30-03	8.35-04	4.27-04	2.54-04	1.65-04	1.14-04	8.22-05	6.12-05	4.68-05	3.66-05	2.91-05	2.36-05	1.93-05	1.60-05
28		2.52-03	9.20-04	4.73-04	2.82-04	1.84-04	1.27-04	9.15-05	6.82-05	5.22-05	4.08-05	3.22-05	2.63-05	2.15-05	1.78-05
27		2.79-03	1.02-03	5.25-04	3.14-04	2.05-04	1.42-04	1.02-04	7.62-05	5.83-05	4.56-05	3.63-05	2.94-05	2.41-05	2.00-05
26		3.09-03	1.13-03	5.86-04	3.51-04	2.29-04	1.59-04	1.15-04	8.56-05	6.55-05	5.13-05	4.08-05	3.30-05	2.70-05	2.24-05
25		3.45-03	1.27-03	6.57-04	3.95-04	2.58-04	1.79-04	1.29-04	9.65-05	7.39-05	5.78-05	4.61-05	3.72-05	3.05-05	2.53-05
24		3.87-03	1.43-03	7.41-04	4.46-04	2.92-04	2.02-04	1.46-04	1.09-04	8.37-05	6.55-05	5.22-05	4.22-05	3.46-05	2.86-05
23		4.38-03	1.62-03	8.41-04	5.06-04	3.32-04	2.30-04	1.67-04	1.24-04	9.54-05	7.47-05	5.95-05	4.81-05	3.94-05	3.26-05
22		4.97-03	1.84-03	9.59-04	5.78-04	3.79-04	2.63-04	1.91-04	1.43-04	1.09-04	8.56-05	6.82-05	5.51-05	4.51-05	3.72-05
21		5.69-03	2.11-03	1.10-03	6.65-04	4.36-04	3.03-04	2.20-04	1.64-04	1.26-04	9.88-05	7.87-05	6.36-05	5.19-05	4.28-05
20		6.57-03	2.44-03	1.27-03	7.69-04	5.06-04	3.52-04	2.55-04	1.91-04	1.47-04	1.15-04	9.14-05	7.38-05	6.02-05	4.95-05
19		7.63-03	2.84-03	1.48-03	8.98-04	5.91-04	4.12-04	2.99-04	2.24-04	1.72-04	1.34-04	1.07-04	8.62-05	7.02-05	5.75-05
18		8.95-03	3.33-03	1.74-03	1.06-03	6.97-04	4.86-04	3.53-04	2.64-04	2.03-04	1.59-04	1.26-04	1.02-04	8.23-05	6.68-05
17		1.06-02	3.95-03	2.07-03	1.26-03	8.29-04	5.79-04	4.20-04	3.15-04	2.42-04	1.89-04	1.50-04	1.20-04	9.68-05	7.70-05
16		1.27-02	4.73-03	2.48-03	1.51-03	9.98-04	6.97-04	5.07-04	3.80-04	2.92-04	2.28-04	1.80-04	1.43-04	1.13-04	8.39-05
15		1.53-02	5.74-03	3.02-03	1.84-03	1.22-03	8.52-04	6.20-04	4.65-04	3.57-04	2.78-04	2.18-04	1.70-04	1.25-04	
14		1.88-02	7.05-03	3.72-03	2.27-03	1.51-03	1.06-03	7.69-04	5.77-04	4.42-04	3.42-04	2.63-04	1.92-04		
13		2.35-02	8.81-03	4.66-03	2.85-03	1.90-03	1.33-03	9.71-04	7.28-04	5.54-04	4.21-04	3.03-04			
12		2.98-02	1.12-02	5.95-03	3.65-03	2.44-03	1.71-03	1.25-03	9.33-04	6.99-04	4.97-04				
11		3.87-02	1.46-02	7.78-03	4.80-03	3.21-03	2.26-03	1.65-03	1.21-03	8.51-04					
10		5.15-02	1.95-02	1.05-02	6.49-03	4.36-03	3.07-03	2.21-03	1.53-03						
9		7.09-02	2.70-02	1.46-02	9.10-03	6.14-03	4.30-03	2.93-03							
8		1.02-01	3.90-02	2.13-02	1.34-02	9.02-03	6.02-03								
7		1.54-01	5.96-02	3.30-02	2.09-02	1.36-02									
6		2.51-01	9.87-02	5.56-02	3.46-02										
5		4.58-01	1.84-01	1.04-01											
4		1.00+00	4.10-01												
3		3.04+00													

NU	NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50		2.32-06	1.95-06	1.66-06	1.42-06	1.23-06	1.07-06	9.33-07	8.21-07	7.26-07	6.45-07	5.76-07	5.16-07	4.64-07	4.19-07
45		3.27-06	2.76-06	2.35-06	2.02-06	1.74-06	1.52-06	1.33-06	1.17-06	1.04-06	9.21-07	8.22-07	7.36-07	6.62-07	5.98-07
40		4.82-06	4.07-06	3.47-06	2.98-06	2.58-06	2.25-06	1.97-06	1.73-06	1.53-06	1.36-06	1.21-06	1.09-06	9.75-07	8.78-07
35		7.42-06	6.27-06	5.35-06	4.60-06	3.97-06	3.46-06	3.02-06	2.66-06	2.34-06	2.08-06	1.85-06	1.65-06	1.47-06	1.32-06
30		1.21-05	1.02-05	8.68-06	7.44-06	6.42-06	5.57-06	4.85-06	4.24-06	3.72-06	3.26-06	2.86-06	2.50-06	2.15-06	1.74-06
29		1.34-05	1.13-05	9.63-06	8.25-06	7.11-06	6.16-06	5.36-06	4.68-06	4.09-06	3.57-06	3.10-06	2.66-06	2.14-06	
28		1.49-05	1.26-05	1.07-05	9.18-06	7.90-06	6.84-06	5.93-06	5.16-06	4.49-06	3.88-06	3.31-06	2.66-06		
27		1.67-05	1.41-05	1.20-05	1.02-05	8.80-06	7.60-06	6.57-06	5.69-06	4.90-06	4.16-06	3.32-06			
26		1.87-05	1.58-05	1.34-05	1.15-05	9.83-06	8.46-06	7.28-06	6.24-06	5.27-06	4.19-06				
25		2.11-05	1.78-05	1.51-05	1.29-05	1.10-05	9.41-06	8.03-06	6.75-06	5.34-06					
24		2.39-05	2.01-05	1.70-05	1.45-05	1.23-05	1.04-05	8.72-06	6.87-06						
23		2.72-05	2.28-05	1.92-05	1.63-05	1.37-05	1.14-05	8.93-06							
22		3.10-05	2.60-05	2.18-05	1.83-05	1.51-05	1.17-05								
21		3.56-05	2.96-05	2.46-05	2.02-05	1.56-05									
20		4.09-05	3.38-05	2.75-05	2.11-05										
19		4.71-05	3.81-05	2.90-05											
18		5.36-05	4.05-05												
17		5.77-05													

H TE = 5.00+03 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50		0.00+00	2.67-37	1.10-37	-1.77-37	-6.10-37	-9.89-37	-8.14-37	8.23-37	5.38-36	1.50-35	3.29-35	6.32-35	1.12-34	1.87-34
45		0.00+00	4.13-37	3.39-37	2.64-37	2.36-37	5.61-37	1.88-36	5.33-36	1.26-35	2.64-35	5.04-35	8.97-35	1.51-34	2.45-34
40		0.00+00	6.45-37	7.20-37	1.02-36	1.68-36	3.13-36	6.12-36	1.20-35	2.25-35	4.08-35	7.07-35	1.18-34	1.91-34	3.01-34
35		0.00+00	1.01-36	1.32-36	2.21-36	3.95-36	7.07-36	1.25-35	2.15-35	3.60-35	5.90-35	9.44-35	1.48-34	2.28-34	3.47-34
30		0.00+00	1.63-36	2.29-36	4.14-36	7.64-36	1.36-35	2.30-35	3.75-35	5.88-35	8.98-35	1.34-34	1.96-34	2.83-34	4.04-34
29		0.00+00	1.81-36	2.56-36	4.68-36	8.68-36	1.54-35	2.61-35	4.23-35	6.60-35	9.97-35	1.47-34	2.12-34	3.02-34	4.23-34
28		0.00+00	2.01-36	2.87-36	5.30-36	9.89-36	1.76-35	2.98-35	4.81-35	7.46-35	1.12-34	1.63-34	2.33-34	3.25-34	4.46-34
27		0.00+00	2.25-36	3.23-36	6.02-36	1.13-35	2.02-35	3.42-35	5.51-35	8.51-35	1.27-34	1.84-34	2.59-34	3.55-34	4.75-34
26		0.00+00	2.52-36	3.65-36	6.86-36	1.30-35	2.33-35	3.95-35	6.37-35	9.83-35	1.46-34	2.10-34	2.92-34	3.94-34	5.09-34
25		0.00+00	2.84-36	4.15-36	7.85-36	1.50-35	2.70-35	4.60-35	7.44-35	1.15-34	1.71-34	2.44-34	3.36-34	4.44-34	5.50-34
24		0.00+00	3.22-36	4.73-36	9.04-36	1.74-35	3.16-35	5.41-35	8.78-35	1.36-34	2.02-34	2.89-34	3.95-34	5.08-34	5.92-34
23		0.00+00	3.68-36	5.43-36	1.05-35	2.03-35	3.72-35	6.43-35	1.05-34	1.64-34	2.44-34	3.49-34	4.73-34	5.90-34	6.22-34
22		0.00+00	4.22-36	6.28-36	1.22-35	2.40-35	4.44-35	7.73-35	1.28-34	2.00-34	3.01-34	4.31-34	5.78-34	6.91-34	6.01-34
21		0.00+00	4.88-36	7.32-36	1.44-35	2.85-35	5.35-35	9.42-35	1.57-34	2.50-34	3.79-34	5.45-34	7.22-34	8.02-34	4.07-34
20		0.00+00	5.69-36	8.61-36	1.71-35	3.44-35	6.53-35	1.17-34	1.98-34	3.19-34	4.90-34	7.08-34	9.18-34	8.77-34	-3.57-34
19		0.00+00	6.69-36	1.02-35	2.06-35	4.20-35	8.10-35	1.47-34	2.54-34	4.17-34	6.52-34	9.46-34	1.17-33	7.20-34	-3.19-33
18		0.00+00	7.94-36	1.23-35	2.52-35	5.21-35	1.02-34	1.90-34	3.35-34	5.63-34	8.96-34	1.30-33	1.44-33	-5.18-34	-1.52-32
17		0.00+00	9.54-36	1.49-35	3.11-35	6.58-35	1.32-34	2.52-34	4.56-34	7.88-34	1.28-33	1.83-33	1.37-33	-7.30-33	-8.67-32
16		0.00+00	1.16-35	1.84-35	3.92-35	8.49-35	1.75-34	3.44-34	6.45-34	1.16-33	1.92-33	2.51-33	-1.45-33	-5.42-32	-1.09-30
15		0.00+00	1.43-35	2.31-35	5.05-35	1.13-34	2.40-34	4.90-34	9.62-34	1.80-33	3.02-33	2.50-33	-2.85-32	-7.93-31	
14		0.00+00	1.79-35	2.97-35	6.67-35	1.54-34	3.44-34	7.38-34	1.53-33	3.03-33	4.75-33	-9.41-33	-5.34-31		
13		0.00+00	2.30-35	3.90-35	9.10-35	2.20-34	5.19-34	1.19-33	2.69-33	5.59-33	3.35-33	-3.21-31			
12		0.00+00	3.01-35	5.28-35	1.29-34	3.32-34	8.46-34	2.14-33	5.39-33	1.05-32	-1.56-31				
11		0.00+00	4.07-35	7.44-35	1.94-34	5.42-34	1.54-33	4.51-33	1.31-32	-4.06-32					
10		0.00+00	5.70-35	1.10-34	3.14-34	9.89-34	3.33-33	1.24-32	2.84-32						
9		0.00+00	8.39-35	1.76-34	5.68-34	2.16-33	9.84-33	5.81-32							
8		0.00+00	1.32-34	3.10-34	1.23-33	6.58-33	5.91-32								
7		0.00+00	2.28-34	6.47-34	3.71-33	4.41-32									
6		0.00+00	4.61-34	1.85-33	2.55-32										
5		0.00+00	1.23-33	1.16-32											
4		0.00+00	6.47-33												
3		0.00+00													

NU	NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50		2.98-34	4.59-34	6.88-34	1.01-33	1.45-33	2.05-33	2.87-33	3.98-33	5.46-33	7.43-33	1.01-32	1.36-32	1.83-32	2.45-32
45		3.84-34	5.86-34	8.74-34	1.28-33	1.85-33	2.63-33	3.72-33	5.21-33	7.26-33	1.01-32	1.39-32	1.93-32	2.67-32	3.71-32
40		4.62-34	6.98-34	1.04-33	1.52-33	2.21-33	3.19-33	4.57-33	6.54-33	9.34-33	1.34-32	1.92-32	2.77-32	4.04-32	5.97-32
35		5.20-34	7.73-34	1.14-33	1.68-33	2.46-33	3.61-33	5.30-33	7.84-33	1.17-32	1.77-32	2.73-32	4.31-32	7.06-32	1.21-31
30		5.73-34	8.09-34	1.14-33	1.60-33	2.26-33	3.18-33	4.50-33	6.37-33	8.94-33	1.22-32	1.50-32	9.88-33	-5.02-32	-5.49-31
29		5.87-34	8.07-34	1.10-33	1.48-33	1.96-33	2.53-33	3.06-33	3.13-33	1.20-33	-8.27-33	-4.92-32	-2.63-31	-2.36-30	
28		6.02-34	7.94-34	1.02-33	1.24-33	1.38-33	1.14-33	-2.34-34	-5.12-33	-2.16-32	-8.32-32	-3.87-31	-3.47-30		
27		6.14-34	7.56-34	8.53-34	7.73-34	1.72-34	-1.89-33	-8.19-33	-2.80-32	-9.96-32	-4.49-31	-4.06-30			
26		6.20-34	6.71-34	5.25-34	-1.78-34	-2.41-33	-9.03-33	-2.96-32	-1.04-31	-4.67-31	-4.30-30				
25		6.05-34	4.82-34	-1.56-34	-2.23-33	-8.46-33	-2.80-32	-9.92-32	-4.54-31	-4.28-30					
24		5.38-34	5.68-35	-1.66-33	-7.07-33	-2.46-32	-8.97-32	-4.21-31	-4.09-30						
23		3.37-34	-9.40-34	-5.30-33	-2.01-32	-7.72-32	-3.77-31	-3.79-30							
22		-2.16-34	-3.47-33	-1.53-32	-6.34-32	-3.25-31	-3.43-30								
21		-1.78-33	-1.07-32	-4.96-32	-2.72-31	-3.02-30									
20		-6.63-33	-3.66-32	-2.20-31	-2.61-30										
19		-2.50-32	-1.70-31	-2.20-30											
18		-1.26-31	-1.80-30												
17		-1.43-30													

H TE = 5.00+03 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 4.530-13 4-2 RC = 5.400-14 4-2 EM = 2.207-25 2S RC = 1.341-13 2P RC = 3.189-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.77-04	3.02-04	1.31-04	6.85-05	4.02-05	2.56-05	1.73-05	1.23-05	9.02-06	6.82-06	5.28-06	4.17-06	3.36-06	2.74-06
45	1.24-03	3.86-04	1.69-04	8.86-05	5.23-05	3.35-05	2.28-05	1.62-05	1.19-05	9.04-06	7.02-06	5.56-06	4.48-06	3.66-06
40	1.58-03	5.02-04	2.23-04	1.18-04	7.08-05	4.57-05	3.13-05	2.24-05	1.66-05	1.27-05	9.87-06	7.85-06	6.34-06	5.20-06
35	2.03-03	6.62-04	3.02-04	1.64-04	1.00-04	6.57-05	4.56-05	3.30-05	2.46-05	1.89-05	1.48-05	1.19-05	9.64-06	7.93-06
30	2.68-03	9.08-04	4.32-04	2.43-04	1.52-04	1.02-04	7.18-05	5.26-05	3.97-05	3.07-05	2.43-05	1.95-05	1.59-05	1.31-05
29	2.85-03	9.77-04	4.69-04	2.66-04	1.67-04	1.13-04	7.95-05	5.84-05	4.42-05	3.42-05	2.71-05	2.18-05	1.78-05	1.47-05
28	3.06-03	1.06-03	5.11-04	2.93-04	1.85-04	1.25-04	8.85-05	6.52-05	4.94-05	3.83-05	3.03-05	2.44-05	1.99-05	1.65-05
27	3.29-03	1.15-03	5.61-04	3.23-04	2.05-04	1.39-04	9.90-05	7.30-05	5.54-05	4.30-05	3.41-05	2.75-05	2.24-05	1.85-05
26	3.57-03	1.25-03	6.19-04	3.59-04	2.29-04	1.56-04	1.11-04	8.22-05	6.24-05	4.86-05	3.85-05	3.10-05	2.53-05	2.09-05
25	3.90-03	1.38-03	6.87-04	4.01-04	2.57-04	1.76-04	1.26-04	9.29-05	7.07-05	5.50-05	4.36-05	3.52-05	2.87-05	2.37-05
24	4.28-03	1.53-03	7.67-04	4.51-04	2.90-04	1.99-04	1.42-04	1.06-04	8.04-05	6.26-05	4.97-05	4.00-05	3.27-05	2.70-05
23	4.75-03	1.71-03	8.63-04	5.10-04	3.30-04	2.26-04	1.62-04	1.21-04	9.19-05	7.16-05	5.68-05	4.58-05	3.74-05	3.08-05
22	5.31-03	1.92-03	9.78-04	5.81-04	3.77-04	2.59-04	1.86-04	1.38-04	1.06-04	8.24-05	6.53-05	5.26-05	4.29-05	3.53-05
21	6.00-03	2.18-03	1.12-03	6.66-04	4.33-04	2.99-04	2.15-04	1.60-04	1.22-04	9.52-05	7.56-05	6.08-05	4.95-05	4.07-05
20	6.83-03	2.50-03	1.29-03	7.70-04	5.02-04	3.47-04	2.50-04	1.86-04	1.42-04	1.11-04	8.79-05	7.07-05	5.75-05	4.71-05
19	7.86-03	2.89-03	1.49-03	8.97-04	5.87-04	4.06-04	2.93-04	2.18-04	1.67-04	1.30-04	1.03-04	8.27-05	6.70-05	5.47-05
18	9.15-03	3.37-03	1.75-03	1.05-03	6.91-04	4.79-04	3.46-04	2.58-04	1.97-04	1.54-04	1.22-04	9.73-05	7.86-05	6.36-05
17	1.08-02	3.99-03	2.08-03	1.25-03	8.23-04	5.71-04	4.13-04	3.08-04	2.35-04	1.83-04	1.45-04	1.15-04	9.23-05	7.32-05
16	1.28-02	4.76-03	2.49-03	1.51-03	9.90-04	6.88-04	4.98-04	3.72-04	2.83-04	2.20-04	1.73-04	1.37-04	1.08-04	8.00-05
15	1.55-02	5.76-03	3.02-03	1.83-03	1.21-03	8.40-04	6.09-04	4.54-04	3.46-04	2.68-04	2.09-04	1.62-04	1.19-04	
14	1.89-02	7.07-03	3.72-03	2.26-03	1.49-03	1.04-03	7.55-04	5.62-04	4.28-04	3.29-04	2.52-04	1.83-04		
13	2.36-02	8.83-03	4.65-03	2.84-03	1.88-03	1.31-03	9.51-04	7.08-04	5.35-04	4.04-04	2.89-04			
12	2.99-02	1.12-02	5.94-03	3.63-03	2.41-03	1.69-03	1.22-03	9.05-04	6.72-04	4.75-04				
11	3.88-02	1.46-02	7.76-03	4.77-03	3.17-03	2.22-03	1.60-03	1.17-03	8.14-04					
10	5.17-02	1.95-02	1.04-02	6.44-03	4.30-03	3.01-03	2.14-03	1.47-03						
9	7.11-02	2.70-02	1.45-02	9.02-03	6.04-03	4.18-03	2.81-03							
8	1.02-01	3.90-02	2.12-02	1.32-02	8.83-03	5.81-03								
7	1.54-01	5.95-02	3.28-02	2.06-02	1.32-02									
6	2.52-01	9.85-02	5.50-02	3.37-02										
5	4.59-01	1.83-01	1.02-01											
4	1.00+00	4.05-01												
3	3.02+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.27-06	1.89-06	1.60-06	1.36-06	1.17-06	1.01-06	8.84-07	7.75-07	6.83-07	6.05-07	5.39-07	4.81-07	4.32-07	3.89-07
45	3.03-06	2.54-06	2.15-06	1.83-06	1.58-06	1.37-06	1.19-06	1.05-06	9.22-07	8.17-07	7.28-07	6.51-07	5.84-07	5.26-07
40	4.32-06	3.63-06	3.07-06	2.63-06	2.26-06	1.96-06	1.71-06	1.51-06	1.33-06	1.18-06	1.05-06	9.39-07	8.43-07	7.59-07
35	6.61-06	5.56-06	4.73-06	4.05-06	3.50-06	3.04-06	2.65-06	2.33-06	2.06-06	1.82-06	1.62-06	1.45-06	1.30-06	1.16-06
30	1.10-05	9.25-06	7.87-06	6.74-06	5.82-06	5.05-06	4.40-06	3.86-06	3.39-06	2.98-06	2.62-06	2.30-06	1.99-06	1.62-06
29	1.23-05	1.03-05	8.79-06	7.53-06	6.49-06	5.63-06	4.90-06	4.29-06	3.75-06	3.29-06	2.87-06	2.47-06	2.01-06	
28	1.38-05	1.16-05	9.85-06	8.44-06	7.26-06	6.29-06	5.47-06	4.76-06	4.15-06	3.61-06	3.09-06	2.50-06		
27	1.55-05	1.30-05	1.11-05	9.47-06	8.14-06	7.04-06	6.10-06	5.29-06	4.57-06	3.90-06	3.13-06			
26	1.75-05	1.47-05	1.25-05	1.07-05	9.15-06	7.88-06	6.79-06	5.84-06	4.95-06	3.96-06				
25	1.98-05	1.66-05	1.41-05	1.20-05	1.03-05	8.81-06	7.53-06	6.35-06	5.06-06					
24	2.25-05	1.89-05	1.60-05	1.36-05	1.16-05	9.81-06	8.23-06	6.52-06						
23	2.56-05	2.15-05	1.81-05	1.53-05	1.29-05	1.08-05	8.48-06							
22	2.94-05	2.45-05	2.06-05	1.72-05	1.43-05	1.12-05								
21	3.37-05	2.81-05	2.33-05	1.92-05	1.49-05									
20	3.88-05	3.20-05	2.61-05	2.01-05										
19	4.47-05	3.61-05	2.76-05											
18	5.09-05	3.86-05												
17	5.50-05													

H TE = 5.00+03 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.77-37	-2.57-37	-1.21-36	-2.94-36	-5.53-36	-8.75-36	-1.20-35	-1.41-35	-1.32-35	-6.27-36	1.06-35	4.32-35	9.89-35
45	0.00+00	2.84-37	-1.89-37	-1.19-36	-2.94-36	-5.33-36	-7.81-36	-9.15-36	-7.19-36	1.49-36	2.20-35	6.17-35	1.31-34	2.44-34
40	0.00+00	4.74-37	4.41-39	-9.40-37	-2.48-36	-4.28-36	-5.30-36	-3.46-36	4.78-36	2.50-35	6.56-35	1.39-34	2.63-34	4.63-34
35	0.00+00	8.38-37	5.17-37	-1.28-38	-6.92-37	-7.83-37	1.45-36	9.23-36	2.80-35	6.63-35	1.38-34	2.62-34	4.69-34	8.04-34
30	0.00+00	1.53-36	1.65-36	2.23-36	3.68-36	7.27-36	1.56-35	3.32-35	6.76-35	1.31-34	2.44-34	4.36-34	7.58-34	1.29-33
29	0.00+00	1.74-36	1.98-36	2.91-36	4.99-36	9.65-36	1.96-35	3.97-35	7.80-35	1.47-34	2.69-34	4.77-34	8.24-34	1.40-33
28	0.00+00	1.96-36	2.36-36	3.68-36	6.48-36	1.23-35	2.42-35	4.70-35	8.92-35	1.65-34	2.96-34	5.19-34	8.93-34	1.52-33
27	0.00+00	2.22-36	2.79-36	4.55-36	8.19-36	1.54-35	2.93-35	5.51-35	1.02-34	1.84-34	3.24-34	5.63-34	9.65-34	1.64-33
26	0.00+00	2.52-36	3.29-36	5.55-36	1.01-35	1.89-35	3.52-35	6.44-35	1.16-34	2.05-34	3.56-34	6.12-34	1.04-33	1.77-33
25	0.00+00	2.87-36	3.85-36	6.70-36	1.24-35	2.30-35	4.20-35	7.52-35	1.32-34	2.29-34	3.92-34	6.65-34	1.13-33	1.91-33
24	0.00+00	3.27-36	4.50-36	8.03-36	1.50-35	2.77-35	5.00-35	8.80-35	1.52-34	2.58-34	4.34-34	7.27-34	1.22-33	2.07-33
23	0.00+00	3.73-36	5.25-36	9.57-36	1.81-35	3.34-35	5.97-35	1.04-34	1.76-34	2.93-34	4.85-34	8.01-34	1.33-33	2.23-33
22	0.00+00	4.29-36	6.15-36	1.14-35	2.18-35	4.03-35	7.17-35	1.23-34	2.06-34	3.38-34	5.49-34	8.91-34	1.45-33	2.39-33
21	0.00+00	4.96-36	7.21-36	1.36-35	2.63-35	4.89-35	8.68-35	1.48-34	2.46-34	3.98-34	6.35-34	1.00-33	1.58-33	2.47-33
20	0.00+00	5.77-36	8.52-36	1.64-35	3.20-35	5.98-35	1.07-34	1.82-34	3.00-34	4.80-34	7.51-34	1.15-33	1.68-33	2.24-33
19	0.00+00	6.77-36	1.01-35	1.95-35	3.92-35	7.42-35	1.33-34	2.28-34	3.76-34	5.99-34	9.15-34	1.31-33	1.61-33	1.77-34
18	0.00+00	8.02-36	1.22-35	2.42-35	4.87-35	9.35-35	1.70-34	2.95-34	4.89-34	7.74-34	1.15-33	1.44-33	7.35-34	-6.32-33
17	0.00+00	9.61-36	1.48-35	3.00-35	6.15-35	1.20-34	2.23-34	3.93-34	6.60-34	1.04-33	1.46-33	1.20-33	-4.08-33	-4.91-32
16	0.00+00	1.17-35	1.82-35	3.78-35	7.94-35	1.59-34	3.03-34	5.47-34	9.37-34	1.47-33	1.75-33	-1.35-33	-3.56-32	-6.12-31
15	0.00+00	1.44-35	2.29-35	4.86-35	1.05-34	2.18-34	4.28-34	8.01-34	1.41-33	2.14-33	1.12-33	-2.18-32	-4.82-31	
14	0.00+00	1.80-35	2.93-35	6.42-35	1.44-34	3.10-34	6.38-34	1.25-33	2.28-33	2.94-33	-9.67-33	-3.52-31		
13	0.00+00	2.30-35	3.85-35	8.75-35	2.05-34	4.66-34	1.02-33	2.14-33	3.93-33	-1.86-34	-2.32-31			
12	0.00+00	3.02-35	5.21-35	1.24-34	3.09-34	7.55-34	1.81-33	4.14-33	6.14-33	-1.28-31				
11	0.00+00	4.08-35	7.33-35	1.86-34	5.02-34	1.36-33	3.71-33	9.32-33	-4.65-32					
10	0.00+00	5.71-35	1.09-34	3.00-34	9.11-34	2.90-33	9.79-33	9.52-33						
9	0.00+00	8.40-35	1.73-34	5.41-34	1.97-33	8.32-33	3.95-32							
8	0.00+00	1.32-34	3.04-34	1.17-33	5.90-33	4.66-32								
7	0.00+00	2.29-34	6.34-34	3.48-33	3.80-32									
6	0.00+00	4.61-34	1.80-33	2.33-32										
5	0.00+00	1.23-33	1.12-32											
4	0.00+00	6.45-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.88-34	3.23-34	5.22-34	8.04-34	1.20-33	1.74-33	2.47-33	3.43-33	4.70-33	6.34-33	8.46-33	1.12-32	1.46-32	1.88-32
45	4.20-34	6.85-34	1.07-33	1.64-33	2.43-33	3.54-33	5.08-33	7.19-33	1.01-32	1.40-32	1.93-32	2.65-32	3.62-32	4.93-32
40	7.75-34	1.25-33	1.96-33	3.00-33	4.52-33	6.71-33	9.88-33	1.44-32	2.10-32	3.05-32	4.42-32	6.44-32	9.44-32	1.40-31
35	1.33-33	2.16-33	3.42-33	5.36-33	8.31-33	1.28-32	1.98-32	3.06-32	4.76-32	7.50-32	1.20-31	1.98-31	3.37-31	6.04-31
30	2.15-33	3.55-33	5.83-33	9.58-33	1.58-32	2.65-32	4.52-32	7.96-32	1.47-31	2.89-31	6.33-31	1.64-30	5.86-30	4.57-29
29	2.35-33	3.90-33	6.49-33	1.08-32	1.83-32	3.14-32	5.56-32	1.03-31	2.03-31	4.45-31	1.15-30	4.11-30	3.19-29	
28	2.55-33	4.29-33	7.22-33	1.23-32	2.12-32	3.78-32	7.02-32	1.39-31	3.04-31	7.86-31	2.78-30	2.14-29		
27	2.78-33	4.71-33	8.06-33	1.40-32	2.50-32	4.66-32	9.22-32	2.01-31	5.17-31	1.81-30	1.38-29			
26	3.02-33	5.18-33	9.03-33	1.61-32	3.00-32	5.93-32	1.29-31	3.27-31	1.13-30	8.49-30				
25	3.28-33	5.70-33	1.02-32	1.88-32	3.68-32	7.88-32	1.97-31	6.64-31	4.85-30					
24	3.56-33	6.26-33	1.14-32	2.19-32	4.58-32	1.11-31	3.56-31	2.46-30						
23	3.83-33	6.77-33	1.25-32	2.49-32	5.60-32	1.61-31	9.44-31							
22	4.01-33	6.91-33	1.23-32	2.29-32	4.26-32	2.27-32								
21	3.79-33	5.36-33	4.60-33	-2.30-32	-4.95-31									
20	1.98-33	-4.12-33	-5.40-32	-7.48-31										
19	-6.90-33	-6.34-32	-8.31-31											
18	-5.98-32	-8.11-31												
17	-7.27-31													

H TE = 5.00+03 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 4.551-13 4-2 RC = 5.437-14 4-2 EM = 2.222-25 2S RC = 1.354-13 2P RC = 3.197-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.25-03	3.85-04	1.66-04	8.60-05	5.02-05	3.19-05	2.15-05	1.51-05	1.11-05	8.34-06	6.44-06	5.08-06	4.07-06	3.32-06
45	1.56-03	4.81-04	2.07-04	1.07-04	6.28-05	3.99-05	2.69-05	1.90-05	1.39-05	1.05-05	8.08-06	6.37-06	5.11-06	4.16-06
40	2.00-03	6.16-04	2.66-04	1.38-04	8.10-05	5.15-05	3.47-05	2.46-05	1.80-05	1.36-05	1.05-05	8.28-06	6.65-06	5.42-06
35	2.68-03	8.32-04	3.61-04	1.89-04	1.11-04	7.09-05	4.80-05	3.40-05	2.50-05	1.89-05	1.46-05	1.16-05	9.31-06	7.60-06
30	3.76-03	1.18-03	5.21-04	2.76-04	1.64-04	1.06-04	7.22-05	5.15-05	3.81-05	2.89-05	2.25-05	1.79-05	1.44-05	1.18-05
29	4.03-03	1.27-03	5.64-04	3.00-04	1.79-04	1.16-04	7.92-05	5.66-05	4.19-05	3.19-05	2.49-05	1.98-05	1.60-05	1.31-05
28	4.32-03	1.37-03	6.12-04	3.27-04	1.96-04	1.27-04	8.73-05	6.26-05	4.64-05	3.54-05	2.76-05	2.20-05	1.78-05	1.46-05
27	4.63-03	1.48-03	6.66-04	3.58-04	2.16-04	1.40-04	9.67-05	6.95-05	5.17-05	3.95-05	3.08-05	2.46-05	1.99-05	1.63-05
26	4.97-03	1.61-03	7.26-04	3.93-04	2.38-04	1.56-04	1.08-04	7.76-05	5.78-05	4.43-05	3.47-05	2.76-05	2.24-05	1.84-05
25	5.34-03	1.74-03	7.95-04	4.34-04	2.65-04	1.74-04	1.21-04	8.72-05	6.52-05	5.00-05	3.92-05	3.13-05	2.54-05	2.09-05
24	5.75-03	1.90-03	8.75-04	4.82-04	2.95-04	1.95-04	1.36-04	9.87-05	7.39-05	5.68-05	4.46-05	3.57-05	2.90-05	2.38-05
23	6.21-03	2.07-03	9.68-04	5.38-04	3.32-04	2.21-04	1.54-04	1.12-04	8.45-05	6.51-05	5.12-05	4.10-05	3.33-05	2.74-05
22	6.75-03	2.28-03	1.08-03	6.05-04	3.77-04	2.52-04	1.77-04	1.29-04	9.72-05	7.50-05	5.91-05	4.73-05	3.84-05	3.16-05
21	7.39-03	2.52-03	1.21-03	6.86-04	4.30-04	2.89-04	2.04-04	1.49-04	1.13-04	8.72-05	6.87-05	5.51-05	4.47-05	3.67-05
20	8.16-03	2.82-03	1.37-03	7.85-04	4.96-04	3.35-04	2.37-04	1.74-04	1.32-04	1.02-04	8.05-05	6.45-05	5.23-05	4.28-05
19	9.11-03	3.19-03	1.57-03	9.07-04	5.77-04	3.92-04	2.79-04	2.05-04	1.55-04	1.20-04	9.49-05	7.59-05	6.14-05	5.01-05
18	1.03-02	3.64-03	1.81-03	1.06-03	6.79-04	4.63-04	3.30-04	2.44-04	1.85-04	1.43-04	1.13-04	8.99-05	7.24-05	5.86-05
17	1.18-02	4.22-03	2.13-03	1.25-03	8.07-04	5.53-04	3.95-04	2.92-04	2.21-04	1.71-04	1.35-04	1.07-04	8.55-05	6.78-05
16	1.37-02	4.96-03	2.53-03	1.50-03	9.71-04	6.67-04	4.78-04	3.54-04	2.68-04	2.07-04	1.62-04	1.28-04	1.00-04	7.45-05
15	1.63-02	5.92-03	3.04-03	1.82-03	1.18-03	8.16-04	5.85-04	4.33-04	3.28-04	2.52-04	1.96-04	1.51-04	1.11-04	
14	1.96-02	7.20-03	3.73-03	2.24-03	1.46-03	1.01-03	7.26-04	5.37-04	4.05-04	3.09-04	2.36-04	1.71-04		
13	2.41-02	8.93-03	4.66-03	2.81-03	1.84-03	1.27-03	9.15-04	6.75-04	5.06-04	3.79-04	2.71-04			
12	3.04-02	1.13-02	5.93-03	3.59-03	2.36-03	1.64-03	1.17-03	8.60-04	6.33-04	4.45-04				
11	3.92-02	1.47-02	7.73-03	4.71-03	3.10-03	2.15-03	1.54-03	1.11-03	7.64-04					
10	5.20-02	1.96-02	1.04-02	6.35-03	4.20-03	2.90-03	2.04-03	1.38-03						
9	7.14-02	2.70-02	1.44-02	8.87-03	5.87-03	4.01-03	2.66-03							
8	1.02-01	3.89-02	2.10-02	1.30-02	8.52-03	5.50-03								
7	1.55-01	5.94-02	3.24-02	2.00-02	1.25-02									
6	2.53-01	9.81-02	5.41-02	3.24-02										
5	4.60-01	1.82-01	9.90-02											
4	1.00+00	3.96-01												
3	3.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.74-06	2.28-06	1.93-06	1.64-06	1.41-06	1.22-06	1.06-06	9.26-07	8.15-07	7.22-07	6.42-07	5.73-07	5.14-07	4.62-07
45	3.44-06	2.87-06	2.42-06	2.06-06	1.77-06	1.53-06	1.33-06	1.16-06	1.03-06	9.07-07	8.06-07	7.20-07	6.45-07	5.81-07
40	4.48-06	3.74-06	3.15-06	2.69-06	2.30-06	1.99-06	1.73-06	1.52-06	1.34-06	1.18-06	1.05-06	9.38-07	8.41-07	7.56-07
35	6.28-06	5.25-06	4.43-06	3.78-06	3.24-06	2.81-06	2.44-06	2.14-06	1.88-06	1.66-06	1.48-06	1.32-06	1.18-06	1.05-06
30	9.78-06	8.19-06	6.93-06	5.91-06	5.08-06	4.39-06	3.82-06	3.34-06	2.93-06	2.58-06	2.27-06	2.00-06	1.73-06	1.42-06
29	1.08-05	9.09-06	7.69-06	6.56-06	5.64-06	4.88-06	4.24-06	3.70-06	3.24-06	2.85-06	2.49-06	2.15-06	1.75-06	
28	1.21-05	1.01-05	8.58-06	7.32-06	6.29-06	5.44-06	4.72-06	4.12-06	3.59-06	3.13-06	2.69-06	2.19-06		
27	1.35-05	1.14-05	9.62-06	8.21-06	7.05-06	6.09-06	5.28-06	4.59-06	3.98-06	3.40-06	2.75-06			
26	1.53-05	1.28-05	1.09-05	9.26-06	7.95-06	6.85-06	5.92-06	5.10-06	4.35-06	3.50-06				
25	1.73-05	1.46-05	1.23-05	1.05-05	8.99-06	7.72-06	6.62-06	5.61-06	4.50-06					
24	1.98-05	1.66-05	1.40-05	1.19-05	1.02-05	8.69-06	7.32-06	5.84-06						
23	2.27-05	1.91-05	1.61-05	1.36-05	1.15-05	9.66-06	7.65-06							
22	2.62-05	2.19-05	1.84-05	1.55-05	1.29-05	1.01-05								
21	3.04-05	2.53-05	2.11-05	1.74-05	1.36-05									
20	3.53-05	2.92-05	2.39-05	1.85-05										
19	4.10-05	3.32-05	2.55-05											
18	4.70-05	3.58-05												
17	5.11-05													

H TE = 5.00+03 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	6.99-38	-7.30-37	-2.69-36	-6.70-36	-1.38-35	-2.53-35	-4.28-35	-6.81-35	-1.04-34	-1.53-34	-2.19-34	-3.09-34	-4.32-34
45	0.00+00	1.58-37	-7.41-37	-2.89-36	-7.18-36	-1.46-35	-2.61-35	-4.28-35	-6.59-35	-9.66-35	-1.37-34	-1.98-34	-2.55-34	-3.43-34
40	0.00+00	3.14-37	-6.80-37	-2.97-36	-7.37-36	-1.45-35	-2.48-35	-3.81-35	-5.38-35	-7.05-35	-8.56-35	-9.60-35	-9.71-35	-8.45-35
35	0.00+00	5.88-37	-5.29-37	-3.00-36	-7.48-36	-1.41-35	-2.22-35	-2.95-35	-3.22-35	-2.31-35	8.72-36	7.96-35	2.13-34	4.44-34
30	0.00+00	1.14-36	-2.87-38	-2.45-36	-6.53-36	-1.15-35	-1.47-35	-1.03-35	1.24-35	7.18-35	1.98-34	4.41-34	8.78-34	1.63-33
29	0.00+00	1.32-36	1.82-37	-2.12-36	-5.89-36	-1.01-35	-1.14-35	-3.07-36	2.78-35	1.03-34	2.61-34	5.61-34	1.10-33	2.04-33
28	0.00+00	1.53-36	4.56-37	-1.66-36	-4.98-36	-8.13-36	-7.20-36	6.02-36	4.68-35	1.42-34	3.36-34	7.05-34	1.37-33	2.55-33
27	0.00+00	1.79-36	8.06-37	-1.03-36	-3.73-36	-5.53-36	-1.75-36	1.73-35	6.98-35	1.88-34	4.26-34	8.79-34	1.71-33	3.19-33
26	0.00+00	2.09-36	1.25-36	-1.95-37	-2.06-36	-2.15-36	5.13-36	3.12-35	9.75-35	2.42-34	5.34-34	1.09-33	2.11-33	3.98-33
25	0.00+00	2.45-36	1.81-36	8.85-37	1.04-37	2.18-36	1.37-35	4.81-35	1.31-34	3.08-34	6.61-34	1.34-33	2.61-33	4.98-33
24	0.00+00	2.89-36	2.51-36	2.26-36	2.86-36	7.61-36	2.42-35	6.84-35	1.70-34	3.84-34	8.13-34	1.64-33	3.23-33	6.25-33
23	0.00+00	3.41-36	3.36-36	3.98-36	6.32-36	1.43-35	3.70-35	9.27-35	2.16-34	4.75-34	9.93-34	2.01-33	4.00-33	7.91-33
22	0.00+00	4.04-36	4.40-36	6.10-36	1.06-35	2.26-35	5.26-35	1.22-34	2.71-34	5.81-34	1.21-33	2.46-33	4.97-33	1.01-32
21	0.00+00	4.79-36	5.66-36	8.71-36	1.59-35	3.28-35	7.14-35	1.56-34	3.36-34	7.07-34	1.46-33	3.01-33	6.24-33	1.32-32
20	0.00+00	5.69-36	7.19-36	1.19-35	2.24-35	4.52-35	9.45-35	1.99-34	4.15-34	8.60-34	1.78-33	3.72-33	7.96-33	1.78-32
19	0.00+00	6.78-36	9.04-36	1.58-35	3.04-35	6.08-35	1.23-34	2.51-34	5.11-34	1.05-33	2.18-33	4.65-33	1.04-32	2.50-32
18	0.00+00	8.12-36	1.13-35	2.07-35	4.05-35	8.04-35	1.60-34	3.18-34	6.36-34	1.29-33	2.70-33	5.91-33	1.40-32	3.75-32
17	0.00+00	9.78-36	1.41-35	2.68-35	5.34-35	1.06-34	2.09-34	4.09-34	8.07-34	1.63-33	3.42-33	7.69-33	1.94-32	6.03-32
16	0.00+00	1.19-35	1.77-35	3.47-35	7.07-35	1.42-34	2.79-34	5.41-34	1.06-33	2.11-33	4.42-33	9.86-33	2.38-32	3.20-32
15	0.00+00	1.46-35	2.24-35	4.53-35	9.47-35	1.93-34	3.83-34	7.48-34	1.45-33	2.85-33	5.47-33	7.39-33	-9.50-32	
14	0.00+00	1.83-35	2.88-35	6.03-35	1.30-34	2.73-34	5.54-34	1.10-33	2.14-33	3.81-33	2.23-33	-1.29-31		
13	0.00+00	2.33-35	3.78-35	8.23-35	1.85-34	4.05-34	8.59-34	1.77-33	3.35-33	2.49-33	-1.14-31			
12	0.00+00	3.05-35	5.11-35	1.17-34	2.77-34	6.46-34	1.47-33	3.19-33	4.58-33	-7.78-32				
11	0.00+00	4.11-35	7.18-35	1.74-34	4.48-34	1.15-33	2.91-33	6.48-33	-3.62-32					
10	0.00+00	5.74-35	1.06-34	2.81-34	8.05-34	2.39-33	7.22-33	-9.13-36						
9	0.00+00	8.44-35	1.68-34	5.03-34	1.72-33	6.61-33	2.42-32							
8	0.00+00	1.33-34	2.96-34	1.07-33	5.03-33	3.39-32								
7	0.00+00	2.29-34	6.14-34	3.16-33	3.08-32									
6	0.00+00	4.62-34	1.73-33	2.06-32										
5	0.00+00	1.23-33	1.05-32											
4	0.00+00	6.42-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.99-34	-8.29-34	-1.15-33	-1.59-33	-2.22-33	-3.10-33	-4.34-33	-6.08-33	-8.52-33	-1.19-32	-1.66-32	-2.32-32	-3.22-32	-4.46-32
45	-4.61-34	-6.25-34	-8.60-34	-1.21-33	-1.72-33	-2.50-33	-3.68-33	-5.45-33	-8.11-33	-1.21-32	-1.80-32	-2.67-32	-3.96-32	-5.87-32
40	-5.41-35	-4.28-36	6.04-35	1.23-34	1.49-34	6.65-35	-2.49-34	-1.01-33	-2.58-33	-5.55-33	-1.09-32	-2.03-32	-3.66-32	-6.48-32
35	8.16-34	1.39-33	2.26-33	3.51-33	5.29-33	7.78-33	1.12-32	1.58-32	2.18-32	2.96-32	3.95-32	5.10-32	6.24-32	6.62-32
30	2.89-33	4.98-33	8.38-33	1.39-32	2.30-32	3.82-32	6.40-32	1.10-31	1.96-31	3.70-31	7.72-31	1.90-30	6.38-30	4.65-29
29	3.64-33	6.33-33	1.08-32	1.84-32	3.13-32	5.38-32	9.47-32	1.73-31	3.35-31	7.16-31	1.81-30	6.25-30	4.70-29	
28	4.59-33	8.09-33	1.41-32	2.46-32	4.34-32	7.80-32	1.46-31	2.89-31	6.31-31	1.63-30	5.74-30	4.41-29		
27	5.80-33	1.04-32	1.86-32	3.35-32	6.17-32	1.18-31	2.38-31	5.30-31	1.39-30	5.00-30	3.91-29			
26	7.35-33	1.35-32	2.49-32	4.67-32	9.09-32	1.87-31	4.25-31	1.14-30	4.14-30	3.28-29				
25	9.38-33	1.77-32	3.40-32	6.74-32	1.41-31	3.26-31	8.83-31	3.26-30	2.60-29					
24	1.22-32	2.37-32	4.78-32	1.02-31	2.39-31	6.55-31	2.44-30	1.96-29						
23	1.61-32	3.25-32	7.05-32	1.67-31	4.63-31	1.74-30	1.40-29							
22	2.16-32	4.65-32	1.11-31	3.11-31	1.17-30	9.39-30								
21	2.94-32	7.10-32	1.99-31	7.48-31	5.92-30									
20	4.31-32	1.21-31	4.50-31	3.48-30										
19	6.92-32	2.52-31	1.87-30											
18	1.30-31	8.83-31												
17	3.21-31													

H TE = 5.00+03 NE = 1.00+05 CASE B NC = 58

TOTAL RC = 4.592-13 4-2 RC = 5.498-14 4-2 EM = 2.247-25 2S RC = 1.377-13 2P RC = 3.216-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.48-03	4.55-04	1.96-04	1.01-04	5.92-05	3.75-05	2.52-05	1.78-05	1.30-05	9.79-06	7.55-06	5.95-06	4.77-06	3.88-06
45	1.95-03	6.00-04	2.58-04	1.34-04	7.79-05	4.94-05	3.32-05	2.34-05	1.71-05	1.29-05	9.95-06	7.84-06	6.28-06	5.12-06
40	2.59-03	7.95-04	3.42-04	1.77-04	1.03-04	6.55-05	4.41-05	3.11-05	2.27-05	1.71-05	1.32-05	1.04-05	8.34-06	6.79-06
35	3.44-03	1.06-03	4.54-04	2.36-04	1.38-04	8.73-05	5.88-05	4.14-05	3.03-05	2.28-05	1.76-05	1.39-05	1.11-05	9.06-06
30	4.69-03	1.44-03	6.22-04	3.23-04	1.89-04	1.20-04	8.10-05	5.72-05	4.18-05	3.15-05	2.44-05	1.92-05	1.54-05	1.25-05
29	5.03-03	1.55-03	6.69-04	3.48-04	2.04-04	1.29-04	8.73-05	6.16-05	4.51-05	3.40-05	2.63-05	2.07-05	1.66-05	1.35-05
28	5.42-03	1.67-03	7.23-04	3.76-04	2.20-04	1.40-04	9.45-05	6.68-05	4.89-05	3.69-05	2.85-05	2.25-05	1.81-05	1.47-05
27	5.87-03	1.81-03	7.85-04	4.09-04	2.40-04	1.53-04	1.03-04	7.28-05	5.34-05	4.03-05	3.12-05	2.46-05	1.97-05	1.61-05
26	6.38-03	1.97-03	8.56-04	4.47-04	2.62-04	1.67-04	1.13-04	7.99-05	5.86-05	4.43-05	3.43-05	2.70-05	2.17-05	1.77-05
25	6.96-03	2.16-03	9.38-04	4.91-04	2.89-04	1.84-04	1.25-04	8.83-05	6.48-05	4.90-05	3.79-05	2.99-05	2.40-05	1.96-05
24	7.62-03	2.37-03	1.03-03	5.42-04	3.19-04	2.04-04	1.38-04	9.82-05	7.22-05	5.46-05	4.23-05	3.34-05	2.68-05	2.19-05
23	8.36-03	2.61-03	1.14-03	6.01-04	3.55-04	2.28-04	1.55-04	1.10-04	8.09-05	6.13-05	4.75-05	3.76-05	3.02-05	2.46-05
22	9.20-03	2.89-03	1.27-03	6.71-04	3.98-04	2.56-04	1.74-04	1.24-04	9.15-05	6.94-05	5.39-05	4.26-05	3.43-05	2.79-05
21	1.01-02	3.20-03	1.42-03	7.52-04	4.48-04	2.89-04	1.98-04	1.41-04	1.04-04	7.93-05	6.16-05	4.88-05	3.93-05	3.20-05
20	1.12-02	3.56-03	1.59-03	8.50-04	5.09-04	3.30-04	2.26-04	1.62-04	1.20-04	9.15-05	7.13-05	5.65-05	4.55-05	3.70-05
19	1.24-02	3.98-03	1.79-03	9.67-04	5.84-04	3.81-04	2.62-04	1.89-04	1.40-04	1.07-04	8.33-05	6.61-05	5.32-05	4.32-05
18	1.37-02	4.47-03	2.04-03	1.11-03	6.76-04	4.44-04	3.07-04	2.22-04	1.65-04	1.26-04	9.86-05	7.82-05	6.28-05	5.07-05
17	1.53-02	5.06-03	2.34-03	1.29-03	7.93-04	5.24-04	3.65-04	2.64-04	1.98-04	1.51-04	1.18-04	9.35-05	7.46-05	5.93-05
16	1.72-02	5.78-03	2.72-03	1.52-03	9.44-04	6.28-04	4.40-04	3.20-04	2.40-04	1.83-04	1.43-04	1.12-04	8.83-05	6.60-05
15	1.96-02	6.70-03	3.21-03	1.82-03	1.14-03	7.65-04	5.38-04	3.93-04	2.94-04	2.25-04	1.74-04	1.35-04	9.94-05	
14	2.28-02	7.90-03	3.86-03	2.22-03	1.41-03	9.48-04	6.70-04	4.89-04	3.66-04	2.78-04	2.12-04	1.54-04		
13	2.70-02	9.53-03	4.74-03	2.76-03	1.76-03	1.20-03	8.47-04	6.18-04	4.60-04	3.43-04	2.45-04			
12	3.29-02	1.18-02	5.96-03	3.52-03	2.26-03	1.54-03	1.09-03	7.91-04	5.78-04	4.05-04				
11	4.13-02	1.50-02	7.71-03	4.59-03	2.97-03	2.03-03	1.43-03	1.02-03	6.99-04					
10	5.38-02	1.98-02	1.03-02	6.18-03	4.01-03	2.73-03	1.89-03	1.27-03						
9	7.29-02	2.71-02	1.42-02	8.61-03	5.59-03	3.75-03	2.45-03							
8	1.04-01	3.89-02	2.06-02	1.25-02	8.05-03	5.10-03								
7	1.56-01	5.92-02	3.17-02	1.92-02	1.17-02									
6	2.54-01	9.73-02	5.24-02	3.05-02										
5	4.62-01	1.79-01	9.43-02											
4	1.00+00	3.83-01												
3	2.97+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.20-06	2.67-06	2.25-06	1.92-06	1.64-06	1.42-06	1.24-06	1.08-06	9.52-07	8.42-07	7.48-07	6.68-07	5.99-07	5.39-07
45	4.22-06	3.52-06	2.97-06	2.52-06	2.16-06	1.87-06	1.63-06	1.42-06	1.25-06	1.11-06	9.84-07	8.78-07	7.87-07	7.07-07
40	5.60-06	4.67-06	3.94-06	3.35-06	2.87-06	2.48-06	2.16-06	1.89-06	1.66-06	1.47-06	1.30-06	1.16-06	1.04-06	9.34-07
35	7.47-06	6.23-06	5.25-06	4.47-06	3.83-06	3.31-06	2.87-06	2.51-06	2.21-06	1.95-06	1.73-06	1.54-06	1.37-06	1.23-06
30	1.03-05	8.63-06	7.27-06	6.18-06	5.29-06	4.56-06	3.96-06	3.45-06	3.02-06	2.65-06	2.33-06	2.04-06	1.77-06	1.44-06
29	1.12-05	9.31-06	7.84-06	6.67-06	5.71-06	4.92-06	4.26-06	3.71-06	3.24-06	2.84-06	2.48-06	2.13-06	1.74-06	
28	1.21-05	1.01-05	8.52-06	7.23-06	6.19-06	5.33-06	4.62-06	4.01-06	3.49-06	3.03-06	2.60-06	2.11-06		
27	1.33-05	1.11-05	9.30-06	7.90-06	6.76-06	5.81-06	5.02-06	4.35-06	3.76-06	3.21-06	2.59-06			
26	1.46-05	1.22-05	1.02-05	8.68-06	7.42-06	6.37-06	5.48-06	4.71-06	4.01-06	3.22-06				
25	1.62-05	1.35-05	1.13-05	9.61-06	8.19-06	7.01-06	5.99-06	5.07-06	4.06-06					
24	1.80-05	1.50-05	1.26-05	1.07-05	9.09-06	7.73-06	6.50-06	5.18-06						
23	2.03-05	1.69-05	1.42-05	1.20-05	1.01-05	8.45-06	6.70-06							
22	2.30-05	1.92-05	1.60-05	1.34-05	1.12-05	8.80-06								
21	2.64-05	2.19-05	1.82-05	1.50-05	1.18-05									
20	3.04-05	2.51-05	2.05-05	1.60-05										
19	3.53-05	2.86-05	2.21-05											
18	4.08-05	3.12-05												
17	4.49-05													

H TE = 5.00+03 NE = 1.00+05 CASE B NC = 58

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.92-38	-1.14-36	-4.02-36	-1.02-35	-2.16-35	-4.13-35	-7.32-35	-1.23-34	-1.97-34	-3.08-34	-4.69-34	-7.02-34	-1.03-33
45	0.00+00	5.44-39	-1.44-36	-5.13-36	-1.30-35	-2.77-35	-5.30-35	-9.40-35	-1.58-34	-2.55-34	-4.01-34	-6.16-34	-9.30-34	-1.39-33
40	0.00+00	8.35-38	-1.73-36	-6.35-36	-1.61-35	-3.44-35	-6.57-35	-1.16-34	-1.96-34	-3.17-34	-5.01-34	-7.77-34	-1.19-33	-1.81-33
35	0.00+00	2.94-37	-1.88-36	-7.30-36	-1.87-35	-3.95-35	-7.46-35	-1.31-34	-2.18-34	-3.51-34	-5.54-34	-8.67-34	-1.35-33	-2.10-33
30	0.00+00	7.81-37	-1.67-36	-7.58-36	-1.95-35	-4.03-35	-7.32-35	-1.22-34	-1.94-34	-2.97-34	-4.50-34	-6.87-34	-1.07-33	-1.73-33
29	0.00+00	9.29-37	-1.59-36	-7.57-36	-1.95-35	-4.00-35	-7.18-35	-1.18-34	-1.82-34	-2.71-34	-4.00-34	-5.96-34	-9.20-34	-1.49-33
28	0.00+00	1.10-36	-1.48-36	-7.56-36	-1.95-35	-3.97-35	-7.00-35	-1.12-34	-1.68-34	-2.40-34	-3.36-34	-4.79-34	-7.17-34	-1.16-33
27	0.00+00	1.30-36	-1.35-36	-7.53-36	-1.96-35	-3.93-35	-6.80-35	-1.05-34	-1.50-34	-2.01-34	-2.57-34	-3.28-34	-4.47-34	-7.00-34
26	0.00+00	1.54-36	-1.19-36	-7.47-36	-1.95-35	-3.88-35	-6.54-35	-9.71-35	-1.29-34	-1.52-34	-1.55-34	-1.29-34	-7.94-35	-5.24-35
25	0.00+00	1.83-36	-9.68-37	-7.33-36	-1.93-35	-3.79-35	-6.19-35	-8.64-35	-1.01-34	-8.80-35	-1.94-35	1.41-34	4.36-34	8.94-34
24	0.00+00	2.18-36	-6.72-37	-7.06-36	-1.89-35	-3.64-35	-5.68-35	-7.18-35	-6.42-35	-2.81-36	1.64-34	5.18-34	1.18-33	2.33-33
23	0.00+00	2.60-36	-2.59-37	-6.57-36	-1.80-35	-3.39-35	-4.94-35	-5.16-35	-1.38-35	1.14-34	4.21-34	1.06-33	2.30-33	4.59-33
22	0.00+00	3.14-36	3.22-37	-5.75-36	-1.64-35	-2.99-35	-3.85-35	-2.31-35	5.62-35	2.77-34	7.87-34	1.86-33	4.02-33	8.31-33
21	0.00+00	3.81-36	1.14-36	-4.44-36	-1.38-35	-2.35-35	-2.24-35	1.73-35	1.54-34	5.08-34	1.32-33	3.07-33	6.78-33	1.48-32
20	0.00+00	4.67-36	2.28-36	-2.42-36	-9.58-36	-1.39-35	9.19-37	7.43-35	2.93-34	8.39-34	2.11-33	4.96-33	1.14-32	2.67-32
19	0.00+00	5.76-36	3.87-36	5.67-37	-3.31-36	2.15-37	3.42-35	1.54-34	4.88-34	1.32-33	3.31-33	8.04-33	1.98-32	5.15-32
18	0.00+00	7.17-36	6.06-36	4.08-36	5.86-36	2.05-35	8.11-35	2.67-34	7.66-34	2.03-33	5.19-33	1.33-32	3.62-32	1.12-31
17	0.00+00	8.98-36	9.02-36	1.10-35	1.89-35	4.93-35	1.47-34	4.25-34	1.17-33	3.11-33	8.32-33	2.34-32	7.45-32	3.13-31
16	0.00+00	1.13-35	1.30-35	1.94-35	3.73-35	8.98-35	2.39-34	6.50-34	1.76-33	4.83-33	1.40-32	4.55-32	1.94-31	1.69-30
15	0.00+00	1.44-35	1.83-35	3.10-35	6.31-35	1.47-34	3.72-34	9.81-34	2.69-33	7.82-33	2.57-32	1.10-31	9.33-31	
14	0.00+00	1.84-35	2.54-35	4.71-35	9.99-35	2.31-34	5.70-34	1.50-33	4.25-33	1.37-32	5.68-32	4.54-31		
13	0.00+00	2.38-35	3.52-35	7.00-35	1.54-34	3.60-34	8.89-34	2.38-33	7.23-33	2.78-32	1.90-31			
12	0.00+00	3.12-35	4.91-35	1.04-34	2.40-34	5.77-34	1.47-33	4.11-33	1.38-32	6.51-32				
11	0.00+00	4.21-35	6.99-35	1.59-34	3.90-34	9.98-34	2.71-33	8.20-33	2.02-32					
10	0.00+00	5.86-35	1.03-34	2.56-34	6.94-34	1.99-33	6.18-33	1.26-32						
9	0.00+00	8.57-35	1.64-34	4.55-34	1.45-33	5.19-33	1.84-32							
8	0.00+00	1.34-34	2.86-34	9.59-34	4.09-33	2.40-32								
7	0.00+00	2.31-34	5.87-34	2.76-33	2.35-32									
6	0.00+00	4.64-34	1.63-33	1.72-32										
5	0.00+00	1.23-33	9.69-33											
4	0.00+00	6.39-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.51-33	-2.17-33	-3.08-33	-4.33-33	-6.02-33	-8.29-33	-1.13-32	-1.53-32	-2.06-32	-2.74-32	-3.63-32	-4.78-32	-6.26-32	-8.15-32
45	-2.05-33	-3.00-33	-4.34-33	-6.22-33	-8.84-33	-1.25-32	-1.74-32	-2.42-32	-3.35-32	-4.61-32	-6.33-32	-8.67-32	-1.18-31	-1.61-31
40	-2.73-33	-4.09-33	-6.08-33	-9.00-33	-1.32-32	-1.93-32	-2.81-32	-4.09-32	-5.93-32	-8.62-32	-1.25-31	-1.84-31	-2.70-31	-4.01-31
35	-3.28-33	-5.12-33	-8.00-33	-1.25-32	-1.95-32	-3.04-32	-4.75-32	-7.47-32	-1.19-31	-1.91-31	-3.14-31	-5.30-31	-9.24-31	-1.69-30
30	-2.87-33	-4.89-33	-8.47-33	-1.49-32	-2.64-32	-4.76-32	-8.77-32	-1.67-31	-3.32-31	-7.09-31	-1.69-30	-4.78-30	-1.88-29	-1.62-28
29	-2.52-33	-4.45-33	-8.03-33	-1.48-32	-2.76-32	-5.24-32	-1.02-31	-2.09-31	-4.57-31	-1.11-30	-3.22-30	-1.29-29	-1.14-28	
28	-2.02-33	-3.75-33	-7.20-33	-1.41-32	-2.82-32	-5.77-32	-1.22-31	-2.76-31	-6.90-31	-2.05-30	-8.38-30	-7.57-29		
27	-1.29-33	-2.65-33	-5.73-33	-1.26-32	-2.79-32	-6.33-32	-1.51-31	-3.94-31	-1.21-30	-5.12-30	-4.75-29			
26	-1.98-34	-9.02-34	-3.11-33	-9.12-33	-2.49-32	-6.75-32	-1.93-31	-6.36-31	-2.83-30	-2.75-29				
25	1.49-33	2.00-33	1.73-33	-1.54-33	-1.47-32	-6.27-32	-2.54-31	-1.29-30	-1.37-29					
24	4.20-33	7.06-33	1.11-32	1.59-32	1.70-32	-1.31-32	-2.93-31	-4.63-30						
23	8.77-33	1.64-32	3.09-32	6.02-32	1.27-31	3.13-31	1.05-30							
22	1.69-32	3.52-32	7.74-32	1.93-31	6.33-31	4.26-30								
21	3.27-32	7.71-32	2.08-31	7.47-31	5.66-30									
20	6.65-32	1.89-31	7.19-31	5.77-30										
19	1.53-31	6.06-31	5.06-30											
18	4.58-31	3.93-30												
17	2.73-30													

H TE = 5.00+03 NE = 1.00+06 CASE B NC = 37

TOTAL RC = 4.669-13 4-2 RC = 5.598-14 4-2 EM = 2.288-25 2S RC = 1.416-13 2P RC = 3.254-13

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.54-03	4.71-04	2.03-04	1.05-04	6.12-05	3.88-05	2.61-05	1.84-05	1.34-05	1.01-05	7.81-06	6.15-06	4.93-06	4.02-06
45	2.09-03	6.42-04	2.76-04	1.43-04	8.34-05	5.28-05	3.55-05	2.50-05	1.83-05	1.38-05	1.06-05	8.38-06	6.71-06	5.46-06
40	2.93-03	9.00-04	3.87-04	2.00-04	1.17-04	7.40-05	4.98-05	3.51-05	2.56-05	1.93-05	1.49-05	1.17-05	9.40-06	7.65-06
35	4.21-03	1.29-03	5.55-04	2.87-04	1.68-04	1.06-04	7.14-05	5.03-05	3.68-05	2.77-05	2.14-05	1.68-05	1.35-05	1.10-05
30	6.13-03	1.88-03	8.09-04	4.19-04	2.44-04	1.55-04	1.04-04	7.34-05	5.36-05	4.04-05	3.11-05	2.45-05	1.96-05	1.60-05
29	6.61-03	2.03-03	8.72-04	4.52-04	2.64-04	1.67-04	1.12-04	7.91-05	5.78-05	4.35-05	3.36-05	2.64-05	2.12-05	1.72-05
28	7.12-03	2.19-03	9.40-04	4.87-04	2.84-04	1.80-04	1.21-04	8.53-05	6.24-05	4.69-05	3.62-05	2.85-05	2.28-05	1.85-05
27	7.67-03	2.36-03	1.01-03	5.25-04	3.06-04	1.94-04	1.31-04	9.20-05	6.72-05	5.06-05	3.90-05	3.07-05	2.46-05	2.00-05
26	8.27-03	2.54-03	1.09-03	5.66-04	3.30-04	2.09-04	1.41-04	9.92-05	7.25-05	5.46-05	4.21-05	3.31-05	2.65-05	2.15-05
25	8.92-03	2.74-03	1.18-03	6.11-04	3.56-04	2.26-04	1.52-04	1.07-04	7.83-05	5.89-05	4.54-05	3.57-05	2.86-05	2.32-05
24	9.64-03	2.96-03	1.27-03	6.61-04	3.86-04	2.45-04	1.65-04	1.16-04	8.48-05	6.38-05	4.92-05	3.87-05	3.10-05	2.51-05
23	1.05-02	3.21-03	1.38-03	7.18-04	4.19-04	2.66-04	1.79-04	1.26-04	9.22-05	6.94-05	5.35-05	4.21-05	3.37-05	2.73-05
22	1.14-02	3.51-03	1.51-03	7.85-04	4.59-04	2.91-04	1.96-04	1.38-04	1.01-04	7.60-05	5.86-05	4.61-05	3.68-05	2.99-05
21	1.25-02	3.86-03	1.66-03	8.65-04	5.06-04	3.21-04	2.16-04	1.53-04	1.12-04	8.40-05	6.47-05	5.09-05	4.07-05	3.29-05
20	1.39-02	4.28-03	1.85-03	9.62-04	5.63-04	3.58-04	2.41-04	1.70-04	1.25-04	9.37-05	7.22-05	5.68-05	4.53-05	3.67-05
19	1.55-02	4.79-03	2.07-03	1.08-03	6.34-04	4.03-04	2.72-04	1.92-04	1.41-04	1.06-04	8.16-05	6.41-05	5.11-05	4.12-05
18	1.75-02	5.41-03	2.35-03	1.23-03	7.21-04	4.60-04	3.11-04	2.20-04	1.61-04	1.21-04	9.33-05	7.32-05	5.82-05	4.66-05
17	1.98-02	6.16-03	2.69-03	1.41-03	8.30-04	5.30-04	3.59-04	2.54-04	1.86-04	1.40-04	1.08-04	8.46-05	6.69-05	5.28-05
16	2.26-02	7.07-03	3.10-03	1.63-03	9.68-04	6.20-04	4.21-04	2.99-04	2.19-04	1.65-04	1.27-04	9.89-05	7.70-05	5.73-05
15	2.59-02	8.18-03	3.62-03	1.92-03	1.14-03	7.37-04	5.02-04	3.57-04	2.62-04	1.98-04	1.51-04	1.16-04	8.54-05	
14	2.99-02	9.55-03	4.27-03	2.29-03	1.38-03	8.91-04	6.10-04	4.35-04	3.20-04	2.40-04	1.81-04	1.32-04		
13	3.48-02	1.13-02	5.13-03	2.79-03	1.69-03	1.10-03	7.59-04	5.43-04	3.98-04	2.95-04	2.10-04			
12	4.10-02	1.35-02	6.28-03	3.47-03	2.13-03	1.40-03	9.68-04	6.91-04	5.01-04	3.51-04				
11	4.94-02	1.67-02	7.91-03	4.44-03	2.76-03	1.83-03	1.26-03	8.93-04	6.11-04					
10	6.14-02	2.12-02	1.03-02	5.90-03	3.70-03	2.46-03	1.68-03	1.12-03						
9	7.98-02	2.81-02	1.40-02	8.15-03	5.14-03	3.39-03	2.18-03							
8	1.09-01	3.94-02	2.01-02	1.18-02	7.39-03	4.60-03								
7	1.61-01	5.90-02	3.05-02	1.79-02	1.06-02									
6	2.58-01	9.61-02	5.00-02	2.80-02										
5	4.65-01	1.74-01	8.80-02											
4	1.00+00	3.66-01												
3	2.92+00													

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.31-06	2.76-06	2.33-06	1.98-06	1.70-06	1.47-06	1.28-06	1.12-06	9.84-07	8.70-07	7.73-07	6.90-07	6.19-07	5.57-07
45	4.51-06	3.76-06	3.17-06	2.69-06	2.31-06	2.00-06	1.74-06	1.52-06	1.34-06	1.18-06	1.05-06	9.37-07	8.39-07	7.54-07
40	6.30-06	5.26-06	4.43-06	3.77-06	3.23-06	2.79-06	2.42-06	2.12-06	1.86-06	1.65-06	1.46-06	1.30-06	1.17-06	1.05-06
35	9.03-06	7.53-06	6.34-06	5.39-06	4.62-06	3.99-06	3.46-06	3.03-06	2.66-06	2.34-06	2.08-06	1.85-06	1.65-06	1.47-06
30	1.31-05	1.10-05	9.22-06	7.82-06	6.69-06	5.77-06	5.00-06	4.35-06	3.81-06	3.34-06	2.93-06	2.57-06	2.22-06	1.81-06
29	1.42-05	1.18-05	9.93-06	8.43-06	7.20-06	6.20-06	5.37-06	4.67-06	4.08-06	3.56-06	3.10-06	2.67-06	2.17-06	
28	1.53-05	1.27-05	1.07-05	9.07-06	7.75-06	6.66-06	5.76-06	5.00-06	4.35-06	3.77-06	3.23-06	2.62-06		
27	1.64-05	1.37-05	1.15-05	9.75-06	8.33-06	7.15-06	6.17-06	5.33-06	4.60-06	3.93-06	3.17-06			
26	1.77-05	1.47-05	1.24-05	1.05-05	8.94-06	7.66-06	6.59-06	5.65-06	4.80-06	3.85-06				
25	1.91-05	1.59-05	1.33-05	1.13-05	9.60-06	8.19-06	6.99-06	5.90-06	4.72-06					
24	2.07-05	1.72-05	1.44-05	1.21-05	1.03-05	8.73-06	7.32-06	5.82-06						
23	2.24-05	1.86-05	1.56-05	1.31-05	1.10-05	9.19-06	7.26-06							
22	2.45-05	2.03-05	1.69-05	1.41-05	1.17-05	9.18-06								
21	2.70-05	2.23-05	1.84-05	1.51-05	1.18-05									
20	2.99-05	2.45-05	2.00-05	1.54-05										
19	3.34-05	2.69-05	2.07-05											
18	3.72-05	2.83-05												
17	3.97-05													

H TE = 5.00+03 NE = 1.00+06 CASE B NC = 37

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-4.00-38	-1.28-36	-4.51-36	-1.15-35	-2.49-35	-4.85-35	-8.77-35	-1.50-34	-2.47-34	-3.92-34	-6.04-34	-9.06-34	-1.33-33
45	0.00+00	-4.96-38	-1.74-36	-6.16-36	-1.58-35	-3.44-35	-6.72-35	-1.22-34	-2.11-34	-3.49-34	-5.59-34	-8.72-34	-1.32-33	-1.97-33
40	0.00+00	-5.32-38	-2.42-36	-8.63-36	-2.23-35	-4.87-35	-9.60-35	-1.76-34	-3.06-34	-5.13-34	-8.34-34	-1.32-33	-2.04-33	-3.08-33
35	0.00+00	-1.15-38	-3.35-36	-1.22-35	-3.16-35	-6.98-35	-1.39-34	-2.57-34	-4.55-34	-7.75-34	-1.28-33	-2.08-33	-3.30-33	-5.14-33
30	0.00+00	2.03-37	-4.43-36	-1.67-35	-4.40-35	-9.80-35	-1.97-34	-3.72-34	-6.70-34	-1.17-33	-2.01-33	-3.37-33	-5.60-33	-9.18-33
29	0.00+00	2.98-37	-4.61-36	-1.76-35	-4.65-35	-1.04-34	-2.09-34	-3.96-34	-7.18-34	-1.26-33	-2.18-33	-3.71-33	-6.23-33	-1.04-32
28	0.00+00	4.22-37	-4.75-36	-1.84-35	-4.89-35	-1.09-34	-2.21-34	-4.19-34	-7.64-34	-1.36-33	-2.36-33	-4.06-33	-6.93-33	-1.17-32
27	0.00+00	5.83-37	-4.83-36	-1.91-35	-5.10-35	-1.14-34	-2.31-34	-4.41-34	-8.07-34	-1.44-33	-2.54-33	-4.44-33	-7.69-33	-1.33-32
26	0.00+00	7.89-37	-4.85-36	-1.97-35	-5.28-35	-1.18-34	-2.40-34	-4.59-34	-8.45-34	-1.52-33	-2.72-33	-4.82-33	-8.51-33	-1.50-32
25	0.00+00	1.05-36	-4.78-36	-2.01-35	-5.41-35	-1.22-34	-2.47-34	-4.73-34	-8.75-34	-1.59-33	-2.88-33	-5.21-33	-9.40-33	-1.71-32
24	0.00+00	1.37-36	-4.62-36	-2.03-35	-5.50-35	-1.24-34	-2.51-34	-4.82-34	-8.96-34	-1.65-33	-3.03-33	-5.59-33	-1.04-32	-1.95-32
23	0.00+00	1.77-36	-4.37-36	-2.03-35	-5.56-35	-1.25-34	-2.53-34	-4.85-34	-9.07-34	-1.69-33	-3.16-33	-5.97-33	-1.14-32	-2.24-32
22	0.00+00	2.26-36	-4.03 36	-2.02-35	-5.58-35	-1.25-34	-2.53-34	-4.84-34	-9.07-34	-1.71-33	-3.26-33	-6.35-33	-1.27-32	-2.61-32
21	0.00+00	2.86-36	-3.59-36	-2.01-35	-5.59-35	-1.25-34	-2.51-34	-4.77-34	-8.95-34	-1.70-33	-3.33-33	-6.74-33	-1.42-32	-3.13-32
20	0.00+00	3.60-36	-3.02-36	-1.98-35	-5.59-35	-1.24-34	-2.47-34	-4.64-34	-8.67-34	-1.66-33	-3.34-33	-7.12-33	-1.61-32	-3.89-32
19	0.00+00	4.52-36	-2.27-36	-1.93-35	-5.56-35	-1.23-34	-2.40-34	-4.41-34	-8.10-34	-1.56-33	-3.23-33	-7.36-33	-1.83-32	-5.11-32
18	0.00+00	5.70-36	-1.22-36	-1.84-35	-5.44-35	-1.19-34	-2.26-34	-3.98-34	-6.96-34	-1.31-33	-2.80-33	-7.02-33	-2.05-32	-7.20-32
17	0.00+00	7.25-36	3.25-37	-1.66-35	-5.15-35	-1.11-34	-1.98-34	-3.13-34	-4.62-34	-7.23-34	-1.48-33	-4.52-33	-1.88-32	-1.08-31
16	0.00+00	9.32-36	2.68-36	-1.33-35	-4.50-35	-9.29-35	-1.43-34	-1.45-34	2.69-35	6.57-34	2.38-33	6.60-33	1.53-32	-3.70-32
15	0.00+00	1.22-35	6.33-36	-7.15-36	-3.19-35	-5.77-35	-3.57-35	1.89-34	1.09-33	4.13-33	1.49-32	6.37-32	5.24-31	
14	0.00+00	1.61-35	1.21-35	3.70-36	-7.12-36	9.46-36	1.70-34	8.73-34	3.54-33	1.41-32	6.79-32	6.44-31		
13	0.00+00	2.18-35	2.10-35	2.24-35	3.79-35	1.35-34	5.74-34	2.36-33	1.00-32	5.19-32	5.28-31			
12	0.00+00	2.99-35	3.51-35	5.42-35	1.19-34	3.73-34	1.41-33	6.00-33	3.23-32	3.39-31				
11	0.00+00	4.18-35	5.72-35	1.08-34	2.68-34	8.50-34	3.35-33	1.75-32	1.79-31					
10	0.00+00	5.99-35	9.30-35	2.05-34	5.63-34	1.94-33	9.16-33	8.31-32						
9	0.00+00	8.86-35	1.55-34	3.94-34	1.25-33	5.25-33	3.92-32							
8	0.00+00	1.39-34	2.75-34	8.42-34	3.47-33	2.37-32								
7	0.00+00	2.37-34	5.60-34	2.37-33	1.85-32									
6	0.00+00	4.73-34	1.53-33	1.39-32										
5	0.00+00	1.24-33	8.69-33											
4	0.00+00	6.38-33												
3	0.00+00													

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.91-33	-2.68-33	-3.70-33	-5.01-33	-6.67-33	-8.73-33	-1.12-32	-1.41-32	-1.75-32	-2.14-32	-2.57-32	-3.07-32	-3.63-32	-4.27-32
45	-2.86-33	-4.09-33	-5.73-33	-7.92-33	-1.08-32	-1.44-32	-1.89-32	-2.45-32	-3.13-32	-3.94-32	-4.91-32	-6.07-32	-7.49-32	-9.23-32
40	-4.58-33	-6.70-33	-9.65-33	-1.37-32	-1.92-32	-2.66-32	-3.63-32	-4.90-32	-6.54-32	-8.66-32	-1.14-31	-1.51-31	-2.00-31	-2.68-31
35	-7.90-33	-1.20-32	-1.80-32	-2.67-32	-3.95-32	-5.79-32	-8.44-32	-1.23-31	-1.78-31	-2.60-31	-3.84-31	-5.80-31	-9.06-31	-1.49-30
30	-1.49-32	-2.42-32	-3.91-32	-6.35-32	-1.04-31	-1.71-31	-2.86-31	-4.92-31	-8.80-31	-1.68-30	-3.53-30	-8.80-30	-3.03-29	-2.30-28
29	-1.72-32	-2.83-32	-4.69-32	-7.82-32	-1.32-31	-2.26-31	-3.98-31	-7.29-31	-1.42-30	-3.05-30	-7.75-30	-2.71-29	-2.08-28	
28	-1.98-32	-3.34-32	-5.68-32	-9.79-32	-1.72-31	-3.10-31	-5.81-31	-1.16-30	-2.55-30	-6.61-30	-2.36-29	-1.84-28		
27	-2.29-32	-3.98-32	-6.99-32	-1.25-31	-2.31-31	-4.44-31	-9.08-31	-2.05-30	-5.44-30	-1.98-29	-1.58-28			
26	-2.67-32	-4.78-32	-8.75-32	-1.65-31	-3.24-31	-6.80-31	-1.57-30	-4.29-30	-1.60-29	-1.31-28				
25	-3.13-32	-5.84-32	-1.12-31	-2.26-31	-4.85-31	-1.15-30	-3.22-30	-1.24-29	-1.03-28					
24	-3.71-32	-7.29-32	-1.50-31	-3.28-31	-7.97-31	-2.29-30	-9.03-30	-7.77-29						
23	-4.49-32	-9.42-32	-2.11-31	-5.24-31	-1.54-30	-6.24-30	-5.52-29							
22	-5.60-32	-1.28-31	-3.25-31	-9.79-31	-4.06-30	-3.69-29								
21	-7.34-32	-1.91-31	-5.87-31	-2.49-30	-2.32-29									
20	-1.04-31	-3.29-31	-1.43-30	-1.37-29										
19	-1.68-31	-7.58-31	-7.48-30											
18	-3.45-31	-3.59-30												
17	-1.29-30													

H TE = 5.00+03 NE = 1.00+07 CASE B NC = 23

TOTA. RC = 4.813-13 4-2 RC = 5.778-14 4-2 EM = 2.361-25 2S RC = 1.481-13 2P RC = 3.331-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.50-03	4.62-04	1.98-04	1.03-04	5.99-05	3.80-05	2.55-05	1.80-05	1.32-05	9.91-06	7.65-06	6.03-06	4.83-06	3.93-06
45	2.07-03	6.34-04	2.72-04	1.41-04	8.23-05	5.21-05	3.51-05	2.47-05	1.81-05	1.36-05	1.05-05	8.27-06	6.63-06	5.39-06
40	2.94-03	9.02-04	3.88-04	2.01-04	1.17-04	7.42-05	4.99-05	3.52-05	2.57-05	1.93-05	1.49-05	1.18-05	9.42-06	7.67-06
35	4.38-03	1.34-03	5.77-04	2.99-04	1.74-04	1.10-04	7.42-05	5.23-05	3.82-05	2.87-05	2.22-05	1.75-05	1.40-05	1.14-05
30	6.85-03	2.10-03	9.03-04	4.67-04	2.73-04	1.73-04	1.16-04	8.17-05	5.97-05	4.49-05	3.46-05	2.72-05	2.18-05	1.77-05
29	7.54-03	2.31-03	9.94-04	5.14-04	3.00-04	1.90-04	1.28-04	8.99-05	6.57-05	4.94-05	3.81-05	3.00-05	2.40-05	1.95-05
28	8.32-03	2.55-03	1.10-03	5.67-04	3.31-04	2.09-04	1.41-04	9.91-05	7.24-05	5.44-05	4.20-05	3.30-05	2.64-05	2.15-05
27	9.19-03	2.82-03	1.21-03	6.27-04	3.65-04	2.31-04	1.55-04	1.09-04	7.99-05	6.01-05	4.63-05	3.54-05	2.91-05	2.37-05
26	1.02-02	3.12-03	1.34-03	6.93-04	4.04-04	2.56-04	1.72-04	1.21-04	8.83-05	6.64-05	5.12-05	4.02-05	3.22-05	2.61-05
25	1.13-02	3.45-03	1.48-03	7.67-04	4.47-04	2.83-04	1.90-04	1.34-04	9.77-05	7.35-05	5.66-05	4.45-05	3.56-05	2.89-05
24	1.25-02	3.83-03	1.64-03	8.50-04	4.95-04	3.13-04	2.11-04	1.48-04	1.08-04	8.13-05	6.26-05	4.92-05	3.93-05	3.19-05
23	1.37-02	4.21-03	1.81-03	9.36-04	5.46-04	3.45-04	2.32-04	1.63-04	1.19-04	8.96-05	6.90-05	5.42-05	4.33-05	3.51-05
22	1.52-02	4.66-03	2.00-03	1.04-03	6.03-04	3.82-04	2.57-04	1.81-04	1.32-04	9.90-05	7.62-05	5.98-05	4.78-05	3.87-05
21	1.68-02	5.14-03	2.21-03	1.14-03	6.66-04	4.22-04	2.83-04	1.99-04	1.45-04	1.09-04	8.40-05	6.59-05	5.26-05	4.25-05
20	1.85-02	5.66-03	2.43-03	1.26-03	7.34-04	4.65-04	3.12-04	2.20-04	1.60-04	1.20-04	9.24-05	7.25-05	5.77-05	4.66-05
19	2.03-02	6.24-03	2.68-03	1.39-03	8.09-04	5.12-04	3.44-04	2.42-04	1.76-04	1.32-04	1.02-04	7.95-05	6.32-05	5.08-05
18	2.24-02	6.87-03	2.95-03	1.53-03	8.92-04	5.64-04	3.79-04	2.67-04	1.94-04	1.46-04	1.12-04	8.73-05	6.92-05	5.52-05
17	2.48-02	7.62-03	3.28-03	1.70-03	9.90-04	6.26-04	4.21-04	2.96-04	2.15-04	1.61-04	1.23-04	9.61-05	7.56-05	5.94-05
16	2.78-02	8.53-03	3.67-03	1.90-03	1.11-03	7.03-04	4.72-04	3.32-04	2.41-04	1.80-04	1.38-04	1.06-04	8.24-05	6.09-05
15	3.15-02	9.71-03	4.18-03	2.17-03	1.27-03	8.02-04	5.38-04	3.78-04	2.75-04	2.05-04	1.55-04	1.18-04	8.61-05	
14	3.65-02	1.12-02	4.85-03	2.52-03	1.47-03	9.33-04	6.27-04	4.40-04	3.19-04	2.36-04	1.76-04	1.26-04		
13	4.28-02	1.32-02	5.74-03	2.99-03	1.75-03	1.11-03	7.46-04	5.23-04	3.77-04	2.75-04	1.94-04			
12	5.11-02	1.59-02	6.93-03	3.63-03	2.13-03	1.35-03	9.10-04	6.35-04	4.52-04	3.11-04				
11	6.20-02	1.94-02	8.54-03	4.51-03	2.66-03	1.70-03	1.14-03	7.86-04	5.29-04					
10	7.64-02	2.43-02	1.08-02	5.78-03	3.44-03	2.20-03	1.46-03	9.59-04						
9	9.64-02	3.12-02	1.42-02	7.71-03	4.63-03	2.95-03	1.87-03							
8	1.27-01	4.20-02	1.96-02	1.08-02	6.53-03	3.97-03								
7	1.77-01	6.02-02	2.90-02	1.62-02	9.33-03									
6	2.72-01	9.47-02	4.65-02	2.50-02										
5	4.74-01	1.68-01	8.02-02											
4	1.00+00	3.42-01												
3	2.85+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.24-06	2.71-06	2.28-06	1.94-06	1.66-06	1.44-06	1.25-06	1.09-06	9.63-07	8.52-07	7.57-07	6.76-07	6.06-07	5.45-07
45	4.45-06	3.71-06	3.13-06	2.66-06	2.28-06	1.97-06	1.71-06	1.50-06	1.32-06	1.17-06	1.04-06	9.24-07	8.28-07	7.44-07
40	6.32-06	5.27-06	4.44-06	3.78-06	3.24-06	2.79-06	2.43-06	2.12-06	1.87-06	1.65-06	1.47-06	1.31-06	1.17-06	1.05-06
35	9.37-06	7.81-06	6.58-06	5.59-06	4.79-06	4.13-06	3.59-06	3.14-06	2.75-06	2.43-06	2.15-06	1.92-06	1.71-06	1.53-06
30	1.46-05	1.22-05	1.02-05	8.68-06	7.43-06	6.40-06	5.54-06	4.83-06	4.22-06	3.70-06	3.25-06	2.84-06	2.45-06	2.00-06
29	1.60-05	1.34-05	1.12-05	9.53-06	8.15-06	7.01-06	6.07-06	5.28-06	4.60-06	4.02-06	3.50-06	3.01-06	2.44-06	
28	1.77-05	1.47-05	1.24-05	1.05-05	8.95-06	7.69-06	6.65-06	5.77-06	5.01-06	4.34-06	3.72-06	3.01-06		
27	1.95-05	1.62-05	1.36-05	1.15-05	9.84-06	8.44-06	7.28-06	6.29-06	5.42-06	4.62-06	3.72-06			
26	2.15-05	1.79-05	1.50-05	1.27-05	1.08-05	9.26-06	7.95-06	6.82-06	5.78-06	4.63-06				
25	2.37-05	1.97-05	1.65-05	1.40-05	1.19-05	1.01-05	8.63-06	7.27-06	5.80-06					
24	2.62-05	2.17-05	1.82-05	1.53-05	1.30-05	1.10-05	9.20-06	7.30-06						
23	2.88-05	2.39-05	2.00-05	1.68-05	1.41-05	1.17-05	9.25-06							
22	3.17-05	2.62-05	2.18-05	1.82-05	1.50-05	1.18-05								
21	3.48-05	2.86-05	2.37-05	1.94-05	1.51-05									
20	3.79-05	3.10-05	2.52-05	1.95-05										
19	4.11-05	3.31-05	2.53-05											
18	4.39-05	3.32-05												
17	4.45-05													

H TE = 5.00+03 NE = 1.00+07 CASE B NC = 23

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-3.05-38	-1.31-36	-4.69-36	-1.21-35	-2.66-35	-5.21-35	-9.45-35	-1.61-34	-2.62-34	-4.08-34	-6.11-34	-8.81-34	-1.22-33
45	0.00+00	-4.32-38	-1.81-36	-6.50-36	-1.69-35	-3.72-35	-7.33-35	-1.34-34	-2.30-34	-3.78-34	-5.93-34	-8.98-34	-1.31-33	-1.85-33
40	0.00+00	-6.25-38	-2.60-36	-9.38-36	-2.45-35	-5.43-35	-1.08-34	-1.99-34	-3.46-34	-5.75-34	-9.16-34	-1.41-33	-2.09-33	-3.00-33
35	0.00+00	-8.96-38	-3.91-36	-1.42-35	-3.74-35	-8.37-35	-1.68-34	-3.15-34	-5.57-34	-9.41-34	-1.53-33	-2.41-33	-3.68-33	-5.45-33
30	0.00+00	-1.07-37	-6.14-36	-2.26-35	-6.05-35	-1.37-34	-2.81-34	-5.38-34	-9.77-34	-1.70-33	-2.87-33	-4.69-33	-7.49-33	-1.17-32
29	0.00+00	-1.01-37	-6.76-36	-2.50-35	-6.70-35	-1.53-34	-3.15-34	-6.05-34	-1.11-33	-1.94-33	-3.30-33	-5.47-33	-8.84-33	-1.40-32
28	0.00+00	-8.81-38	-7.43-36	-2.76-35	-7.44-35	-1.70-34	-3.53-34	-6.83-34	-1.26-33	-2.23-33	-3.83-33	-6.43-33	-1.05-32	-1.69-32
27	0.00+00	-6.31-38	-8.18-36	-3.06-35	-8.27-35	-1.90-34	-3.97-34	-7.73-34	-1.44-33	-2.58-33	-4.48-33	-7.62-33	-1.27-32	-2.08-32
26	0.00+00	-1.98-38	-8.99-36	-3.39-35	-9.20-35	-2.13-34	-4.47-34	-8.78-34	-1.65-33	-2.99-33	-5.27-33	-9.11-33	-1.55-32	-2.60-32
25	0.00+00	5.06-38	-9.85-36	-3.74-35	-1.02-34	-2.38-34	-5.04-34	-1.00-33	-1.90-33	-3.49-33	-6.26-33	-1.10-32	-1.92-32	-3.30-32
24	0.00+00	1.62-37	-1.08-35	-4.13-35	-1.14-34	-2.67-34	-5.68-34	-1.14-33	-2.19-33	-4.09-33	-7.48-33	-1.35-32	-2.41-32	-4.28-32
23	0.00+00	3.75-37	-1.15-35	-4.48-35	-1.24-34	-2.94-34	-6.33-34	-1.29-33	-2.51-33	-4.78-33	-8.92-33	-1.65-32	-3.05-32	-5.65-32
22	0.00+00	6.48-37	-1.23-35	-4.88-35	-1.37-34	-3.26-34	-7.10-34	-1.46-33	-2.91-33	-5.64-33	-1.08-32	-2.07-32	-3.98-32	-7.76-32
21	0.00+00	1.05-36	-1.29-35	-5.26-35	-1.49-34	-3.59-34	-7.91-34	-1.65-33	-3.36-33	-6.69-33	-1.32-32	-2.63-32	-5.33-32	-1.11-31
20	0.00+00	1.63-36	-1.33-35	-5.59-35	-1.60-34	-3.91-34	-8.74-34	-1.86-33	-3.87-33	-7.95-33	-1.64-32	-3.42-32	-7.38-32	-1.68-31
19	0.00+00	2.45-36	-1.32-35	-5.85-35	-1.70-34	-4.21-34	-9.55-34	-2.08-33	-4.45-33	-9.50-33	-2.05-32	-4.58-32	-1.08-31	-2.78-31
18	0.00+00	3.58-36	-1.27-35	-6.01-35	-1.78-34	-4.47-34	-1.03-33	-2.31-33	-5.11-33	-1.14-32	-2.63-32	-6.40-32	-1.71-31	-5.34-31
17	0.00+00	5.10-36	-1.17-35	-6.07-35	-1.85-34	-4.70-34	-1.11-33	-2.55-33	-5.91-33	-1.40-32	-3.51-32	-9.66-32	-3.12-31	-1.38-30
16	0.00+00	7.10-36	-1.01-35	-6.07-35	-1.90-34	-4.92-34	-1.19-33	-2.84-33	-6.96-33	-1.79-32	-5.06-32	-1.68-31	-7.65-31	-7.59-30
15	0.00+00	9.76-36	-7.86-36	-6.01-35	-1.96-34	-5.18-34	-1.29-33	-3.22-33	-8.51-33	-2.47-32	-8.41-32	-3.92-31	-4.00-30	
14	0.00+00	1.33-35	-4.69-36	-5.90-35	-2.02-34	-5.50-34	-1.41-33	-3.76-33	-1.11-32	-3.87-32	-1.85-31	-1.94-30		
13	0.00+00	1.84-35	1.71-37	-5.59-35	-2.07-34	-5.80-34	-1.55-33	-4.51-33	-1.58-32	-7.73-32	-8.32-31			
12	0.00+00	2.57-35	8.35-36	-4.73-35	-2.00-34	-5.82-34	-1.61-33	-5.24-33	-2.50-32	-2.75-31				
11	0.00+00	3.70-35	2.31-35	-2.48-35	-1.58-34	-4.58-34	-1.11-33	-3.29-33	-2.79-32					
10	0.00+00	5.52-35	5.11-35	3.13-35	-7.81-36	1.68-34	2.91-33	4.91-32						
9	0.00+00	8.58-35	1.07-34	1.71-34	4.93-34	3.24-33	4.84-32							
8	0.00+00	1.41-34	2.24-34	5.53-34	2.49-33	3.90-32								
7	0.00+00	2.47-34	5.06-34	1.90-33	1.76-32									
6	0.00+00	4.95-34	1.42-33	1.16-32										
5	0.00+00	1.29-33	7.75-33											
4	0.00+00	6.44-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.64-33	-2.10-33	-2.59-33	-3.08-33	-3.55-33	-3.99-33	-4.39-33	-4.76-33	-4.99-33	-5.26-33	-5.51-33	-5.71-33	-5.88-33	-6.00-33
45	-2.51-33	-3.27-33	-4.11-33	-4.98-33	-5.87-33	-6.75-33	-7.64-33	-8.53-33	-9.25-33	-1.01-32	-1.11-32	-1.21-32	-1.31-32	-1.43-32
40	-4.16-33	-5.56-33	-7.18-33	-8.97-33	-1.09-32	-1.30-32	-1.53-32	-1.79-32	-2.05-32	-2.38-32	-2.78-32	-3.27-32	-3.88-32	-4.68-32
35	-7.81-33	-1.08-32	-1.46-32	-1.91-32	-2.45-32	-3.11-32	-3.92-32	-4.96-32	-6.22-32	-8.03-32	-1.06-31	-1.44-31	-2.05-31	-3.08-31
30	-1.77-32	-2.63-32	-3.81-32	-5.45-32	-7.75-32	-1.11-31	-1.61-31	-2.42-31	-3.75-31	-6.36-31	-1.21-30	-2.75-30	-8.73-30	-6.18-29
29	-2.16-32	-3.26-32	-4.85-32	-7.12-32	-1.04-31	-1.55-31	-2.37-31	-3.79-31	-6.43-31	-1.23-30	-2.83-30	-9.03-30	-6.43-29	
28	-2.67-32	-4.13-32	-6.30-32	-9.55-32	-1.46-31	-2.28-31	-3.71-31	-6.46-31	-1.24-30	-2.87-30	-9.25-30	-6.62-29		
27	-3.36-32	-5.33-32	-8.41-32	-1.33-31	-2.13-31	-3.54-31	-6.27-31	-1.24-30	-2.87-30	-9.32-30	-6.74-29			
26	-4.30-32	-7.07-32	-1.16-31	-1.92-31	-3.28-31	-5.95-31	-1.19-30	-2.84-30	-9.27-30	-6.74-29				
25	-5.65-32	-9.66-32	-1.66-31	-2.94-31	-5.48-31	-1.12-30	-2.71-30	-9.06-30	-6.67-29					
24	-7.63-32	-1.37-31	-2.52-31	-4.86-31	-1.02-30	-2.53-30	-8.56-30	-6.29-29						
23	-1.06-31	-2.03-31	-4.06-31	-8.85-31	-2.25-30	-7.81-30	-5.91-29							
22	-1.55-31	-3.24-31	-7.35-31	-1.94-30	-6.93-30	-5.38-29								
21	-2.42-31	-5.74-31	-1.58-30	-5.84-30	-4.68-29									
20	-4.16-31	-1.19-30	-4.62-30	-3.84-29										
19	-8.35-31	-3.38-30	-2.94-29											
18	-2.26-30	-2.07-29												
17	-1.32-29													

H TE = 5.00+03 NE = 1.00+08 CASE B NC = 20

TOTAL RC = 5.081-13 4-2 RC = 6.185-14 4-2 EM = 2.528-25 2S RC = 1.592-13 2P RC = 3.489-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.41-03	4.32-04	1.86-04	9.62-05	5.61-05	3.55-05	2.39-05	1.69-05	1.23-05	9.28-06	7.16-06	5.64-06	4.52-06	3.68-06
45	1.94-03	5.94-04	2.55-04	1.32-04	7.71-05	4.89-05	3.29-05	2.32-05	1.69-05	1.28-05	9.84-06	7.75-06	6.21-06	5.05-06
40	2.77-03	8.49-04	3.65-04	1.89-04	1.10-04	6.98-05	4.69-05	3.31-05	2.42-05	1.82-05	1.40-05	1.11-05	8.86-06	7.21-06
35	4.15-03	1.27-03	5.47-04	2.83-04	1.65-04	1.05-04	7.03-05	4.95-05	3.62-05	2.72-05	2.10-05	1.65-05	1.33-05	1.08-05
30	6.61-03	2.03-03	8.72-04	4.51-04	2.63-04	1.67-04	1.12-04	7.89-05	5.76-05	4.33-05	3.34-05	2.63-05	2.11-05	1.71-05
29	7.33-03	2.25-03	9.65-04	5.00-04	2.91-04	1.84-04	1.24-04	8.73-05	6.38-05	4.80-05	3.70-05	2.91-05	2.33-05	1.89-05
28	8.15-03	2.50-03	1.07-03	5.56-04	3.24-04	2.05-04	1.38-04	9.71-05	7.09-05	5.33-05	4.11-05	3.23-05	2.59-05	2.10-05
27	9.09-03	2.79-03	1.20-03	6.20-04	3.61-04	2.29-04	1.54-04	1.08-04	7.90-05	5.94-05	4.58-05	3.60-05	2.88-05	2.34-05
26	1.02-02	3.12-03	1.34-03	6.94-04	4.04-04	2.56-04	1.72-04	1.21-04	8.84-05	6.65-05	5.12-05	4.03-05	3.22-05	2.62-05
25	1.14-02	3.51-03	1.51-03	7.80-04	4.54-04	2.88-04	1.93-04	1.36-04	9.93-05	7.46-05	5.75-05	4.52-05	3.61-05	2.93-05
24	1.29-02	3.96-03	1.70-03	8.80-04	5.13-04	3.24-04	2.18-04	1.53-04	1.12-04	8.41-05	6.48-05	5.09-05	4.07-05	3.30-05
23	1.46-02	4.48-03	1.93-03	9.96-04	5.81-04	3.67-04	2.47-04	1.74-04	1.27-04	9.52-05	7.33-05	5.75-05	4.60-05	3.73-05
22	1.66-02	5.10-03	2.19-03	1.13-03	6.60-04	4.17-04	2.80-04	1.97-04	1.44-04	1.08-04	8.31-05	6.53-05	5.21-05	4.22-05
21	1.90-02	5.82-03	2.50-03	1.29-03	7.53-04	4.76-04	3.20-04	2.25-04	1.64-04	1.23-04	9.46-05	7.42-05	5.92-05	4.78-05
20	2.17-02	6.65-03	2.86-03	1.48-03	8.60-04	5.44-04	3.65-04	2.57-04	1.87-04	1.40-04	1.08-04	8.45-05	6.73-05	5.43-05
19	2.49-02	7.63-03	3.27-03	1.69-03	9.86-04	6.23-04	4.18-04	2.94-04	2.14-04	1.61-04	1.23-04	9.64-05	7.66-05	6.15-05
18	2.86-02	8.75-03	3.76-03	1.94-03	1.13-03	7.14-04	4.79-04	3.37-04	2.45-04	1.84-04	1.41-04	1.10-04	8.69-05	6.93-05
17	3.27-02	1.00-02	4.30-03	2.22-03	1.29-03	8.18-04	5.48-04	3.85-04	2.80-04	2.09-04	1.60-04	1.24-04	9.77-05	7.66-05
16	3.74-02	1.14-02	4.91-03	2.54-03	1.48-03	9.32-04	6.25-04	4.38-04	3.18-04	2.37-04	1.81-04	1.40-04	1.08-04	7.95-05
15	4.24-02	1.30-02	5.58-03	2.88-03	1.68-03	1.06-03	7.08-04	4.96-04	3.59-04	2.67-04	2.02-04	1.53-04	1.11-04	
14	4.79-02	1.47-02	6.30-03	3.25-03	1.89-03	1.19-03	7.97-04	5.57-04	4.02-04	2.97-04	2.21-04	1.58-04		
13	5.42-02	1.66-02	7.12-03	3.68-03	2.14-03	1.35-03	8.98-04	6.25-04	4.48-04	3.25-04	2.28-04			
12	6.21-02	1.90-02	8.16-03	4.21-03	2.45-03	1.54-03	1.02-03	7.08-04	5.00-04	3.42-04				
11	7.31-02	2.24-02	9.63-03	4.97-03	2.88-03	1.81-03	1.20-03	8.15-04	5.42-04					
10	8.92-02	2.74-02	1.18-02	6.09-03	3.53-03	2.20-03	1.44-03	9.23-04						
9	1.13-01	3.48-02	1.50-02	7.76-03	4.49-03	2.77-03	1.71-03							
8	1.48-01	4.59-02	2.00-02	1.04-02	5.95-03	3.49-03								
7	2.03-01	6.37-02	2.81-02	1.46-02	8.04-03									
6	2.99-01	9.54-02	4.27-02	2.16-02										
5	4.97-01	1.60-01	7.05-02											
4	1.00+00	3.11-01												
3	2.74+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.03-06	2.53-06	2.13-06	1.82-06	1.56-06	1.35-06	1.17-06	1.02-06	9.01-07	7.97-07	7.09-07	6.33-07	5.67-07	5.10-07
45	4.17-06	3.48-06	2.93-06	2.49-06	2.14-06	1.85-06	1.61-06	1.40-06	1.24-06	1.09-06	9.71-07	8.66-07	7.76-07	6.98-07
40	5.94-06	4.96-06	4.18-06	3.55-06	3.04-06	2.63-06	2.28-06	2.00-06	1.76-06	1.55-06	1.38-06	1.23-06	1.10-06	9.88-07
35	8.88-06	7.40-06	6.24-06	5.30-06	4.54-06	3.92-06	3.40-06	2.97-06	2.61-06	2.30-06	2.04-06	1.82-06	1.62-06	1.45-06
30	1.41-05	1.17-05	9.88-06	8.38-06	7.17-06	6.17-06	5.35-06	4.66-06	4.07-06	3.57-06	3.13-06	2.74-06	2.37-06	1.93-06
29	1.56-05	1.30-05	1.09-05	9.26-06	7.92-06	6.81-06	5.90-06	5.13-06	4.47-06	3.90-06	3.40-06	2.92-06	2.57-06	
28	1.73-05	1.44-05	1.21-05	1.03-05	8.77-06	7.53-06	6.51-06	5.65-06	4.91-06	4.25-06	3.64-06	2.94-06		
27	1.93-05	1.60-05	1.35-05	1.14-05	9.73-06	8.35-06	7.20-06	6.22-06	5.36-06	4.57-06	3.68-06			
26	2.15-05	1.79-05	1.50-05	1.27-05	1.08-05	9.27-06	7.96-06	6.82-06	5.78-06	4.63-06				
25	2.41-05	2.00-05	1.68-05	1.42-05	1.21-05	1.03-05	8.76-06	7.39-06	5.89-06					
24	2.71-05	2.25-05	1.88-05	1.59-05	1.34-05	1.14-05	9.52-06	7.55-06						
23	3.06-05	2.53-05	2.11-05	1.78-05	1.49-05	1.24-05	9.78-06							
22	3.45-05	2.85-05	2.37-05	1.98-05	1.63-05	1.28-05								
21	3.91-05	3.22-05	2.66-05	2.18-05	1.69-05									
20	4.42-05	3.61-05	2.93-05	2.26-05										
19	4.97-05	3.99-05	3.05-05											
18	5.50-05	4.16-05												
17	5.73-05													

H TE = 5.00+03 NE = 1.00+08 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.01-30	-2.64-38	-1.35-36	-4.83-36	-1.23-35	-2.66-35	-5.12-35	-9.04-35	-1.48-34	-2.26-34	-3.19-34	-4.12-34	-4.87-34	-5.31-34
45	5.51-30	-3.89-38	-1.88-36	-6.72-36	-1.72-35	-3.73-35	-7.23-35	-1.29-34	-2.12-34	-3.27-34	-4.66-34	-6.10-34	-7.32-34	-8.11-34
40	7.86-30	-6.05-38	-2.71-36	-9.75-36	-2.52-35	-5.49-35	-1.07-34	-1.92-34	-3.22-34	-5.02-34	-7.26-34	-9.66-34	-1.18-33	-1.34-33
35	1.18-29	-1.00-37	-4.14-36	-1.49-35	-3.89-35	-8.57-35	-1.70-34	-3.09-34	-5.25-34	-8.35-34	-1.24-33	-1.69-33	-2.14-33	-2.52-33
30	1.88-29	-1.79-37	-6.76-36	-2.46-35	-6.50-35	-1.46-34	-2.94-34	-5.48-34	-9.57-34	-1.57-33	-2.41-33	-3.44-33	-4.57-33	-5.72-33
29	2.08-29	-2.02-37	-7.54-36	-2.75-35	-7.29-35	-1.64-34	-3.33-34	-6.24-34	-1.10-33	-1.82-33	-2.82-33	-4.07-33	-5.49-33	-6.98-33
28	2.31-29	-2.28-37	-8.43-36	-3.09-35	-8.21-35	-1.86-34	-3.79-34	-7.16-34	-1.27-33	-2.12-33	-3.33-33	-4.88-33	-6.68-33	-8.65-33
27	2.59-29	-2.59-37	-9.47-36	-3.48-35	-9.29-35	-2.11-34	-4.34-34	-8.27-34	-1.48-33	-2.50-33	-3.98-33	-5.91-33	-8.24-33	-1.09-32
26	2.90-29	-2.93-37	-1.07-35	-3.94-35	-1.06-34	-2.42-34	-5.01-34	-9.62-34	-1.74-33	-2.98-33	-4.81-33	-7.28-33	-1.04-32	-1.41-32
25	3.27-29	-3.30-37	-1.21-35	-4.48-35	-1.21-34	-2.79-34	-5.81-34	-1.13-33	-2.07-33	-3.60-33	-5.90-33	-9.10-33	-1.33-32	-1.86-32
24	3.70-29	-3.69-37	-1.38-35	-5.12-35	-1.39-34	-3.23-34	-6.81-34	-1.34-33	-2.49-33	-4.39-33	-7.35-33	-1.16-32	-1.74-32	-2.52-32
23	4.22-29	-4.08-37	-1.57-35	-5.89-35	-1.61-34	-3.77-34	-8.04-34	-1.60-33	-3.03-33	-5.45-33	-9.33-33	-1.52-32	-2.36-32	-3.56-32
22	4.83-29	-4.39-37	-1.80-35	-6.80-35	-1.87-34	-4.44-34	-9.58-34	-1.94-33	-3.73-33	-6.87-33	-1.21-32	-2.04-32	-3.30-32	-5.25-32
21	5.57-29	-4.52-37	-2.07-35	-7.88-35	-2.19-34	-5.26-34	-1.15-33	-2.37-33	-4.67-33	-8.85-33	-1.61-32	-2.83-32	-4.83-32	-8.22-32
20	6.47-29	-4.01-37	-2.37-35	-9.14-35	-2.57-34	-6.25-34	-1.39-33	-2.94-33	-5.94-33	-1.16-32	-2.21-32	-4.08-32	-7.44-32	-1.38-31
19	7.58-29	-2.84-37	-2.72-35	-1.06-34	-3.04-34	-7.50-34	-1.71-33	-3.69-33	-7.72-33	-1.57-32	-3.15-32	-6.22-32	-1.24-31	-2.62-31
18	8.96-29	-1.28-38	-3.11-35	-1.24-34	-3.59-34	-9.05-34	-2.11-33	-4.71-33	-1.03-32	-2.20-32	-4.71-32	-1.02-31	-2.31-31	-5.93-31
17	1.07-28	5.34-37	-3.52-35	-1.43-34	-4.24-34	-1.09-33	-2.63-33	-6.10-33	-1.40-32	-3.21-32	-7.51-32	-1.85-31	-5.09-31	-1.85-30
16	1.29-28	1.56-36	-3.90-35	-1.64-34	-4.97-34	-1.32-33	-3.29-33	-8.03-33	-1.96-32	-4.93-32	-1.31-31	-3.93-31	-1.54-30	-1.26-29
15	1.58-28	3.36-36	-4.19-35	-1.85-34	-5.75-34	-1.58-33	-4.14-33	-1.07-32	-2.87-32	-8.20-32	-2.66-31	-1.13-30	-9.98-30	
14	1.96-28	6.37-36	-4.29-35	-2.02-34	-6.55-34	-1.88-33	-5.21-33	-1.47-32	-4.46-32	-1.55-31	-7.16-31	-6.89-30		
13	2.48-28	1.11-35	-4.13-35	-2.16-34	-7.34-34	-2.22-33	-6.68-33	-2.13-32	-7.80-32	-3.84-31	-4.02-30			
12	3.21-28	1.82-35	-3.69-35	-2.28-34	-8.24-34	-2.68-33	-9.01-33	-3.45-32	-1.78-31	-1.97-30				
11	4.25-28	2.88-35	-2.94-35	-2.43-34	-9.56-34	-3.46-33	-1.38-32	-7.36-32	-8.44-31					
10	5.82-28	4.53-35	-1.67-35	-2.65-34	-1.18-33	-5.04-33	-2.77-32	-3.26-31						
9	8.28-28	7.28-35	9.27-36	-2.86-34	-1.57-33	-9.00-33	-1.07-31							
8	1.24-27	1.24-34	7.32-35	-2.54-34	-2.12-33	-2.36-32								
7	2.01-27	2.30-34	2.59-34	1.82-34	1.11-33									
6	3.61-27	4.88-34	9.57-34	5.71-33										
5	7.71-27	1.31-33	6.04-33											
4	2.31-26	6.51-33												
3	1.67-25													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.37-34	-5.05-34	-4.35-34	-3.27-34	-1.80-34	2.58-35	2.66-34	5.64-34	9.33-34	1.39-33	1.95-33	2.65-33	3.52-33	4.61-33
45	-8.38-34	-8.09-34	-7.23-34	-5.79-34	-3.71-34	-6.26-35	3.09-34	7.91-34	1.41-33	2.21-33	3.25-33	4.60-33	6.38-33	8.75-33
40	-1.43-33	-1.43-33	-1.35-33	-1.16-33	-8.71-34	-3.89-34	2.27-34	1.09-33	2.27-33	3.92-33	6.23-33	9.50-33	1.42-32	2.12-32
35	-2.80-33	-2.96-33	-2.99-33	-2.85-33	-2.52-33	-1.78-33	-7.18-34	9.92-34	3.71-33	8.11-33	1.53-32	2.77-32	4.97-32	9.17-32
30	-6.83-33	-7.88-33	-8.87-33	-9.77-33	-1.05-32	-1.05-32	-9.99-33	-7.56-33	-7.40-34	1.75-32	6.91-32	2.39-31	1.03-30	9.24-30
29	-8.50-33	-1.01-32	-1.17-32	-1.33-32	-1.51-32	-1.62-32	-1.72-32	-1.64-32	-1.02-32	1.42-32	1.09-31	5.92-31	5.96-30	
28	-1.08-32	-1.31-32	-1.57-32	-1.88-32	-2.24-32	-2.61-32	-3.11-32	-3.61-32	-3.75-32	-1.40-32	1.86-31	2.93-30		
27	-1.40-32	-1.75-32	-2.18-32	-2.74-32	-3.50-32	-4.46-32	-6.04-32	-8.59-32	-1.31-31	-2.05-31	7.09-32			
26	-1.85-32	-2.41-32	-3.16-32	-4.20-32	-5.80-32	-8.27-32	-1.31-31	-2.39-31	-5.74-31	-2.72-30				
25	-2.54-32	-3.45-32	-4.78-32	-6.85-32	-1.04-31	-1.72-31	-3.40-31	-9.12-31	-5.28-30					
24	-3.60-32	-5.18-32	-7.70-32	-1.21-31	-2.12-31	-4.30-31	-1.23-30	-7.62-30						
23	-5.36-32	-8.26-32	-1.35-31	-2.42-31	-5.17-31	-1.50-30	-9.81-30							
22	-8.46-32	-1.43-31	-2.65-31	-5.82-31	-1.76-30	-1.17-29								
21	-1.45-31	-2.78-31	-6.28-31	-1.95-30	-1.32-29									
20	-2.77-31	-6.45-31	-2.06-30	-1.43-29										
19	-6.38-31	-2.10-30	-1.51-29											
18	-2.04-30	-1.51-29												
17	-1.43-29													

H TE = 5.00+03 NE = 1.00+09 CASE B NC = 20

TOTAL RC = 5.590-13 4-2 RC = 7.027-14 4-2 EM = 2.872-25 2S RC = 1.710-13 2P RC = 3.880-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.24-03	3.80-04	1.63-04	8.47-05	4.94-05	3.13-05	2.11-05	1.48-05	1.08-05	8.17-06	6.30-06	4.97-06	3.98-06	3.24-06
45	1.71-03	5.23-04	2.25-04	1.16-04	6.79-05	4.30-05	2.90-05	2.04-05	1.49-05	1.12-05	8.66-06	6.82-06	5.47-06	4.45-06
40	2.44-03	7.48-04	3.21-04	1.66-04	9.71-05	6.15-05	4.14-05	2.91-05	2.13-05	1.60-05	1.24-05	9.74-06	7.81-06	6.35-06
35	3.66-03	1.12-03	4.82-04	2.50-04	1.46-04	9.22-05	6.20-05	4.37-05	3.19-05	2.40-05	1.85-05	1.46-05	1.17-05	9.51-06
30	5.86-03	1.80-03	7.72-04	4.00-04	2.33-04	1.48-04	9.92-05	6.99-05	5.10-05	3.84-05	2.96-05	2.33-05	1.87-05	1.52-05
29	6.50-03	1.99-03	8.56-04	4.43-04	2.58-04	1.64-04	1.10-04	7.75-05	5.66-05	4.26-05	3.28-05	2.58-05	2.07-05	1.68-05
28	7.24-03	2.22-03	9.53-04	4.94-04	2.88-04	1.82-04	1.22-04	8.62-05	6.30-05	4.74-05	3.65-05	2.87-05	2.30-05	1.87-05
27	8.09-03	2.48-03	1.07-03	5.52-04	3.22-04	2.04-04	1.37-04	9.63-05	7.04-05	5.29-05	4.08-05	3.21-05	2.57-05	2.08-05
26	9.09-03	2.79-03	1.20-03	6.19-04	3.61-04	2.28-04	1.54-04	1.08-04	7.89-05	5.94-05	4.57-05	3.60-05	2.88-05	2.34-05
25	1.03-02	3.14-03	1.35-03	6.99-04	4.07-04	2.58-04	1.73-04	1.22-04	8.90-05	6.69-05	5.15-05	4.05-05	3.24-05	2.63-05
24	1.16-02	3.56-03	1.53-03	7.92-04	4.61-04	2.92-04	1.96-04	1.38-04	1.01-04	7.57-05	5.83-05	4.58-05	3.66-05	2.97-05
23	1.32-02	4.06-03	1.74-03	9.02-04	5.26-04	3.33-04	2.23-04	1.57-04	1.15-04	8.62-05	6.64-05	5.21-05	4.16-05	3.37-05
22	1.52-02	4.66-03	2.00-03	1.03-03	6.03-04	3.81-04	2.56-04	1.80-04	1.31-04	9.87-05	7.59-05	5.96-05	4.76-05	3.85-05
21	1.75-02	5.37-03	2.31-03	1.19-03	6.95-04	4.39-04	2.95-04	2.08-04	1.51-04	1.14-04	8.73-05	6.85-05	5.46-05	4.41-05
20	2.04-02	6.24-03	2.68-03	1.38-03	8.06-04	5.10-04	3.42-04	2.41-04	1.75-04	1.32-04	1.01-04	7.92-05	6.30-05	5.08-05
19	2.38-02	7.30-03	3.13-03	1.62-03	9.43-04	5.96-04	4.00-04	2.81-04	2.05-04	1.53-04	1.18-04	9.21-05	7.31-05	5.87-05
18	2.81-02	8.60-03	3.69-03	1.91-03	1.11-03	7.01-04	4.70-04	3.30-04	2.40-04	1.80-04	1.38-04	1.08-04	8.51-05	6.79-05
17	3.33-02	1.02-02	4.38-03	2.26-03	1.32-03	8.31-04	5.57-04	3.91-04	2.84-04	2.12-04	1.62-04	1.26-04	9.91-05	7.77-05
16	3.98-02	1.22-02	5.23-03	2.70-03	1.57-03	9.92-04	6.64-04	4.66-04	3.38-04	2.52-04	1.92-04	1.48-04	1.14-04	8.42-05
15	4.79-02	1.47-02	6.29-03	3.25-03	1.89-03	1.19-03	7.96-04	5.57-04	4.04-04	3.00-04	2.27-04	1.72-04	1.25-04	
14	5.78-02	1.77-02	7.59-03	3.91-03	2.27-03	1.43-03	9.57-04	6.68-04	4.82-04	3.55-04	2.64-04	1.88-04		
13	6.97-02	2.13-02	9.14-03	4.71-03	2.73-03	1.72-03	1.15-03	7.97-04	5.70-04	4.13-04	2.89-04			
12	8.34-02	2.55-02	1.09-02	5.62-03	3.26-03	2.04-03	1.36-03	9.37-04	6.59-04	4.50-04				
11	9.82-02	3.00-02	1.28-02	6.60-03	3.82-03	2.39-03	1.57-03	1.07-03	7.07-04					
10	1.14-01	3.49-02	1.49-02	7.65-03	4.41-03	2.74-03	1.77-03	1.13-03						
9	1.35-01	4.11-02	1.75-02	8.97-03	5.13-03	3.14-03	1.92-03							
8	1.67-01	5.09-02	2.17-02	1.10-02	6.22-03	3.59-03								
7	2.23-01	6.78-02	2.88-02	1.45-02	7.71-03									
6	3.21-01	9.79-02	4.12-02	1.97-02										
5	5.17-01	1.56-01	6.32-02											
4	1.00+00	2.83-01												
3	2.61+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.67-06	2.23-06	1.88-06	1.60-06	1.37-06	1.18-06	1.03-06	9.02-07	7.94-07	7.02-07	6.24-07	5.57-07	4.99-07	4.49-07
45	3.67-06	3.06-06	2.58-06	2.19-06	1.88-06	1.63-06	1.41-06	1.24-06	1.09-06	9.62-07	8.55-07	7.63-07	6.84-07	6.15-07
40	5.24-06	4.37-06	3.68-06	3.13-06	2.68-06	2.32-06	2.01-06	1.76-06	1.55-06	1.37-06	1.21-06	1.08-06	9.69-07	8.70-07
35	7.84-06	6.53-06	5.50-06	4.68-06	4.01-06	3.46-06	3.00-06	2.62-06	2.30-06	2.03-06	1.80-06	1.60-06	1.43-06	1.28-06
30	1.25-05	1.04-05	8.75-06	7.42-06	6.35-06	5.47-06	4.74-06	4.13-06	3.61-06	3.16-06	2.78-06	2.43-06	2.10-06	1.71-06
29	1.38-05	1.15-05	9.68-06	8.21-06	7.02-06	6.04-06	5.23-06	4.55-06	3.97-06	3.46-06	3.02-06	2.59-06	2.11-06	
28	1.54-05	1.28-05	1.08-05	9.17-06	7.79-06	6.69-06	5.78-06	5.02-06	4.36-06	3.78-06	3.23-06	2.62-06		
27	1.71-05	1.43-05	1.20-05	1.02-05	8.66-06	7.44-06	6.41-06	5.54-06	4.77-06	4.07-06	3.28-06			
26	1.92-05	1.60-05	1.34-05	1.13-05	9.66-06	8.27-06	7.10-06	6.09-06	5.16-06	4.14-06				
25	2.16-05	1.79-05	1.50-05	1.27-05	1.08-05	9.21-06	7.85-06	6.62-06	5.28-06					
24	2.44-05	2.02-05	1.70-05	1.43-05	1.21-05	1.02-05	8.57-06	6.80-06						
23	2.77-05	2.29-05	1.92-05	1.61-05	1.35-05	1.12-05	8.86-06							
22	3.15-05	2.61-05	2.17-05	1.81-05	1.49-05	1.17-05								
21	3.61-05	2.97-05	2.45-05	2.01-05	1.56-05									
20	4.14-05	3.38-05	2.74-05	2.11-05										
19	4.74-05	3.81-05	2.91-05											
18	5.39-05	4.07-05												
17	5.80-05													

H TE = 5.00+03 NE = 1.00+09 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.76-30	-7.51-38	-1.40-36	-4.64-36	-1.18-35	-2.34-35	-4.17-35	-6.35-35	-7.92-35	-7.73-35	-5.25-35	-6.09-36	5.97-35	1.44-34
45	5.17-30	-1.06-37	-1.94-36	-6.46-36	-1.59-35	-3.29-35	-5.90-35	-9.05-35	-1.14-34	-1.13-34	-7.98-35	-1.45-35	8.00-35	2.04-34
40	7.38-30	-1.57-37	-2.80-36	-9.39-36	-2.33-35	-4.85-35	-8.77-35	-1.36-34	-1.75-34	-1.77-34	-1.31-34	-3.50-35	1.09-34	3.02-34
35	1.10-29	-2.48-37	-4.28-36	-1.44-35	-3.61-35	-7.61-35	-1.40-34	-2.20-34	-2.89-34	-3.03-34	-2.39-34	-9.07-35	1.44-34	4.74-34
30	1.76-29	-4.25-37	-7.05-36	-2.40-35	-6.08-35	-1.30-34	-2.44-34	-3.96-34	-5.38-34	-5.95-34	-5.14-34	-2.73-34	1.50-34	7.97-34
29	1.95-29	-4.80-37	-7.87-36	-2.69-35	-6.83-35	-1.47-34	-2.78-34	-4.54-34	-6.22-34	-6.96-34	-6.15-34	-3.49-34	1.32-34	8.89-34
28	2.17-29	-5.45-37	-8.84-36	-3.02-35	-7.72-35	-1.67-34	-3.17-34	-5.23-34	-7.25-34	-8.23-34	-7.46-34	-4.53-34	9.85-35	9.91-34
27	2.43-29	-6.21-37	-9.96-36	-3.42-35	-8.78-35	-1.91-34	-3.66-34	-6.08-34	-8.52-34	-9.84-34	-9.16-34	-5.96-34	3.88-35	1.10-33
26	2.72-29	-7.13-37	-1.13-35	-3.89-35	-1.00-34	-2.20-34	-4.24-34	-7.13-34	-1.01-33	-1.19-33	-1.14-33	-7.96-34	-6.47-35	1.21-33
25	3.07-29	-8.23-37	-1.29-35	-4.45-35	-1.16-34	-2.56-34	-4.97-34	-8.44-34	-1.22-33	-1.46-33	-1.45-33	-1.08-33	-2.41-34	1.31-33
24	3.47-29	-9.57-37	-1.48-35	-5.13-35	-1.34-34	-2.99-34	-5.88-34	-1.01-33	-1.48-33	-1.83-33	-1.88-33	-1.51-33	-5.43-34	1.37-33
23	3.96-29	-1.12-36	-1.71-35	-5.96-35	-1.57-34	-3.53-34	-7.03-34	-1.23-33	-1.84-33	-2.32-33	-2.48-33	-2.15-33	-1.07-33	1.29-33
22	4.53-29	-1.32-36	-1.99-35	-6.98-35	-1.85-34	-4.22-34	-8.51-34	-1.51-33	-2.32-33	-3.02-33	-3.38-33	-3.17-33	-2.02-33	8.95-34
21	5.23-29	-1.57-36	-2.33-35	-8.24-35	-2.21-34	-5.10-34	-1.05-33	-1.90-33	-2.99-33	-4.03-33	-4.75-33	-4.84-33	-3.79-33	-3.04-34
20	6.07-29	-1.87-36	-2.75-35	-9.83-35	-2.67-34	-6.25-34	-1.31-33	-2.43-33	-3.94-33	-5.55-33	-6.93-33	-7.74-33	-7.30-33	-3.55-33
19	7.11-29	-2.26-36	-3.29-35	-1.19-34	-3.27-34	-7.79-34	-1.66-33	-3.19-33	-5.37-33	-7.95-33	-1.06-32	-1.32-32	-1.50-32	-1.33-32
18	8.41-29	-2.73-36	-3.97-35	-1.45-34	-4.05-34	-9.87-34	-2.17-33	-4.30-33	-7.58-33	-1.19-32	-1.74-32	-2.45-32	-3.42-32	-4.71-32
17	1.00-28	-3.31-36	-4.83-35	-1.79-34	-5.11-34	-1.28-33	-2.90-33	-6.01-33	-1.12-32	-1.91-32	-3.09-32	-5.11-32	-9.25-32	-2.09-31
16	1.21-28	-4.00-36	-5.94-35	-2.24-34	-6.55-34	-1.69-33	-4.00-33	-8.75-33	-1.76-32	-3.30-32	-6.19-32	-1.28-31	-3.45-31	-1.93-30
15	1.48-28	-4.76-36	-7.36-35	-2.84-34	-8.56-34	-2.30-33	-5.73-33	-1.34-32	-2.97-32	-6.42-32	-1.49-31	-4.47-31	-2.83-30	
14	1.84-28	-5.62-36	-9.15-35	-3.64-34	-1.14-33	-3.21-33	-8.58-33	-2.21-32	-5.61-32	-1.49-31	-4.97-31	-3.44-30		
13	2.33-28	-6.96-36	-1.13-34	-4.68-34	-1.54-33	-4.63-33	-1.36-32	-4.00-32	-1.25-31	-4.75-31	-3.63-30			
12	3.01-28	-8.18-36	-1.37-34	-5.97-34	-2.09-33	-6.89-33	-2.30-32	-8.36-32	-3.73-31	-3.25-30				
11	3.99-28	6.93-37	-1.59-34	-7.47-34	-2.85-33	-1.07-32	-4.36-32	-2.27-31	-2.33-30					
10	5.46-28	1.22-35	-1.72-34	-9.07-34	-3.90-33	-1.77-32	-1.03-31	-1.23-30						
9	7.77-28	3.42-35	-1.74-34	-1.10-33	-5.71-33	-3.63-32	-4.77-31							
8	1.17-27	7.44-35	-1.70-34	-1.47-33	-1.07-32	-1.50-31								
7	1.88-27	1.96-34	-1.48-34	-2.47-33	-3.95-32									
6	3.38-27	3.62-34	1.56-35	-6.84-33										
5	7.24-27	1.07-33	1.80-33											
4	2.17-26	5.67-33												
3	1.57-25													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.47-34	3.72-34	5.22-34	7.01-34	9.17-34	1.18-33	1.49-33	1.87-33	2.33-33	2.89-33	3.57-33	4.41-33	5.45-33	6.74-33
45	3.58-34	5.49-34	7.83-34	1.07-33	1.42-33	1.87-33	2.41-33	3.09-33	3.93-33	5.01-33	6.37-33	8.13-33	1.04-32	1.34-32
40	5.51-34	8.68-34	1.27-33	1.78-33	2.43-33	3.28-33	4.38-33	5.81-33	7.71-33	1.03-32	1.37-32	1.85-32	2.53-32	3.51-32
35	9.22-34	1.52-33	2.32-33	3.39-33	4.86-33	6.90-33	9.74-33	1.38-32	1.97-32	2.87-32	4.26-32	6.51-32	1.04-31	1.75-31
30	1.75-33	3.14-33	5.18-33	8.24-33	1.29-32	2.05-32	3.28-32	5.43-32	9.44-32	1.77-31	3.69-31	9.21-31	3.21-30	2.47-29
29	2.03-33	3.74-33	6.32-33	1.03-32	1.67-32	2.74-32	4.61-32	8.10-32	1.53-31	3.22-31	8.09-31	2.83-30	2.20-29	
28	2.37-33	4.51-33	7.86-33	1.33-32	2.23-32	3.83-32	6.84-32	1.31-31	2.77-31	7.02-31	2.47-30	1.92-29		
27	2.81-33	5.54-33	1.00-32	1.76-32	3.10-32	5.66-32	1.10-31	2.36-31	6.03-31	2.14-30	1.68-29			
26	3.35-33	6.93-33	1.31-32	2.40-32	4.54-32	9.01-32	1.97-31	5.10-31	1.82-30	1.44-29				
25	4.05-33	8.89-33	1.78-32	3.50-32	7.16-32	1.60-31	4.22-31	1.53-30	1.22-29					
24	4.95-33	1.17-32	2.53-32	5.45-32	1.26-31	3.41-31	1.26-30	1.02-29						
23	6.11-33	1.61-32	3.84-32	9.40-32	2.63-31	9.99-31	8.26-30							
22	7.56-33	2.33-32	6.41-32	1.92-31	7.59-31	6.43-30								
21	9.22-33	3.61-32	1.25-31	5.37-31	4.83-30									
20	1.04-32	6.34-32	3.29-31	3.25-30										
19	5.37-33	1.33-31	1.77-30											
18	-4.73-32	4.07-31												
17	-8.36-31													

H TE = 5.00+03 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 6.598-13 4-2 RC = 8.498-14 4-2 EM = 3.473-25 2S RC = 1.679-13 2P RC = 4.919-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.03-03	3.15-04	1.35-04	7.00-05	4.08-05	2.59-05	1.74-05	1.23-05	8.97-06	6.75-06	5.21-06	4.11-06	3.29-06	2.68-06
45	1.41-03	4.33-04	1.86-04	9.63-05	5.62-05	3.56-05	2.39-05	1.69-05	1.23-05	9.29-06	7.17-06	5.64-06	4.52-06	3.68-06
40	2.02-03	6.18-04	2.66-04	1.38-04	8.03-05	5.08-05	3.42-05	2.41-05	1.76-05	1.33-05	1.02-05	8.06-06	6.46-06	5.25-06
35	3.03-03	9.29-04	3.99-04	2.07-04	1.20-04	7.63-05	5.13-05	3.62-05	2.64-05	1.99-05	1.53-05	1.21-05	9.67-06	7.87-06
30	4.85-03	1.49-03	6.39-04	3.31-04	1.93-04	1.22-04	8.21-05	5.78-05	4.22-05	3.18-05	2.45-05	1.93-05	1.54-05	1.25-05
29	5.38-03	1.65-03	7.09-04	3.67-04	2.14-04	1.35-04	9.11-05	6.41-05	4.69-05	3.52-05	2.72-05	2.14-05	1.71-05	1.39-05
28	5.99-03	1.84-03	7.90-04	4.09-04	2.38-04	1.51-04	1.01-04	7.14-05	5.22-05	3.92-05	3.02-05	2.38-05	1.90-05	1.55-05
27	6.71-03	2.06-03	8.83-04	4.57-04	2.66-04	1.69-04	1.13-04	7.98-05	5.83-05	4.38-05	3.38-05	2.66-05	2.13-05	1.73-05
26	7.53-03	2.31-03	9.92-04	5.13-04	2.99-04	1.89-04	1.27-04	8.96-05	6.54-05	4.92-05	3.79-05	2.98-05	2.38-05	1.94-05
25	8.50-03	2.61-03	1.12-03	5.80-04	3.38-04	2.14-04	1.44-04	1.01-04	7.38-05	5.55-05	4.27-05	3.36-05	2.69-05	2.18-05
24	9.65-03	2.96-03	1.27-03	6.57-04	3.83-04	2.42-04	1.63-04	1.15-04	8.37-05	6.29-05	4.84-05	3.81-05	3.04-05	2.47-05
23	1.10-02	3.38-03	1.45-03	7.50-04	4.37-04	2.76-04	1.86-04	1.31-04	9.54-05	7.17-05	5.52-05	4.33-05	3.46-05	2.80-05
22	1.26-02	3.88-03	1.66-03	8.61-04	5.02-04	3.17-04	2.13-04	1.50-04	1.09-04	8.21-05	6.32-05	4.96-05	3.96-05	3.21-05
21	1.46-02	4.48-03	1.92-03	9.95-04	5.80-04	3.67-04	2.46-04	1.73-04	1.26-04	9.48-05	7.29-05	5.72-05	4.56-05	3.68-05
20	1.70-02	5.22-03	2.24-03	1.16-03	6.75-04	4.27-04	2.87-04	2.01-04	1.47-04	1.10-04	8.46-05	6.63-05	5.28-05	4.26-05
19	2.00-02	6.14-03	2.63-03	1.36-03	7.93-04	5.01-04	3.36-04	2.36-04	1.72-04	1.29-04	9.90-05	7.74-05	6.15-05	4.94-05
18	2.37-02	7.27-03	3.12-03	1.61-03	9.39-04	5.93-04	3.98-04	2.79-04	2.03-04	1.52-04	1.17-04	9.10-05	7.20-05	5.74-05
17	2.85-02	8.72-03	3.74-03	1.93-03	1.12-03	7.10-04	4.76-04	3.34-04	2.43-04	1.81-04	1.39-04	1.08-04	8.46-05	6.63-05
16	3.45-02	1.06-02	4.53-03	2.34-03	1.36-03	8.58-04	5.75-04	4.03-04	2.92-04	2.18-04	1.66-04	1.28-04	9.88-05	7.28-05
15	4.23-02	1.30-02	5.56-03	2.87-03	1.67-03	1.05-03	7.03-04	4.92-04	3.56-04	2.65-04	2.00-04	1.52-04	1.10-04	
14	5.27-02	1.61-02	6.91-03	3.57-03	2.07-03	1.30-03	8.71-04	6.08-04	4.38-04	3.23-04	2.40-04	1.71-04		
13	6.66-02	2.04-02	8.72-03	4.50-03	2.61-03	1.64-03	1.09-03	7.59-04	5.44-04	3.94-04	2.75-04			
12	8.54-02	2.61-02	1.12-02	5.75-03	3.33-03	2.09-03	1.39-03	9.56-04	6.72-04	4.58-04				
11	1.11-01	3.38-02	1.44-02	7.43-03	4.29-03	2.68-03	1.77-03	1.20-03	7.92-04					
10	1.44-01	4.39-02	1.87-02	9.61-03	5.53-03	3.43-03	2.22-03	1.42-03						
9	1.84-01	5.61-02	2.39-02	1.22-02	6.97-03	4.25-03	2.59-03							
8	2.27-01	6.91-02	2.93-02	1.49-02	8.34-03	4.78-03								
7	2.76-01	8.35-02	3.51-02	1.75-02	9.27-03									
6	3.61-01	1.08-01	4.50-02	2.12-02										
5	5.44-01	1.61-01	6.32-02											
4	1.00+00	2.78-01												
3	2.55+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.21-06	1.84-06	1.55-06	1.32-06	1.13-06	9.79-07	8.52-07	7.46-07	6.56-07	5.80-07	5.16-07	4.61-07	4.13-07	3.71-07
45	3.04-06	2.53-06	2.13-06	1.82-06	1.56-06	1.34-06	1.17-06	1.02-06	9.00-07	7.96-07	7.07-07	6.31-07	5.65-07	5.08-07
40	4.33-06	3.61-06	3.04-06	2.59-06	2.22-06	1.92-06	1.67-06	1.46-06	1.28-06	1.13-06	1.00-06	8.96-07	8.02-07	7.20-07
35	6.48-06	5.41-06	4.55-06	3.87-06	3.31-06	2.86-06	2.48-06	2.17-06	1.91-06	1.68-06	1.49-06	1.33-06	1.18-06	1.06-06
30	1.03-05	8.61-06	7.24-06	6.15-06	5.26-06	4.53-06	3.92-06	3.42-06	2.99-06	2.62-06	2.30-06	2.01-06	1.73-06	1.41-06
29	1.14-05	9.53-06	8.02-06	6.80-06	5.81-06	5.00-06	4.33-06	3.76-06	3.28-06	2.87-06	2.50-06	2.15-06	1.74-06	
28	1.27-05	1.06-05	8.91-06	7.55-06	6.45-06	5.54-06	4.79-06	4.16-06	3.61-06	3.13-06	2.68-06	2.17-06		
27	1.42-05	1.18-05	9.93-06	8.41-06	7.18-06	6.16-06	5.31-06	4.59-06	3.96-06	3.37-06	2.71-06			
26	1.59-05	1.32-05	1.11-05	9.40-06	8.01-06	6.86-06	5.89-06	5.05-06	4.28-06	3.43-06				
25	1.79-05	1.49-05	1.25-05	1.05-05	8.96-06	7.64-06	6.51-06	5.49-06	4.38-06					
24	2.03-05	1.68-05	1.41-05	1.19-05	1.00-05	8.50-06	7.12-06	5.64-06						
23	2.30-05	1.91-05	1.59-05	1.34-05	1.12-05	9.34-06	7.36-06							
22	2.63-05	2.17-05	1.81-05	1.50-05	1.24-05	9.72-06								
21	3.01-05	2.48-05	2.05-05	1.68-05	1.30-05									
20	3.46-05	2.83-05	2.30-05	1.77-05										
19	3.99-05	3.20-05	2.45-05											
18	4.56-05	3.44-05												
17	4.95-05													

H TE = 5.00+03 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.80-30	-1.39-37	-1.24-36	-3.76-36	-8.07-36	-1.18-35	-7.46-36	1.09-35	4.20-35	8.30-35	1.33-34	1.94-34	2.67-34	3.55-34
45	2.47-30	-1.94-37	-1.72-36	-5.24-36	-1.13-35	-1.67-35	-1.09-35	1.47-35	5.85-35	1.17-34	1.90-34	2.79-34	3.88-34	5.21-34
40	3.52-30	-2.83-37	-2.49-36	-7.63-36	-1.66-35	-2.48-35	-1.69-35	2.03-35	8.52-35	1.74-34	2.86-34	4.26-34	6.00-34	8.17-34
35	5.27-30	-4.37-37	-3.82-36	-1.18-35	-2.59-35	-3.94-35	-2.83-35	2.87-35	1.31-34	2.75-34	4.62-34	7.03-34	1.01-33	1.41-33
30	8.41-30	-7.30-37	-6.30-36	-1.96-35	-4.39-35	-6.87-35	-5.37-35	4.07-35	2.19-34	4.79-34	8.34-34	1.31-33	1.96-33	2.86-33
29	9.32-30	-8.19-37	-7.04-36	-2.20-35	-4.95-35	-7.80-35	-6.22-35	4.34-35	2.45-34	5.43-34	9.56-34	1.52-33	2.30-33	3.38-33
28	1.04-29	-9.23-37	-7.91-36	-2.48-35	-5.60-35	-8.91-35	-7.27-35	4.59-35	2.76-34	6.21-34	1.10-33	1.78-33	2.72-33	4.06-33
27	1.16-29	-1.05-36	-8.93-36	-2.81-35	-6.39-35	-1.02-34	-8.56-35	4.82-35	3.12-34	7.14-34	1.29-33	2.10-33	3.25-33	4.94-33
26	1.30-29	-1.19-36	-1.01-35	-3.21-35	-7.33-35	-1.19-34	-1.02-34	4.98-35	3.55-34	8.28-34	1.51-33	2.50-33	3.95-33	6.12-33
25	1.46-29	-1.37-36	-1.16-35	-3.68-35	-8.47-35	-1.39-34	-1.23-34	5.03-35	4.07-34	9.69-34	1.80-33	3.03-33	4.89-33	7.75-33
24	1.66-29	-1.58-36	-1.33-35	-4.26-35	-9.87-35	-1.64-34	-1.49-34	4.87-35	4.68-34	1.15-33	2.17-33	3.74-33	6.17-33	1.01-32
23	1.89-29	-1.84-36	-1.54-35	-4.96-35	-1.16-34	-1.96-34	-1.84-34	4.37-35	5.43-34	1.37-33	2.66-33	4.70-33	7.99-33	1.35-32
22	2.16-29	-2.16-36	-1.80-35	-5.83-35	-1.38-34	-2.36-34	-2.31-34	3.26-35	6.33-34	1.66-33	3.33-33	6.05-33	1.07-32	1.89-32
21	2.50-29	-2.55-36	-2.13-35	-6.93-35	-1.66-34	-2.90-34	-2.95-34	1.14-35	7.44-34	2.05-33	4.25-33	8.03-33	1.48-32	2.79-32
20	2.90-29	-3.06-36	-2.53-35	-8.34-35	-2.02-34	-3.61-34	-3.85-34	-2.76-35	8.80-34	2.57-33	5.58-33	1.11-32	2.18-32	4.44-32
19	3.40-29	-3.70-36	-3.05-35	-1.02-34	-2.51-34	-4.58-34	-5.15-34	-9.87-35	1.04-33	3.31-33	7.60-33	1.61-32	3.43-32	7.88-32
18	4.01-29	-4.55-36	-3.73-35	-1.26-34	-3.16-34	-5.95-34	-7.08-34	-2.29-34	1.24-33	4.37-33	1.08-32	2.50-32	6.03-32	1.67-31
17	4.79-29	-5.66-36	-4.62-35	-1.58-34	-4.08-34	-7.93-34	-1.01-33	-4.73-34	1.45-33	5.98-33	1.65-32	4.32-32	1.26-31	4.88-31
16	5.79-29	-7.17-36	-5.84-35	-2.04-34	-5.39-34	-1.09-33	-1.50-33	-9.49-34	1.60-33	8.55-33	2.75-32	8.80-32	3.61-31	3.13-30
15	7.08-29	-9.25-36	-7.51-35	-2.68-34	-7.35-34	-1.57-33	-2.34-33	-1.94-33	1.47-33	1.30-32	5.31-32	2.43-31	2.25-30	
14	8.80-29	-1.21-35	-9.90-35	-3.64-34	-1.04-33	-2.36-33	-3.92-33	-4.17-33	1.19-34	2.12-32	1.35-31	1.43-30		
13	1.11-28	-1.63-35	-1.34-34	-5.10-34	-1.54-33	-3.78-33	-7.14-33	-9.89-33	-6.75-33	3.71-32	6.88-31			
12	1.44-28	-2.21-35	-1.86-34	-7.43-34	-2.41-33	-6.57-33	-1.47-32	-2.77-32	-4.72-32	1.73-32				
11	1.91-28	-3.03-35	-2.65-34	-1.13-33	-4.03-33	-1.27-32	-3.62-32	-1.07-31	-5.38-31					
10	2.61-28	-4.05-35	-3.83-34	-1.79-33	-7.33-33	-2.90-32	-1.22-31	-8.81-31						
9	3.71-28	-4.92-35	-5.50-34	-2.94-33	-1.49-32	-8.59-32	-8.60-31							
8	5.57-28	-4.35-35	-7.46-34	-4.94-33	-3.61-32	-4.91-31								
7	8.99-28	4.23-37	-9.41-34	-9.16-33	-1.55-31									
6	1.62-27	1.27-34	-1.27-33	-3.06-32										
5	3.46-27	5.79-34	-2.39-33											
4	1.03-26	4.06-33												
3	7.50-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.60-34	5.86-34	7.38-34	9.21-34	1.14-33	1.41-33	1.73-33	2.11-33	2.59-33	3.16-33	3.86-33	4.72-33	5.79-33	7.11-33
45	6.83-34	8.81-34	1.12-33	1.42-33	1.79-33	2.25-33	2.81-33	3.52-33	4.40-33	5.51-33	6.93-33	8.75-33	1.11-32	1.42-32
40	1.09-33	1.43-33	1.86-33	2.41-33	3.11-33	4.01-33	5.18-33	6.70-33	8.71-33	1.14-32	1.51-32	2.01-32	2.72-32	3.75-32
35	1.93-33	2.62-33	3.52-33	4.71-33	6.37-33	8.62-33	1.18-32	1.62-32	2.27-32	3.24-32	4.75-32	7.19-32	1.13-31	1.90-31
30	4.10-33	5.86-33	8.40-33	1.21-32	1.78-32	2.67-32	4.12-32	6.61-32	1.12-31	2.06-31	4.24-31	1.04-30	3.60-30	2.75-29
29	4.93-33	7.16-33	1.05-32	1.55-32	2.33-32	3.62-32	5.85-32	9.97-32	1.84-31	3.79-31	9.38-31	3.23-30	2.48-29	
28	6.01-33	8.90-33	1.33-32	2.02-32	3.16-32	5.14-32	8.81-32	1.63-31	3.37-31	8.37-31	2.90-30	2.22-29		
27	7.46-33	1.13-32	1.74-32	2.74-32	4.48-32	7.73-32	1.44-31	2.98-31	7.44-31	2.58-30	1.99-29			
26	9.46-33	1.48-32	2.35-32	3.88-32	6.72-32	1.26-31	2.63-31	6.56-31	2.29-30	1.77-29				
25	1.23-32	1.99-32	3.32-32	5.80-32	1.09-31	2.29-31	5.76-31	2.01-30	1.56-29					
24	1.66-32	2.80-32	4.95-32	9.39-32	1.99-31	5.02-31	1.76-30	1.37-29						
23	2.33-32	4.17-32	7.99-32	1.70-31	4.34-31	1.53-30	1.20-29							
22	3.45-32	6.70-32	1.45-31	3.71-31	1.32-30	1.04-29								
21	5.52-32	1.21-31	3.13-31	1.12-30	8.90-30									
20	9.89-32	2.60-31	9.44-31	7.54-30										
19	2.12-31	7.78-31	6.29-30											
18	6.27-31	5.14-30												
17	4.10-30													

H TE = 7.50+03 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 3.271-13 4-2 RC = 3.863-14 4-2 EM = 1.579-25 2S RC = 1.020-13 2P RC = 2.251-13

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.42-04	2.06-04	9.26-05	4.99-05	3.01-05	1.96-05	1.35-05	9.72-06	7.23-06	5.53-06	4.33-06	3.45-06	2.79-06	2.30-06
45	7.95-04	2.60-04	1.20-04	6.56-05	4.01-05	2.64-05	1.84-05	1.33-05	9.98-06	7.67-06	6.02-06	4.82-06	3.92-06	3.22-06
40	1.02-03	3.41-04	1.61-04	9.02-05	5.60-05	3.74-05	2.62-05	1.91-05	1.44-05	1.11-05	8.76-06	7.03-06	5.72-06	4.72-06
35	1.39-03	4.76-04	2.30-04	1.31-04	8.29-05	5.58-05	3.95-05	2.90-05	2.19-05	1.69-05	1.34-05	1.07-05	8.76-06	7.23-06
30	2.07-03	7.22-04	3.57-04	2.07-04	1.31-04	8.91-05	6.33-05	4.66-05	3.53-05	2.73-05	2.16-05	1.74-05	1.42-05	1.17-05
29	2.27-03	7.94-04	3.94-04	2.28-04	1.46-04	9.88-05	7.02-05	5.17-05	3.91-05	3.04-05	2.40-05	1.93-05	1.57-05	1.30-05
28	2.50-03	8.78-04	4.36-04	2.54-04	1.62-04	1.10-04	7.81-05	5.75-05	4.36-05	3.38-05	2.67-05	2.15-05	1.75-05	1.44-05
27	2.77-03	9.74-04	4.85-04	2.83-04	1.80-04	1.23-04	8.72-05	6.43-05	4.87-05	3.78-05	2.99-05	2.40-05	1.96-05	1.61-05
26	3.08-03	1.09-03	5.43-04	3.16-04	2.02-04	1.38-04	9.79-05	7.21-05	5.47-05	4.24-05	3.35-05	2.69-05	2.20-05	1.81-05
25	3.44-03	1.22-03	6.09-04	3.56-04	2.28-04	1.55-04	1.10-04	8.13-05	6.16-05	4.78-05	3.78-05	3.04-05	2.47-05	2.04-05
24	3.87-03	1.37-03	6.88-04	4.02-04	2.57-04	1.75-04	1.25-04	9.20-05	6.98-05	5.41-05	4.28-05	3.44-05	2.80-05	2.31-05
23	4.38-03	1.56-03	7.81-04	4.57-04	2.93-04	1.99-04	1.42-04	1.05-04	7.95-05	6.16-05	4.87-05	3.91-05	3.18-05	2.62-05
22	4.98-03	1.77-03	8.91-04	5.22-04	3.35-04	2.28-04	1.63-04	1.20-04	9.10-05	7.06-05	5.58-05	4.48-05	3.64-05	2.99-05
21	5.71-03	2.04-03	1.02-03	6.00-04	3.85-04	2.63-04	1.87-04	1.38-04	1.05-04	8.13-05	6.43-05	5.15-05	4.19-05	3.44-05
20	6.60-03	2.35-03	1.18-03	6.95-04	4.46-04	3.04-04	2.17-04	1.60-04	1.22-04	9.43-05	7.45-05	5.97-05	4.84-05	3.96-05
19	7.68-03	2.74-03	1.38-03	8.11-04	5.21-04	3.56-04	2.54-04	1.87-04	1.42-04	1.10-04	8.70-05	6.97-05	5.64-05	4.59-05
18	9.01-03	3.22-03	1.62-03	9.55-04	6.14-04	4.19-04	2.99-04	2.21-04	1.68-04	1.30-04	1.02-04	8.18-05	6.59-05	5.32-05
17	1.07-02	3.82-03	1.93-03	1.13-03	7.30-04	4.99-04	3.56-04	2.63-04	2.00-04	1.55-04	1.22-04	9.67-05	7.73-05	6.11-05
16	1.28-02	4.58-03	2.31-03	1.36-03	8.78-04	6.01-04	4.29-04	3.17-04	2.40-04	1.86-04	1.46-04	1.15-04	8.99-05	6.64-05
15	1.55-02	5.56-03	2.81-03	1.66-03	1.07-03	7.32-04	5.23-04	3.87-04	2.93-04	2.25-04	1.75-04	1.36-04	9.91-05	
14	1.91-02	6.83-03	3.46-03	2.05-03	1.32-03	9.05-04	6.47-04	4.78-04	3.61-04	2.76-04	2.11-04	1.52-04		
13	2.38-02	8.54-03	4.34-03	2.57-03	1.66-03	1.14-03	8.14-04	5.99-04	4.50-04	3.38-04	2.41-04			
12	3.03-02	1.09-02	5.53-03	3.28-03	2.12-03	1.46-03	1.04-03	7.64-04	5.64-04	3.96-04				
11	3.93-02	1.41-02	7.22-03	4.29-03	2.79-03	1.91-03	1.36-03	9.83-04	6.79-04					
10	5.25-02	1.89-02	9.68-03	5.78-03	3.76-03	2.58-03	1.81-03	1.23-03						
9	7.23-02	2.61-02	1.34-02	8.05-03	5.24-03	3.56-03	2.36-03							
8	1.04-01	3.76-02	1.95-02	1.17-02	7.59-03	4.89-03								
7	1.57-01	5.72-02	2.99-02	1.80-02	1.12-02									
6	2.56-01	9.39-02	4.94-02	2.89-02										
5	4.65-01	1.72-01	8.93-02											
4	1.00+00	3.66-01												
3	2.93+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.91-06	1.61-06	1.36-06	1.17-06	1.01-06	8.74-07	7.64-07	6.71-07	5.93-07	5.26-07	4.69-07	4.20-07	3.78-07	3.41-07
45	2.69-06	2.26-06	1.92-06	1.65-06	1.42-06	1.24-06	1.08-06	9.51-07	8.41-07	7.46-07	6.66-07	5.96-07	5.35-07	4.82-07
40	3.94-06	3.32-06	2.82-06	2.42-06	2.09-06	1.82-06	1.59-06	1.40-06	1.23-06	1.09-06	9.74-07	8.71-07	7.81-07	7.03-07
35	6.04-06	5.09-06	4.32-06	3.71-06	3.20-06	2.77-06	2.42-06	2.12-06	1.87-06	1.66-06	1.47-06	1.31-06	1.17-06	1.04-06
30	9.75-06	8.21-06	6.97-06	5.96-06	5.13-06	4.44-06	3.86-06	3.37-06	2.95-06	2.59-06	2.27-06	1.98-06	1.70-06	1.37-06
29	1.08-05	9.10-06	7.72-06	6.60-06	5.68-06	4.91-06	4.26-06	3.71-06	3.24-06	2.83-06	2.45-06	2.10-06	1.69-06	
28	1.20-05	1.01-05	8.59-06	7.33-06	6.30-06	5.44-06	4.71-06	4.09-06	3.55-06	3.07-06	2.62-06	2.10-06		
27	1.34-05	1.13-05	9.58-06	8.17-06	7.01-06	6.04-06	5.21-06	4.50-06	3.88-06	3.29-06	2.62-06			
26	1.51-05	1.27-05	1.07-05	9.13-06	7.81-06	6.71-06	5.77-06	4.94-06	4.17-06	3.31-06				
25	1.70-05	1.42-05	1.20-05	1.02-05	8.73-06	7.46-06	6.35-06	5.33-06	4.21-06					
24	1.92-05	1.61-05	1.36-05	1.15-05	9.75-06	8.26-06	6.89-06	5.42-06						
23	2.18-05	1.82-05	1.53-05	1.29-05	1.09-05	9.01-06	7.04-06							
22	2.48-05	2.07-05	1.73-05	1.45-05	1.19-05	9.27-06								
21	2.84-05	2.36-05	1.96-05	1.60-05	1.23-05									
20	3.26-05	2.68-05	2.18-05	1.67-05										
19	3.74-05	3.02-05	2.29-05											
18	4.25-05	3.20-05												
17	4.56-05													

H TE = 7.50+03 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.90-37	1.53-37	1.01-37	4.30-38	8.69-38	4.64-37	1.57-36	4.02-36	8.69-36	1.68-35	3.01-35	5.09-35	8.21-35
45	0.00+00	2.78-37	2.81-37	3.30-37	4.59-37	8.17-37	1.69-36	3.55-36	7.12-36	1.34-35	2.39-35	4.05-35	6.60-35	1.04-34
40	0.00+00	4.15-37	4.85-37	7.03-37	1.13-36	1.96-36	3.51-36	6.31-36	1.11-35	1.90-35	3.16-35	5.09-35	7.99-35	1.23-34
35	0.00+00	6.32-37	8.03-37	1.28-36	2.15-36	3.64-36	6.10-36	1.01-35	1.62-35	2.56-35	3.98-35	6.06-35	9.11-35	1.35-34
30	0.00+00	1.01-36	1.33-36	2.22-36	3.79-36	6.35-36	1.03-35	1.61-35	2.45-35	3.63-35	5.26-35	7.51-35	1.06-34	1.47-34
29	0.00+00	1.11-36	1.48-36	2.48-36	4.26-36	7.14-36	1.15-35	1.79-35	2.71-35	3.97-35	5.69-35	8.01-35	1.11-34	1.50-34
28	0.00+00	1.24-36	1.65-36	2.78-36	4.80-36	8.05-36	1.30-35	2.01-35	3.02-35	4.39-35	6.23-35	8.63-35	1.17-34	1.55-34
27	0.00+00	1.38-36	1.85-36	3.14-36	5.44-36	9.13-36	1.47-35	2.28-35	3.40-35	4.92-35	6.91-35	9.43-35	1.25-34	1.59-34
26	0.00+00	1.55-36	2.08-36	3.55-36	6.18-36	1.04-35	1.68-35	2.60-35	3.88-35	5.59-35	7.78-35	1.05-34	1.35-34	1.64-34
25	0.00+00	1.74-36	2.36-36	4.04-36	7.08-36	1.20-35	1.94-35	3.01-35	4.49-35	6.44-35	8.92-35	1.18-34	1.48-34	1.68-34
24	0.00+00	1.97-36	2.68-36	4.63-36	8.16-36	1.39-35	2.26-35	3.52-35	5.26-35	7.56-35	1.04-34	1.36-34	1.64-34	1.67-34
23	0.00+00	2.25-36	3.07-36	5.34-36	9.49-36	1.63-35	2.67-35	4.18-35	6.28-35	9.03-35	1.24-34	1.59-34	1.82-34	1.51-34
22	0.00+00	2.58-36	3.54-36	6.21-36	1.11-35	1.93-35	3.18-35	5.03-35	7.61-35	1.10-34	1.51-34	1.90-34	2.00-34	9.86-35
21	0.00+00	2.98-36	4.12-36	7.28-36	1.32-35	2.31-35	3.86-35	6.16-35	9.42-35	1.37-34	1.88-34	2.30-34	2.08-34	-5.66-35
20	0.00+00	3.47-36	4.83-36	8.63-36	1.58-35	2.80-35	4.75-35	7.69-35	1.19-34	1.75-34	2.39-34	2.79-34	1.74-34	-5.11-34
19	0.00+00	4.08-36	5.72-36	1.03-35	1.92-35	3.46-35	5.95-35	9.81-35	1.55-34	2.30-34	3.12-34	3.30-34	-1.05-35	-1.97-33
18	0.00+00	4.84-36	6.85-36	1.26-35	2.37-35	4.34-35	7.63-35	1.28-34	2.07-34	3.12-34	4.14-34	3.39-34	-7.75-34	-7.68-33
17	0.00+00	5.81-36	8.31-36	1.55-35	2.98-35	5.58-35	1.00-34	1.73-34	2.86-34	4.38-34	5.48-34	9.07-35	-4.23-33	-4.01-32
16	0.00+00	7.06-36	1.02-35	1.94-35	3.82-35	7.35-35	1.36-34	2.43-34	4.14-34	6.37-34	6.51-34	-1.63-33	-2.60-32	-4.85-31
15	0.00+00	8.70-36	1.28-35	2.48-35	5.03-35	1.00-34	1.93-34	3.59-34	6.33-34	9.47-34	1.73-34	-1.49-32	-3.54-31	
14	0.00+00	1.09-35	1.63-35	3.26-35	6.84-35	1.42-34	2.87-34	5.64-34	1.03-33	1.28-33	-6.49-33	-2.41-31		
13	0.00+00	1.39-35	2.14-35	4.42-35	9.69-35	2.12-34	4.58-34	9.68-34	1.80-33	-7.53-34	-1.49-31			
12	0.00+00	1.82-35	2.88-35	6.23-35	1.45-34	3.41-34	8.09-34	1.88-33	2.68-33	-7.86-32				
11	0.00+00	2.46-35	4.03-35	9.25-35	2.33-34	6.11-34	1.66-33	4.23-33	-2.84-32					
10	0.00+00	3.44-35	5.94-35	1.48-34	4.19-34	1.29-33	4.39-33	2.66-33						
9	0.00+00	5.05-35	9.35-35	2.63-34	8.95-34	3.69-33	1.75-32							
8	0.00+00	7.91-35	1.63-34	5.55-34	2.63-33	2.05-32								
7	0.00+00	1.36-34	3.34-34	1.62-33	1.66-32									
6	0.00+00	2.73-34	9.25-34	1.04-32										
5	0.00+00	7.21-34	5.45-33											
4	0.00+00	3.70-33												
3	0.00+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.28-34	1.93-34	2.85-34	4.11-34	5.85-34	8.21-34	1.14-33	1.56-33	2.13-33	2.88-33	3.89-33	5.22-33	6.99-33	9.35-33
45	1.59-34	2.38-34	3.50-34	5.06-34	7.21-34	1.02-33	1.42-33	1.98-33	2.73-33	3.77-33	5.18-33	7.13-33	9.82-33	1.36-32
40	1.85-34	2.74-34	4.00-34	5.78-34	8.29-34	1.18-33	1.68-33	2.37-33	3.36-33	4.77-33	6.79-33	9.73-33	1.41-32	2.06-32
35	1.98-34	2.89-34	4.19-34	6.04-34	8.71-34	1.26-33	1.82-33	2.65-33	3.89-33	5.80-33	8.79-33	1.37-32	2.20-32	3.71-32
30	2.02-34	2.75-34	3.72-34	4.99-34	6.61-34	8.59-34	1.08-33	1.24-33	1.09-33	-1.78-34	-5.50-33	-2.73-32	-1.39-31	-1.24-30
29	2.01-34	2.64-34	3.39-34	4.20-34	4.89-34	4.90-34	2.77-34	-5.58-34	-3.23-33	-1.18-32	-4.32-32	-1.97-31	-1.76-30	
28	1.99-34	2.45-34	2.83-34	2.83-34	1.72-34	-2.31-34	-1.41-33	-4.78-33	-1.50-32	-5.11-32	-2.26-31	-2.05-30		
27	1.93-34	2.12-34	1.84-34	3.20-35	-4.37-34	-1.73-33	-5.30-33	-1.59-32	-5.33-32	-2.35-31	-2.16-30			
26	1.80-34	1.51-34	2.53-36	-4.50-34	-1.69-33	-5.13-33	-1.54-32	-5.17-32	-2.30-31	-2.15-30				
25	1.52-34	3.42-35	-3.51-34	-1.44-33	-4.53-33	-1.39-32	-4.76-32	-2.15-31	-2.07-30					
24	9.15-35	-2.02-34	-1.09-33	-3.71-33	-1.19-32	-4.20-32	-1.95-31	-1.93-30						
23	-4.31-35	-7.15-34	-2.82-33	-9.68-33	-3.57-32	-1.72-31	-1.75-30							
22	-3.58-34	-1.94-33	-7.44-33	-2.92-32	-1.47-31	-1.56-30								
21	-1.16-33	-5.35-33	-2.29-32	-1.22-31	-1.36-30									
20	-3.50-33	-1.71-32	-9.84-32	-1.17-30										
19	-1.20-32	-7.66-32	-9.78-31											
18	-5.70-32	-7.99-31												
17	-6.34-31													

H TE = 7.50+03 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 3.276-13 4-2 RC = 3.872-14 4-2 EM = 1.582-25 2S RC = 1.023-13 2P RC = 2.253-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.04-04	2.49-04	1.08-04	5.62-05	3.30-05	2.10-05	1.42-05	1.01-05	7.39-06	5.59-06	4.33-06	3.42-06	2.75-06	2.24-06
45	1.03-03	3.22-04	1.40-04	7.37-05	4.35-05	2.78-05	1.89-05	1.34-05	9.88-06	7.48-06	5.80-06	4.60-06	3.70-06	3.02-06
40	1.35-03	4.26-04	1.88-04	9.99-05	5.95-05	3.84-05	2.62-05	1.88-05	1.39-05	1.06-05	8.22-06	6.53-06	5.27-06	4.32-06
35	1.79-03	5.76-04	2.61-04	1.41-04	8.54-05	5.58-05	3.86-05	2.78-05	2.07-05	1.58-05	1.24-05	9.89-06	8.02-06	6.59-06
30	2.47-03	8.19-04	3.83-04	2.13-04	1.32-04	8.75-05	6.12-05	4.45-05	3.34-05	2.58-05	2.03-05	1.62-05	1.32-05	1.09-05
29	2.66-03	8.88-04	4.18-04	2.34-04	1.45-04	9.68-05	6.79-05	4.95-05	3.72-05	2.87-05	2.26-05	1.81-05	1.47-05	1.21-05
28	2.88-03	9.67-04	4.59-04	2.58-04	1.61-04	1.08-04	7.56-05	5.52-05	4.16-05	3.21-05	2.53-05	2.02-05	1.65-05	1.36-05
27	3.13-03	1.06-03	5.06-04	2.86-04	1.79-04	1.20-04	8.46-05	6.19-05	4.66-05	3.60-05	2.84-05	2.27-05	1.85-05	1.52-05
26	3.43-03	1.17-03	5.61-04	3.19-04	2.01-04	1.35-04	9.51-05	6.96-05	5.25-05	4.06-05	3.20-05	2.56-05	2.08-05	1.72-05
25	3.77-03	1.29-03	6.25-04	3.58-04	2.26-04	1.52-04	1.07-04	7.87-05	5.94-05	4.59-05	3.62-05	2.90-05	2.36-05	1.94-05
24	4.18-03	1.44-03	7.02-04	4.03-04	2.55-04	1.72-04	1.22-04	8.94-05	6.75-05	5.22-05	4.12-05	3.30-05	2.68-05	2.20-05
23	4.66-03	1.61-03	7.92-04	4.57-04	2.90-04	1.96-04	1.39-04	1.02-04	7.71-05	5.96-05	4.70-05	3.76-05	3.06-05	2.51-05
22	5.24-03	1.83-03	9.01-04	5.21-04	3.32-04	2.25-04	1.59-04	1.17-04	8.85-05	6.85-05	5.39-05	4.32-05	3.50-05	2.87-05
21	5.95-03	2.08-03	1.03-03	5.99-04	3.82-04	2.59-04	1.84-04	1.35-04	1.02-04	7.90-05	6.23-05	4.98-05	4.04-05	3.30-05
20	6.80-03	2.39-03	1.19-03	6.93-04	4.43-04	3.01-04	2.14-04	1.57-04	1.19-04	9.18-05	7.23-05	5.78-05	4.67-05	3.82-05
19	7.86-03	2.77-03	1.39-03	8.09-04	5.17-04	3.52-04	2.50-04	1.84-04	1.39-04	1.07-04	8.45-05	6.74-05	5.44-05	4.42-05
18	9.17-03	3.25-03	1.63-03	9.52-04	6.09-04	4.15-04	2.95-04	2.17-04	1.64-04	1.27-04	9.95-05	7.92-05	6.36-05	5.12-05
17	1.08-02	3.84-03	1.93-03	1.13-03	7.25-04	4.94-04	3.51-04	2.59-04	1.95-04	1.51-04	1.18-04	9.36-05	7.45-05	5.88-05
16	1.29-02	4.60-03	2.31-03	1.36-03	8.72-04	5.94-04	4.23-04	3.11-04	2.35-04	1.81-04	1.41-04	1.11-04	8.66-05	6.41-05
15	1.56-02	5.57-03	2.81-03	1.65-03	1.06-03	7.24-04	5.16-04	3.79-04	2.86-04	2.19-04	1.70-04	1.31-04	9.56-05	
14	1.91-02	6.85-03	3.46-03	2.04-03	1.31-03	8.95-04	6.38-04	4.69-04	3.52-04	2.68-04	2.03-04	1.47-04		
13	2.39-02	8.55-03	4.33-03	2.56-03	1.65-03	1.12-03	8.01-04	5.87-04	4.38-04	3.27-04	2.32-04			
12	3.03-02	1.09-02	5.52-03	3.27-03	2.11-03	1.44-03	1.02-03	7.46-04	5.47-04	3.82-04				
11	3.94-02	1.42-02	7.21-03	4.27-03	2.76-03	1.89-03	1.33-03	9.56-04	6.57-04					
10	5.25-02	1.89-02	9.66-03	5.74-03	3.72-03	2.53-03	1.77-03	1.19-03						
9	7.24-02	2.61-02	1.34-02	8.00-03	5.17-03	3.49-03	2.29-03							
8	1.04-01	3.76-02	1.94-02	1.16-02	7.46-03	4.76-03								
7	1.57-01	5.72-02	2.97-02	1.78-02	1.09-02									
6	2.56-01	9.37-02	4.91-02	2.83-02										
5	4.65-01	1.71-01	8.79-02											
4	1.00+00	3.63-01												
3	2.92+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.85-06	1.55-06	1.31-06	1.11-06	9.58-07	8.29-07	7.22-07	6.33-07	5.58-07	4.94-07	4.40-07	3.93-07	3.53-07	3.17-07
45	2.50-06	2.09-06	1.77-06	1.51-06	1.30-06	1.12-06	9.81-07	8.60-07	7.58-07	6.72-07	5.98-07	5.34-07	4.79-07	4.32-07
40	3.58-06	3.00-06	2.54-06	2.17-06	1.87-06	1.62-06	1.41-06	1.24-06	1.09-06	9.70-07	8.64-07	7.72-07	6.92-07	6.23-07
35	5.48-06	4.61-06	3.91-06	3.34-06	2.88-06	2.50-06	2.18-06	1.91-06	1.69-06	1.49-06	1.33-06	1.18-06	1.06-06	9.49-07
30	9.04-06	7.60-06	6.45-06	5.52-06	4.75-06	4.11-06	3.58-06	3.13-06	2.75-06	2.41-06	2.12-06	1.86-06	1.60-06	1.30-06
29	1.01-05	8.48-06	7.19-06	6.15-06	5.29-06	4.58-06	3.98-06	3.47-06	3.04-06	2.66-06	2.32-06	1.99-06	1.61-06	
28	1.13-05	9.49-06	8.04-06	6.87-06	5.90-06	5.10-06	4.43-06	3.85-06	3.35-06	2.91-06	2.49-06	2.01-06		
27	1.27-05	1.06-05	9.02-06	7.69-06	6.60-06	5.69-06	4.92-06	4.26-06	3.68-06	3.13-06	2.52-06			
26	1.43-05	1.20-05	1.01-05	8.64-06	7.40-06	6.36-06	5.47-06	4.70-06	3.98-06	3.18-06				
25	1.61-05	1.35-05	1.14-05	9.72-06	8.29-06	7.09-06	6.05-06	5.10-06	4.05-06					
24	1.83-05	1.53-05	1.29-05	1.09-05	9.30-06	7.88-06	6.60-06	5.22-06						
23	2.08-05	1.74-05	1.46-05	1.23-05	1.04-05	8.64-06	6.79-06							
22	2.38-05	1.98-05	1.66-05	1.39-05	1.14-05	8.93-06								
21	2.73-05	2.26-05	1.87-05	1.54-05	1.19-05									
20	3.13-05	2.57-05	2.09-05	1.61-05										
19	3.60-05	2.90-05	2.21-05											
18	4.09-05	3.09-05												
17	4.40-05													

H TE = 7.50+03 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.54-37	7.35-39	-3.06-37	-8.63-37	-1.64-36	-2.50-36	-3.10-36	-2.87-36	-9.10-37	4.07-36	1.39-35	3.10-35	5.88-35
45	0.00+00	2.28-37	7.46-38	-2.36-37	-7.58-37	-1.39-36	-1.84-36	-1.51-36	5.91-37	5.96-36	1.68-35	3.63-35	6.88-35	1.20-34
40	0.00+00	3.53-37	2.16-37	-3.44-38	-4.11-37	-7.03-37	-4.01-37	1.44-36	6.36-36	1.67-35	3.61-35	6.96-35	1.24-34	2.11-34
35	0.00+00	5.78-37	5.24-37	4.93-37	5.52-37	1.08-36	2.86-36	7.31-36	1.67-35	3.46-35	6.62-35	1.20-34	2.07-34	3.45-34
30	0.00+00	9.92-37	1.14-36	1.63-36	2.64-36	4.77-36	9.13-36	1.76-35	3.32-35	6.09-35	1.08-34	1.87-34	3.15-34	5.22-34
29	0.00+00	1.11-36	1.32-36	1.96-36	3.25-36	5.82-36	1.09-35	2.03-35	3.74-35	6.71-35	1.18-34	2.01-34	3.38-34	5.61-34
28	0.00+00	1.25-36	1.52-36	2.33-36	3.93-36	7.00-36	1.28-35	2.33-35	4.18-35	7.37-35	1.27-34	2.16-34	3.62-34	6.00-34
27	0.00+00	1.40-36	1.75-36	2.76-36	4.71-36	8.33-36	1.49-35	2.66-35	4.67-35	8.08-35	1.38-34	2.32-34	3.86-34	6.40-34
26	0.00+00	1.58-36	2.02-36	3.25-36	5.59-36	9.84-36	1.73-35	3.02-35	5.21-35	8.86-35	1.49-34	2.48-34	4.11-34	6.81-34
25	0.00+00	1.78-36	2.32-36	3.80-36	6.61-36	1.16-35	2.01-35	3.45-35	5.82-35	9.73-35	1.61-34	2.66-34	4.37-34	7.23-34
24	0.00+00	2.02-36	2.67-36	4.45-36	7.78-36	1.36-35	2.33-35	3.94-35	6.55-35	1.07-34	1.75-34	2.85-34	4.65-34	7.64-34
23	0.00+00	2.30-36	3.08-36	5.20-36	9.16-36	1.60-35	2.72-35	4.54-35	7.42-35	1.20-34	1.92-34	3.07-34	4.93-34	8.00-34
22	0.00+00	2.63-36	3.56-36	6.09-36	1.08-35	1.89-35	3.20-35	5.28-35	8.52-35	1.35-34	2.13-34	3.33-34	5.21-34	8.16-34
21	0.00+00	3.04-36	4.15-36	7.17-36	1.28-35	2.24-35	3.80-35	6.23-35	9.96-35	1.56-34	2.40-34	3.63-34	5.40-34	7.75-34
20	0.00+00	3.53-36	4.86-36	8.50-36	1.53-35	2.70-35	4.58-35	7.51-35	1.19-34	1.84-34	2.76-34	3.97-34	5.27-34	5.49-34
19	0.00+00	4.13-36	5.74-36	1.02-35	1.86-35	3.30-35	5.63-35	9.26-35	1.47-34	2.24-34	3.24-34	4.23-34	3.97-34	-3.20-34
18	0.00+00	4.89-36	6.86-36	1.23-35	2.28-35	4.11-35	7.09-35	1.18-34	1.87-34	2.81-34	3.85-34	3.97-34	-1.71-34	-3.90-33
17	0.00+00	5.85-36	8.30-36	1.52-35	2.85-35	5.22-35	9.18-35	1.54-34	2.47-34	3.67-34	4.50-34	1.32-34	-2.67-33	-2.38-32
16	0.00+00	7.10-36	1.02-35	1.90-35	3.65-35	6.83-35	1.23-34	2.12-34	3.44-34	4.95-34	4.38-34	-1.35-33	-1.75-32	-2.74-31
15	0.00+00	8.73-36	1.27-35	2.42-35	4.79-35	9.24-35	1.72-34	3.05-34	5.03-34	6.66-34	-1.71-34	-1.13-32	-2.16-31	
14	0.00+00	1.09-35	1.62-35	3.17-35	6.49-35	1.30-34	2.53-34	4.68-34	7.81-34	7.10-34	-5.89-33	-1.59-31		
13	0.00+00	1.40-35	2.12-35	4.29-35	9.16-35	1.93-34	3.98-34	7.81-34	1.25-33	-1.64-33	-1.07-31			
12	0.00+00	1.83-35	2.86-35	6.04-35	1.36-34	3.09-34	6.91-34	1.45-33	1.31-33	-6.28-32				
11	0.00+00	2.46-35	3.99-35	8.96-35	2.19-34	5.48-34	1.38-33	2.95-33	-2.75-32					
10	0.00+00	3.44-35	5.87-35	1.43-34	3.90-34	1.14-33	3.47-33	-2.77-33						
9	0.00+00	5.05-35	9.25-35	2.53-34	8.26-34	3.16-33	1.14-32							
8	0.00+00	7.92-35	1.61-34	5.32-34	2.39-33	1.62-32								
7	0.00+00	1.36-34	3.29-34	1.54-33	1.45-32									
6	0.00+00	2.73-34	9.07-34	9.69-33										
5	0.00+00	7.21-34	5.29-33											
4	0.00+00	3.69-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.02-34	1.65-34	2.56-34	3.85-34	5.63-34	8.04-34	1.13-33	1.56-33	2.13-33	2.87-33	3.82-33	5.05-33	6.62-33	8.60-33
45	1.99-34	3.15-34	4.84-34	7.25-34	1.06-33	1.54-33	2.19-33	3.08-33	4.30-33	5.96-33	8.22-33	1.13-32	1.54-32	2.11-32
40	3.44-34	5.43-34	8.37-34	1.27-33	1.89-33	2.79-33	4.07-33	5.92-33	8.58-33	1.24-32	1.80-32	2.62-32	3.85-32	5.70-32
35	5.60-34	8.91-34	1.39-33	2.16-33	3.31-33	5.07-33	7.76-33	1.19-32	1.85-32	2.90-32	4.63-32	7.61-32	1.29-31	2.32-31
30	8.54-34	1.39-33	2.24-33	3.63-33	5.93-33	9.80-33	1.66-32	2.89-32	5.28-32	1.03-31	2.24-31	5.78-31	2.05-30	1.60-29
29	9.21-34	1.51-33	2.46-33	4.05-33	6.73-33	1.14-32	2.00-32	3.66-32	7.16-32	1.55-31	3.99-31	1.41-30	1.09-29	
28	9.90-34	1.63-33	2.70-33	4.51-33	7.69-33	1.35-32	2.47-32	4.83-32	1.04-31	2.66-31	9.32-31	7.17-30		
27	1.06-33	1.76-33	2.96-33	5.06-33	8.87-33	1.62-32	3.16-32	6.78-32	1.71-31	5.92-31	4.49-30			
26	1.13-33	1.90-33	3.25-33	5.68-33	1.03-32	2.00-32	4.24-32	1.05-31	3.56-31	2.64-30				
25	1.21-33	2.04-33	3.55-33	6.39-33	1.22-32	2.53-32	6.11-32	1.98-31	1.41-30					
24	1.27-33	2.17-33	3.82-33	7.06-33	1.41-32	3.22-32	9.63-32	6.15-31						
23	1.32-33	2.22-33	3.89-33	7.14-33	1.42-32	3 28-32	1.23-31							
22	1.29-33	2.02-33	3.04-33	3.64-33	-4.48-33	-1.68-31								
21	1.01-33	8.64-34	-1.91-33	-2.40-32	-3.22-31									
20	-9.03-35	-4.25-33	-3.20-32	-3.88-31										
19	-4.62-33	-3.28-32	-3.98-31											
18	-2.94-32	-3.73-31												
17	-3.28-31													

H TE = 7.50+03 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 3.286-13 4-2 RC = 3.887-14 4-2 EM = 1.589-25 2S RC = 1.029-13 2P RC = 2.257-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.85-04	3.02-04	1.30-04	6.75-05	3.94-05	2.50-05	1.68-05	1.19-05	8.68-06	6.54-06	5.05-06	3.98-06	3.19-06	2.60-06
45	1.25-03	3.84-04	1.65-04	8.58-05	5.02-05	3.18-05	2.14-05	1.51-05	1.11-05	8.35-06	6.45-06	5.08-06	4.08-06	3.32-06
40	1.63-03	5.03-04	2.17-04	1.13-04	6.61-05	4.20-05	2.83-05	2.00-05	1.47-05	1.11-05	8.55-06	6.75-06	5.42-06	4.41-06
35	2.24-03	6.94-04	3.01-04	1.57-04	9.25-05	5.90-05	3.99-05	2.83-05	2.08-05	1.57-05	1.21-05	9.60-06	7.71-06	6.29-06
30	3.21-03	1.01-03	4.43-04	2.34-04	1.39-04	8.94-05	6.09-05	4.34-05	3.20-05	2.43-05	1.89-05	1.50-05	1.21-05	9.88-06
29	3.46-03	1.09-03	4.82-04	2.56-04	1.52-04	9.82-05	6.70-05	4.79-05	3.54-05	2.69-05	2.09-05	1.66-05	1.34-05	1.10-05
28	3.74-03	1.18-03	5.26-04	2.80-04	1.67-04	1.08-04	7.41-05	5.30-05	3.92-05	2.99-05	2.33-05	1.85-05	1.49-05	1.22-05
27	4.04-03	1.29-03	5.75-04	3.08-04	1.85-04	1.20-04	8.23-05	5.90-05	4.37-05	3.33-05	2.60-05	2.07-05	1.67-05	1.37-05
26	4.38-03	1.40-03	6.31-04	3.40-04	2.05-04	1.33-04	9.18-05	6.60-05	4.90-05	3.74-05	2.92-05	2.33-05	1.88-05	1.54-05
25	4.76-03	1.54-03	6.95-04	3.77-04	2.28-04	1.49-04	1.03-04	7.43-05	5.53-05	4.23-05	3.31-05	2.63-05	2.13-05	1.75-05
24	5.18-03	1.69-03	7.70-04	4.20-04	2.56-04	1.68-04	1.16-04	8.41-05	6.28-05	4.81-05	3.77-05	3.00-05	2.43-05	1.99-05
23	5.67-03	1.86-03	8.58-04	4.72-04	2.89-04	1.91-04	1.33-04	9.60-05	7.17-05	5.50-05	4.31-05	3.44-05	2.79-05	2.28-05
22	6.25-03	2.07-03	9.62-04	5.33-04	3.29-04	2.18-04	1.52-04	1.10-04	8.26-05	6.34-05	4.97-05	3.97-05	3.21-05	2.63-05
21	6.94-03	2.31-03	1.09-03	6.07-04	3.77-04	2.50-04	1.75-04	1.28-04	9.57-05	7.36-05	5.77-05	4.60-05	3.73-05	3.05-05
20	7.76-03	2.61-03	1.24-03	6.98-04	4.35-04	2.91-04	2.04-04	1.49-04	1.12-04	8.59-05	6.74-05	5.38-05	4.34-05	3.54-05
19	8.77-03	2.97-03	1.43-03	8.09-04	5.07-04	3.40-04	2.39-04	1.75-04	1.31-04	1.01-04	7.93-05	6.31-05	5.09-05	4.13-05
18	1.00-02	3.42-03	1.66-03	9.49-04	5.98-04	4.02-04	2.84-04	2.07-04	1.56-04	1.20-04	9.39-05	7.45-05	5.98-05	4.81-05
17	1.16-02	3.99-03	1.95-03	1.12-03	7.11-04	4.80-04	3.39-04	2.48-04	1.86-04	1.43-04	1.12-04	8.84-05	7.03-05	5.55-05
16	1.36-02	4.72-03	2.33-03	1.35-03	8.56-04	5.79-04	4.09-04	2.99-04	2.25-04	1.72-04	1.34-04	1.05-04	8.20-05	6.08-05
15	1.62-02	5.67-03	2.82-03	1.64-03	1.04-03	7.07-04	5.00-04	3.66-04	2.74-04	2.09-04	1.61-04	1.24-04	9.08-05	
14	1.96-02	6.93-03	3.46-03	2.02-03	1.29-03	8.75-04	6.19-04	4.52-04	3.38-04	2.56-04	1.93-04	1.39-04		
13	2.43-02	8.61-03	4.32-03	2.53-03	1.62-03	1.10-03	7.77-04	5.66-04	4.19-04	3.12-04	2.21-04			
12	3.07-02	1.09-02	5.51-03	3.24-03	2.07-03	1.41-03	9.93-04	7.18-04	5.23-04	3.64-04				
11	3.97-02	1.42-02	7.18-03	4.23-03	2.71-03	1.85-03	1.29-03	9.17-04	6.26-04					
10	5.28-02	1.89-02	9.62-03	5.68-03	3.65-03	2.46-03	1.70-03	1.13-03						
9	7.26-02	2.61-02	1.33-02	7.90-03	5.06-03	3.37-03	2.19-03							
8	1.04-01	3.76-02	1.93-02	1.14-02	7.27-03	4.57-03								
7	1.58-01	5.71-02	2.95-02	1.74-02	1.05-02									
6	2.57-01	9.34-02	4.84-02	2.75-02										
5	4.66-01	1.70-01	8.59-02											
4	1.00+00	3.57-01												
3	2.90+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.15-06	1.79-06	1.51-06	1.29-06	1.10-06	9.53-07	8.29-07	7.26-07	6.39-07	5.66-07	5.03-07	4.49-07	4.03-07	3.62-07
45	2.74-06	2.29-06	1.93-06	1.64-06	1.41-06	1.22-06	1.06-06	9.29-07	8.17-07	7.23-07	6.43-07	5.74-07	5.15-07	4.63-07
40	3.64-06	3.04-06	2.57-06	2.19-06	1.88-06	1.62-06	1.41-06	1.24-06	1.09-06	9.62-07	8.55-07	7.63-07	6.83-07	6.14-07
35	5.20-06	4.35-06	3.67-06	3.12-06	2.68-06	2.32-06	2.02-06	1.77-06	1.55-06	1.37-06	1.22-06	1.09-06	9.70-07	8.69-07
30	8.18-06	6.84-06	5.78-06	4.93-06	4.23-06	3.66-06	3.18-06	2.78-06	2.44-06	2.14-06	1.89-06	1.66-06	1.43-06	1.17-06
29	9.07-06	7.60-06	6.42-06	5.48-06	4.70-06	4.06-06	3.53-06	3.08-06	2.70-06	2.36-06	2.06-06	1.78-06	1.45-06	
28	1.01-05	8.48-06	7.17-06	6.11-06	5.24-06	4.53-06	3.93-06	3.42-06	2.98-06	2.60-06	2.23-06	1.81-06		
27	1.13-05	9.51-06	8.04-06	6.85-06	5.88-06	5.07-06	4.39-06	3.81-06	3.30-06	2.82-06	2.28-06			
26	1.28-05	1.07-05	9.06-06	7.72-06	6.61-06	5.69-06	4.91-06	4.23-06	3.60-06	2.89-06				
25	1.45-05	1.21-05	1.03-05	8.73-06	7.46-06	6.40-06	5.48-06	4.64-06	3.71-06					
24	1.65-05	1.38-05	1.17-05	9.91-06	8.44-06	7.18-06	6.04-06	4.81-06						
23	1.89-05	1.58-05	1.33-05	1.13-05	9.52-06	7.95-06	6.29-06							
22	2.18-05	1.82-05	1.52-05	1.28-05	1.06-05	8.32-06								
21	2.52-05	2.09-05	1.74-05	1.43-05	1.11-05									
20	2.91-05	2.40-05	1.96-05	1.51-05										
19	3.37-05	2.72-05	2.08-05											
18	3.85-05	2.92-05												
17	4.17-05													

H TE = 7.50+03 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.14-37	-1.71-37	-8.62-37	-2.27-36	-4.74-36	-8.66-36	-1.45-35	-2.28-35	-3.43-35	-4.99-35	-7.07-35	-9.87-35	-1.36-34
45	0.00+00	1.80-37	-1.36-37	-8.81-37	-2.36-36	-4.85-36	-8.63-36	-1.39-35	-2.10-35	-2.99-35	-4.09-35	-5.43-35	-7.07-35	-9.12-35
40	0.00+00	2.90-37	-5.26-38	-8.26-37	-2.29-36	-4.58-36	-7.69-36	-1.13-35	-1.49-35	-1.74-35	-1.73-35	-1.24-35	1.48-37	2.38-35
35	0.00+00	4.80-37	1.09-37	-6.81-37	-2.08-36	-3.99-36	-5.90-36	-6.65-36	-4.19-36	4.85-36	2.56-35	6.59-35	1.37-34	2.54-34
30	0.00+00	8.48-37	4.99-37	-1.66-37	-1.21-36	-2.11-36	-1.50-36	3.36-36	1.73-35	4.85-35	1.10-34	2.23-34	4.21-34	7.56-34
29	0.00+00	9.61-37	6.40-37	5.41-38	-8.04-37	-1.30-36	2.01-37	6.89-36	2.45-35	6.26-35	1.37-34	2.74-34	5.15-34	9.26-34
28	0.00+00	1.09-36	8.13-37	3.41-37	-2.73-37	-2.43-37	2.34-36	1.12-35	3.31-35	7.95-35	1.69-34	3.34-34	6.27-34	1.13-33
27	0.00+00	1.25-36	1.03-36	7.08-37	4.16-37	1.10-36	5.01-36	1.65-35	4.34-35	9.94-35	2.07-34	4.06-34	7.62-34	1.39-33
26	0.00+00	1.44-36	1.29-36	1.17-36	1.30-36	2.80-36	8.30-36	2.29-35	5.57-35	1.23-34	2.52-34	4.92-34	9.26-34	1.70-33
25	0.00+00	1.66-36	1.61-36	1.75-36	2.40-36	4.91-36	1.23-35	3.05-35	7.01-35	1.50-34	3.05-34	5.94-34	1.12-33	2.09-33
24	0.00+00	1.92-36	2.00-36	2.47-36	3.77-36	7.49-36	1.71-35	3.95-35	8.70-35	1.82-34	3.67-34	7.14-34	1.36-33	2.58-33
23	0.00+00	2.23-36	2.47-36	3.35-36	5.45-36	1.06-35	2.29-35	5.01-35	1.07-34	2.20-34	4.39-34	8.58-34	1.66-33	3.21-33
22	0.00+00	2.60-36	3.04-36	4.43-36	7.50-36	1.44-35	2.98-35	6.25-35	1.29-34	2.63-34	5.23-34	1.03-33	2.03-33	4.04-33
21	0.00+00	3.04-36	3.72-36	5.73-36	9.98-36	1.90-35	3.81-35	7.73-35	1.56-34	3.13-34	6.23-34	1.24-33	2.50-33	5.16-33
20	0.00+00	3.57-36	4.53-36	7.30-36	1.30-35	2.46-35	4.80-35	9.48-35	1.88-34	3.73-34	7.42-34	1.50-33	3.11-33	6.77-33
19	0.00+00	4.22-36	5.53-36	9.22-36	1.67-35	3.14-35	6.01-35	1.16-34	2.26-34	4.44-34	8.89-34	1.83-33	3.95-33	9.21-33
18	0.00+00	5.01-36	6.75-36	1.16-35	2.13-35	3.99-35	7.53-35	1.43-34	2.74-34	5.35-34	1.07-33	2.26-33	5.11-33	1.31-32
17	0.00+00	6.00-36	8.27-36	1.46-35	2.71-35	5.10-35	9.54-35	1.79-34	3.38-34	6.54-34	1.31-33	2.81-33	6.60-33	1.84-32
16	0.00+00	7.26-36	1.02-35	1.84-35	3.49-35	6.60-35	1.23-34	2.30-34	4.30-34	8.20-34	1.61-33	3.25-33	6.03-33	-2.04-32
15	0.00+00	8.90-36	1.28-35	2.36-35	4.56-35	8.76-35	1.65-34	3.08-34	5.71-34	1.04-33	1.75-33	7.34-34	-5.92-32	
14	0.00+00	1.11-35	1.62-35	3.08-35	6.13-35	1.21-34	2.33-34	4.39-34	7.99-34	1.24-33	-6.02-34	-6.61-32		
13	0.00+00	1.41-35	2.11-35	4.15-35	8.57-35	1.75-34	3.52-34	6.80-34	1.15-33	-5.34-35	-5.61-32			
12	0.00+00	1.84-35	2.83-35	5.81-35	1.26-34	2.74-34	5.85-34	1.16-33	1.09-33	-3.90-32				
11	0.00+00	2.48-35	3.95-35	8.56-35	2.00-34	4.76-34	1.12-33	2.10-33	-2.05-32					
10	0.00+00	3.46-35	5.79-35	1.36-34	3.53-34	9.66-34	2.62-33	-4.43-33						
9	0.00+00	5.07-35	9.09-35	2.39-34	7.37-34	2.57-33	6.73-33							
8	0.00+00	7.94-35	1.58-34	4.99-34	2.08-33	1.20-32								
7	0.00+00	1.37-34	3.21-34	1.42-33	1.20-32									
6	0.00+00	2.74-34	8.80-34	8.68-33										
5	0.00+00	7.21-34	5.05-33											
4	0.00+00	3.68-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.87-34	-2.58-34	-3.56-34	-4.94-34	-6.91-34	-9.70-34	-1.37-33	-1.94-33	-2.75-33	-3.89-33	-5.49-33	-7.73-33	-1.09-32	-1.52-32
45	-1.18-34	-1.55-34	-2.09-34	-2.92-34	-4.22-34	-6.28-34	-9.53-34	-1.46-33	-2.26-33	-3.48-33	-5.34-33	-8.16-33	-1.24-32	-1.88-32
40	6.25-35	1.20-34	2.00-34	3.04-34	4.26-34	5.55-34	6.63-34	6.93-34	5.48-34	5.62-35	-1.08-33	-3.38-33	-7.75-33	-1.58-32
35	4.40-34	7.24-34	1.15-33	1.78-33	2.68-33	3.96-33	5.78-33	8.33-33	1.19-32	1.69-32	2.39-32	3.38-32	4.77-32	6.69-32
30	1.31-33	2.22-33	3.71-33	6.13-33	1.01-32	1.68-32	2.83-32	4.88-32	8.77-32	1.68-31	3.54-31	8.83-31	3.02-30	2.24-29
29	1.62-33	2.78-33	4.70-33	7.95-33	1.35-32	2.32-32	4.09-32	7.51-32	1.47-31	3.16-31	8.06-31	2.82-30	2.14-29	
28	2.00-33	3.48-33	6.02-33	1.04-32	1.83-32	3.30-32	6.17-32	1.23-31	2.70-31	7.00-31	2.49-30	1.93-29		
27	2.48-33	4.39-33	7.79-33	1.40-32	2.56-32	4.87-32	9.86-32	2.20-31	5.81-31	2.10-30	1.65-29			
26	3.09-33	5.60-33	1.02-32	1.91-32	3.70-32	7.60-32	1.72-31	4.61-31	1.68-30	1.34-29				
25	3.88-33	7.22-33	1.37-32	2.70-32	5.63-32	1.29-31	3.50-31	1.29-30	1.03-29					
24	4.91-33	9.48-33	1.89-32	4.00-32	9.29-32	2.54-31	9.42-31	7.53-30						
23	6.31-33	1.28-32	2.73-32	6.40-32	1.76-31	6.54-31	5.21-30							
22	8.28-33	1.79-32	4.21-32	1.16-31	4.31-31	3.40-30								
21	1.12-32	2.65-32	7.30-32	2.69-31	2.09-30									
20	1.60-32	4.36-32	1.58-31	1.19-30										
19	2.46-32	8.63-32	6.10-31											
18	4.28-32	2.66-31												
17	7.47-32													

H TE = 7.50+03 NE = 1.00+05 CASE B NC = 60

TOTAL RC = 3.304-13 4-2 RC = 3.913-14 4-2 EM = 1.599-25 2S RC = 1.039-13 2P RC = 2.265-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.14-03	3.49-04	1.50-04	7.78-05	4.54-05	2.87-05	1.93-05	1.36-05	9.97-06	7.51-06	5.79-06	4.57-06	3.66-06	2.98-06
45	1.51-03	4.62-04	1.99-04	1.03-04	6.01-05	3.81-05	2.56-05	1.81-05	1.32-05	9.94-06	7.67-06	6.04-06	4.85-06	3.94-06
40	2.02-03	6.19-04	2.66-04	1.38-04	8.05-05	5.10-05	3.43-05	2.42-05	1.77-05	1.33-05	1.03-05	8.11-06	6.50-06	5.29-06
35	2.73-03	8.40-04	3.61-04	1.87-04	1.09-04	6.94-05	4.67-05	3.29-05	2.41-05	1.81-05	1.40-05	1.10-05	8.85-06	7.20-06
30	3.84-03	1.18-03	5.10-04	2.65-04	1.55-04	9.84-05	6.63-05	4.68-05	3.43-05	2.58-05	1.99-05	1.57-05	1.26-05	1.03-05
29	4.15-03	1.28-03	5.52-04	2.87-04	1.68-04	1.07-04	7.20-05	5.08-05	3.72-05	2.80-05	2.17-05	1.71-05	1.37-05	1.11-05
28	4.51-03	1.39-03	6.00-04	3.12-04	1.83-04	1.16-04	7.84-05	5.54-05	4.06-05	3.06-05	2.36-05	1.86-05	1.50-05	1.22-05
27	4.91-03	1.52-03	6.56-04	3.42-04	2.00-04	1.27-04	8.60-05	6.08-05	4.45-05	3.36-05	2.60-05	2.05-05	1.64-05	1.34-05
26	5.37-03	1.66-03	7.20-04	3.75-04	2.20-04	1.40-04	9.48-05	6.70-05	4.92-05	3.71-05	2.87-05	2.26-05	1.82-05	1.48-05
25	5.90-03	1.83-03	7.94-04	4.15-04	2.44-04	1.55-04	1.05-04	7.44-05	5.46-05	4.12-05	3.19-05	2.52-05	2.02-05	1.65-05
24	6.50-03	2.02-03	8.79-04	4.60-04	2.71-04	1.73-04	1.17-04	8.31-05	6.10-05	4.61-05	3.57-05	2.82-05	2.26-05	1.84-05
23	7.18-03	2.24-03	9.78-04	5.14-04	3.03-04	1.94-04	1.32-04	9.35-05	6.87-05	5.20-05	4.03-05	3.18-05	2.56-05	2.08-05
22	7.96-03	2.49-03	1.09-03	5.76-04	3.41-04	2.19-04	1.49-04	1.06-04	7.80-05	5.91-05	4.58-05	3.62-05	2.91-05	2.37-05
21	8.84-03	2.78-03	1.23-03	6.50-04	3.87-04	2.49-04	1.70-04	1.21-04	8.92-05	6.77-05	5.25-05	4.16-05	3.34-05	2.72-05
20	9.86-03	3.12-03	1.39-03	7.39-04	4.41-04	2.85-04	1.95-04	1.39-04	1.03-04	7.83-05	6.08-05	4.82-05	3.87-05	3.15-05
19	1.10-02	3.52-03	1.58-03	8.46-04	5.08-04	3.30-04	2.27-04	1.62-04	1.20-04	9.15-05	7.12-05	5.64-05	4.52-05	3.67-05
18	1.24-02	3.99-03	1.81-03	9.78-04	5.92-04	3.86-04	2.66-04	1.91-04	1.42-04	1.08-04	8.42-05	6.66-05	5.33-05	4.30-05
17	1.40-02	4.57-03	2.09-03	1.14-03	6.97-04	4.57-04	3.17-04	2.28-04	1.70-04	1.29-04	1.01-04	7.94-05	6.32-05	5.00-05
16	1.61-02	5.29-03	2.45-03	1.35-03	8.32-04	5.49-04	3.82-04	2.76-04	2.05-04	1.57-04	1.21-04	9.52-05	7.44-05	5.54-05
15	1.86-02	6.20-03	2.92-03	1.63-03	1.01-03	6.69-04	4.67-04	3.38-04	2.52-04	1.91-04	1.47-04	1.13-04	8.34-05	
14	2.20-02	7.40-03	3.53-03	1.99-03	1.24-03	8.29-04	5.80-04	4.20-04	3.12-04	2.35-04	1.78-04	1.29-04		
13	2.65-02	9.01-03	4.36-03	2.49-03	1.56-03	1.04-03	7.31-04	5.28-04	3.90-04	2.89-04	2.05-04			
12	3.26-02	1.12-02	5.51-03	3.17-03	2.00-03	1.34-03	9.37-04	6.73-04	4.87-04	3.39-04				
11	4.13-02	1.44-02	7.15-03	4.14-03	2.62-03	1.76-03	1.22-03	8.61-04	5.85-04					
10	5.41-02	1.91-02	9.54-03	5.56-03	3.52-03	2.35-03	1.61-03	1.06-03						
9	7.37-02	2.62-02	1.32-02	7.71-03	4.88-03	3.21-03	2.06-03							
8	1.05-01	3.75-02	1.90-02	1.11-02	6.96-03	4.31-03								
7	1.59-01	5.69-02	2.90-02	1.68-02	9.97-03									
6	2.58-01	9.29-02	4.73-02	2.63-02										
5	4.67-01	1.68-01	8.28-02											
4	1.00+00	3.49-01												
3	2.88+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.46-06	2.05-06	1.73-06	1.47-06	1.26-06	1.09-06	9.48-07	8.30-07	7.30-07	6.46-07	5.74-07	5.12-07	4.59-07	4.13-07
45	3.25-06	2.71-06	2.29-06	1.95-06	1.67-06	1.44-06	1.25-06	1.10-06	9.65-07	8.54-07	7.59-07	6.77-07	6.07-07	5.45-07
40	4.36-06	3.64-06	3.07-06	2.61-06	2.24-06	1.93-06	1.68-06	1.47-06	1.29-06	1.14-06	1.01-06	9.05-07	8.10-07	7.27-07
35	5.94-06	4.95-06	4.17-06	3.55-06	3.04-06	2.63-06	2.28-06	2.00-06	1.75-06	1.55-06	1.37-06	1.22-06	1.09-06	9.75-07
30	8.46-06	7.06-06	5.94-06	5.05-06	4.33-06	3.73-06	3.23-06	2.82-06	2.47-06	2.17-06	1.90-06	1.67-06	1.44-06	1.18-06
29	9.19-06	7.66-06	6.45-06	5.48-06	4.69-06	4.04-06	3.51-06	3.05-06	2.67-06	2.33-06	2.03-06	1.75-06	1.43-06	
28	1.00-05	8.37-06	7.05-06	5.98-06	5.12-06	4.41-06	3.82-06	3.31-06	2.88-06	2.50-06	2.15-06	1.74-06		
27	1.10-05	9.19-06	7.74-06	6.57-06	5.61-06	4.83-06	4.17-06	3.61-06	3.12-06	2.66-06	2.15-06			
26	1.22-05	1.02-05	8.55-06	7.25-06	6.19-06	5.31-06	4.57-06	3.93-06	3.34-06	2.68-06				
25	1.36-05	1.13-05	9.51-06	8.05-06	6.86-06	5.87-06	5.02-06	4.24-06	3.39-06					
24	1.52-05	1.27-05	1.06-05	9.00-06	7.64-06	6.49-06	5.46-06	4.34-06						
23	1.72-05	1.43-05	1.20-05	1.01-05	8.52-06	7.12-06	5.63-06							
22	1.95-05	1.62-05	1.36-05	1.14-05	9.42-06	7.42-06								
21	2.24-05	1.85-05	1.54-05	1.27-05	9.91-06									
20	2.58-05	2.12-05	1.74-05	1.35-05										
19	2.99-05	2.42-05	1.86-05											
18	3.44-05	2.63-05												
17	3.78-05													

H TE = 7.50+03 NE = 1.00+05 CASE B NC = 60

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	7.97-38	-3.30-37	-1.37-36	-3.60-36	-7.75-36	-1.48-35	-2.62-35	-4.39-35	-7.05-35	-1.10-34	-1.67-34	-2.51-34	-3.70-34
45	0.00+00	1.22-37	-4.01-37	-1.73-36	-4.56-36	-9.85-36	-1.89-35	-3.34-35	-5.60-35	-9.03-35	-1.42-34	-2.17-34	-3.29-34	-4.91-34
40	0.00+00	2.04-37	-4.49-37	-2.09-36	-5.59-36	-1.21-35	-2.31-35	-4.07-35	-6.83-35	-1.10-34	-1.74-34	-2.69-34	-4.12-34	-6.26-34
35	0.00+00	3.69-37	-4.00-37	-2.30-36	-6.27-36	-1.35-35	-2.55-35	-4.43-35	-7.32-35	-1.17-34	-1.84-34	-2.86-34	-4.45-34	-6.94-34
30	0.00+00	7.06-37	-1.41-37	-2.14-36	-6.16-36	-1.30-35	-2.34-35	-3.83-35	-5.87-35	-8.67-35	-1.26-34	-1.87-34	-2.86-34	-4.60-34
29	0.00+00	8.07-37	-5.42-38	-2.07-36	-6.05-36	-1.27-35	-2.25-35	-3.57-35	-5.26-35	-7.40-35	-1.02-34	-1.43-34	-2.11-34	-3.38-34
28	0.00+00	9.24-37	4.79-38	-1.97-36	-5.92-36	-1.23-35	-2.13-35	-3.26-35	-4.53-35	-5.85-35	-7.16-35	-8.66-35	-1.12-34	-1.73-34
27	0.00+00	1.06-36	1.70-37	-1.86-36	-5.74-36	-1.18-35	-1.99-35	-2.89-35	-3.65-35	-3.95-35	-3.35-35	-1.48-35	1.71-35	5.06-35
26	0.00+00	1.22-36	3.18-37	-1.70-36	-5.51-36	-1.12-35	-1.82-35	-2.43-35	-2.56-35	-1.58-35	1.49-35	7.89-35	1.91-34	3.62-34
25	0.00+00	1.41-36	5.04-37	-1.49-36	-5.18-36	-1.04-35	-1.59-35	-1.85-35	-1.18-35	1.47-35	7.82-35	2.04-34	4.30-34	8.08-34
24	0.00+00	1.64-36	7.40-37	-1.20-36	-4.69-36	-9.27-36	-1.29-35	-1.08-35	6.39-36	5.50-35	1.63-34	3.77-34	7.71-34	1.47-33
23	0.00+00	1.92-36	1.05-36	-7.79-37	-3.94-36	-7.57-36	-8.64-36	-3.45-37	3.08-35	1.09-34	2.80-34	6.20-34	1.27-33	2.49-33
22	0.00+00	2.26-36	1.45-36	-1.71-37	-2.82-36	-5.07-36	-2.68-36	1.39-35	6.40-35	1.84-34	4.44-34	9.74-34	2.03-33	4.14-33
21	0.00+00	2.69-36	1.99-36	6.98-37	-1.15-36	-1.46-36	5.71-36	3.36-35	1.10-34	2.88-34	6.78-34	1.50-33	3.23-33	6.94-33
20	0.00+00	3.22-36	2.71-36	1.93-36	1.25-36	3.71-36	1.74-35	6.07-35	1.72-34	4.34-34	1.02-33	2.31-33	5.20-33	1.20-32
19	0.00+00	3.89-36	3.66-36	3.64-36	4.67-36	1.10-35	3.36-35	9.80-35	2.60-34	6.42-34	1.53-33	3.59-33	8.66-33	2.23-32
18	0.00+00	4.74-36	4.92-36	6.01-36	9.45-36	2.11-35	5.59-35	1.49-34	3.82-34	9.44-34	2.31-33	5.77-33	1.54-32	4.68-32
17	0.00+00	5.82-36	6.59-36	9.23-36	1.60-35	3.50-35	8.65-35	2.20-34	5.54-34	1.39-33	3.58-33	9.79-33	3.05-32	1.26-31
16	0.00+00	7.21-36	8.78-36	1.36-35	2.51-35	5.41-35	1.29-34	3.18-34	8.05-34	2.10-33	5.83-33	1.84-32	7.62-32	6.46-31
15	0.00+00	9.01-36	1.17-35	1.95-35	3.75-35	8.07-35	1.88-34	4.60-34	1.19-33	3.29-33	1.03-32	4.23-32	3.45-31	
14	0.00+00	1.14-35	1.55-35	2.75-35	5.49-35	1.19-34	2.74-34	6.76-34	1.81-33	5.54-33	2.17-32	1.61-31		
13	0.00+00	1.45-35	2.08-35	3.89-35	8.02-35	1.76-34	4.10-34	1.03-33	2.95-33	1.05-32	6.36-32			
12	0.00+00	1.90-35	2.83-35	5.55-35	1.19-34	2.70-34	6.47-34	1.70-33	5.26-33	1.90-32				
11	0.00+00	2.54-35	3.95-35	8.21-35	1.87-34	4.48-34	1.14-33	3.15-33	3.83-33					
10	0.00+00	3.52-35	5.75-35	1.29-34	3.21-34	8.57-34	2.44-33	2.36-33						
9	0.00+00	5.13-35	8.97-35	2.24-34	6.49-34	2.12-33	5.71-33							
8	0.00+00	8.01-35	1.54-34	4.59-34	1.76-33	8.82-33								
7	0.00+00	1.37-34	3.11-34	1.28-33	9.42-33									
6	0.00+00	2.75-34	8.44-34	7.48-33										
5	0.00+00	7.22-34	4.73-33											
4	0.00+00	3.67-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.39-34	-7.77-34	-1.11-33	-1.56-33	-2.18-33	-3.02-33	-4.13-33	-5.61-33	-7.55-33	-1.01-32	-1.34-32	-1.77-32	-2.33-32	-3.04-32
45	-7.26-34	-1.06-33	-1.55-33	-2.22-33	-3.17-33	-4.49-33	-6.31-33	-8.81-33	-1.22-32	-1.69-32	-2.33-32	-3.19-32	-4.37-32	-5.97-32
40	-9.47-34	-1.42-33	-2.13-33	-3.16-33	-4.67-33	-6.86-33	-1.00-32	-1.47-32	-2.14-32	-3.12-32	-4.56-32	-6.69-32	-9.88-32	-1.47-31
35	-1.09-33	-1.71-33	-2.69-33	-4.23-33	-6.65-33	-1.05-32	-1.65-32	-2.62-32	-4.19-32	-6.79-32	-1.12-31	-1.90-31	-3.33-31	-6.12-31
30	-7.75-34	-1.35-33	-2.43-33	-4.40-33	-8.06-33	-1.49-32	-2.81-32	-5.45-32	-1.11-31	-2.40-31	-5.79-31	-1.66-30	-6.58-30	-5.73-29
29	-5.88-34	-1.09-33	-2.08-33	-4.04-33	-7.91-33	-1.56-32	-3.16-32	-6.65-32	-1.49-31	-3.69-31	-1.09-30	-4.42-30	-3.95-29	
28	-3.26-34	-6.91-34	-1.52-33	-3.35-33	-7.31-33	-1.60-32	-3.57-32	-8.40-32	-2.17-31	-6.62-31	-2.78-30	-2.56-29		
27	4.64-35	-9.80-35	-6.24-34	-2.09-33	-5.83-33	-1.52-32	-3.99-32	-1.12-31	-3.61-31	-1.59-30	-1.53-29			
26	5.87-34	8.15-34	8.72-34	2.61-34	-2.43-33	-1.15-32	-4.20-32	-1.59-31	-7.77-31	-8.07-30				
25	1.40-33	2.28-33	3.47-33	4.86-33	5.55-33	1.44-33	-2.90-32	-2.42-31	-3.21-30					
24	2.68-33	4.74-33	8.29-33	1.46-32	2.61-32	4.87-32	8.94-32	-1.17-31						
23	4.78-33	9.16-33	1.80-32	3.76-32	8.91-32	2.75-31	1.70-30							
22	8.45-33	1.77-32	3.99-32	1.03-31	3.56-31	2.59-30								
21	1.53-32	3.64-32	9.96-32	3.64-31	2.84-30									
20	2.98-32	8.51-32	3.25-31	2.64-30										
19	6.60-32	2.61-31	2.18-30											
18	1.90-31	1.61-30												
17	1.08-30													

H TE = 7.50+03 NE = 1.00+06 CASE B NC = 38

TOTAL RC = 3.339-13 4-2 RC = 3.955-14 4-2 EM = 1.616-25 2S RC = 1.057-13 2P RC = 2.281-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.18-03	3.62-04	1.56-04	8.06-05	4.70-05	2.98-05	2.00-05	1.41-05	1.03-05	7.78-06	6.00-06	4.73-06	3.79-06	3.08-06
45	1.61-03	4.93-04	2.12-04	1.10-04	6.41-05	4.06-05	2.73-05	1.92-05	1.41-05	1.06-05	8.17-06	6.43-06	5.16-06	4.20-06
40	2.26-03	6.92-04	2.97-04	1.54-04	8.99-05	5.69-05	3.83-05	2.70-05	1.97-05	1.48-05	1.15-05	9.02-06	7.23-06	5.88-06
35	3.25-03	9.97-04	4.28-04	2.22-04	1.29-04	8.20-05	5.51-05	3.89-05	2.84-05	2.14-05	1.65-05	1.30-05	1.04-05	8.46-06
30	4.79-03	1.47-03	6.32-04	3.28-04	1.91-04	1.21-04	8.14-05	5.74-05	4.19-05	3.15-05	2.43-05	1.91-05	1.53-05	1.25-05
29	5.19-03	1.59-03	6.85-04	3.55-04	2.07-04	1.31-04	8.82-05	6.21-05	4.54-05	3.42-05	2.63-05	2.07-05	1.66-05	1.35-05
28	5.62-03	1.73-03	7.42-04	3.84-04	2.24-04	1.42-04	9.56-05	6.73-05	4.92-05	3.70-05	2.85-05	2.25-05	1.80-05	1.46-05
27	6.09-03	1.87-03	8.04-04	4.17-04	2.43-04	1.54-04	1.04-04	7.30-05	5.34-05	4.02-05	3.10-05	2.44-05	1.95-05	1.59-05
26	6.61-03	2.03-03	8.73-04	4.53-04	2.64-04	1.67-04	1.13-04	7.93-05	5.80-05	4.36-05	3.36-05	2.65-05	2.12-05	1.72-05
25	7.19-03	2.21-03	9.50-04	4.93-04	2.87-04	1.82-04	1.23-04	8.64-05	6.31-05	4.75-05	3.66-05	2.88-05	2.31-05	1.87-05
24	7.85-03	2.41-03	1.04-03	5.38-04	3.14-04	1.99-04	1.34-04	9.44-05	6.89-05	5.19-05	4.00-05	3.15-05	2.52-05	2.04-05
23	8.60-03	2.64-03	1.14-03	5.90-04	3.45-04	2.18-04	1.47-04	1.04-04	7.57-05	5.70-05	4.39-05	3.45-05	2.76-05	2.24-05
22	9.47-03	2.91-03	1.26-03	6.51-04	3.81-04	2.41-04	1.63-04	1.15-04	8.37-05	6.30-05	4.86-05	3.82-05	3.05-05	2.47-05
21	1.05-02	3.24-03	1.40-03	7.25-04	4.24-04	2.69-04	1.81-04	1.28-04	9.34-05	7.03-05	5.41-05	4.26-05	3.40-05	2.75-05
20	1.18-02	3.63-03	1.57-03	8.14-04	4.76-04	3.02-04	2.04-04	1.44-04	1.05-04	7.91-05	6.10-05	4.79-05	3.82-05	3.09-05
19	1.33-02	4.10-03	1.77-03	9.23-04	5.41-04	3.44-04	2.32-04	1.64-04	1.20-04	9.01-05	6.94-05	5.45-05	4.34-05	3.50-05
18	1.51-02	4.67-03	2.02-03	1.06-03	6.20-04	3.95-04	2.67-04	1.88-04	1.38-04	1.04-04	7.99-05	6.26-05	4.98-05	3.98-05
17	1.73-02	5.36-03	2.33-03	1.22-03	7.19-04	4.59-04	3.10-04	2.20-04	1.61-04	1.21-04	9.31-05	7.28-05	5.75-05	4.53-05
16	1.99-02	6.21-03	2.72-03	1.43-03	8.44-04	5.40-04	3.66-04	2.59-04	1.90-04	1.43-04	1.10-04	8.54-05	6.64-05	4.94-05
15	2.31-02	7.26-03	3.20-03	1.69-03	1.00-03	6.45-04	4.39-04	3.12-04	2.28-04	1.72-04	1.31-04	1.00-04	7.37-05	
14	2.70-02	8.57-03	3.81-03	2.03-03	1.22-03	7.85-04	5.36-04	3.81-04	2.79-04	2.09-04	1.57-04	1.14-04		
13	3.20-02	1.02-02	4.62-03	2.49-03	1.50-03	9.74-04	6.67-04	4.75-04	3.47-04	2.56-04	1.82-04			
12	3.84-02	1.25-02	5.71-03	3.12-03	1.90-03	1.24-03	8.50-04	6.04-04	4.35-04	3.03-04				
11	4.72-02	1.55-02	7.25-03	4.01-03	2.46-03	1.62-03	1.11-03	7.76-04	5.28-04					
10	5.99-02	2.00-02	9.50-03	5.34-03	3.30-03	2.17-03	1.47-03	9.67-04						
9	7.90-02	2.68-02	1.30-02	7.37-03	4.57-03	2.96-03	1.89-03							
8	1.09-01	3.78-02	1.86-02	1.06-02	6.51-03	3.98-03								
7	1.62-01	5.67-02	2.82-02	1.60-02	9.27-03									
6	2.60-01	9.19-02	4.56-02	2.46-02										
5	4.69-01	1.65-01	7.87-02											
4	1.00+00	3.37-01												
3	2.85+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.54-06	2.12-06	1.79-06	1.52-06	1.30-06	1.13-06	9.81-07	8.58-07	7.55-07	6.68-07	5.94-07	5.30-07	4.75-07	4.27-07
45	3.46-06	2.89-06	2.43-06	2.07-06	1.77-06	1.53-06	1.33-06	1.17-06	1.03-06	9.07-07	8.06-07	7.19-07	6.44-07	5.79-07
40	4.85-06	4.04-06	3.41-06	2.90-06	2.48-06	2.14-06	1.86-06	1.63-06	1.43-06	1.27-06	1.12-06	1.00-06	8.97-07	8.06-07
35	6.97-06	5.82-06	4.90-06	4.16-06	3.57-06	3.08-06	2.67-06	2.34-06	2.05-06	1.81-06	1.60-06	1.43-06	1.27-06	1.14-06
30	1.03-05	8.56-06	7.20-06	6.11-06	5.23-06	4.51-06	3.91-06	3.40-06	2.98-06	2.61-06	2.29-06	2.00-06	1.73-06	1.41-06
29	1.11-05	9.26-06	7.79-06	6.61-06	5.65-06	4.87-06	4.21-06	3.66-06	3.20-06	2.79-06	2.44-06	2.10-06	1.70-06	
28	1.20-05	1.00-05	8.43-06	7.17-06	6.11-06	5.26-06	4.54-06	3.94-06	3.43-06	2.97-06	2.55-06	2.06-06		
27	1.31-05	1.09-05	9.13-06	7.74-06	6.61-06	5.67-06	4.89-06	4.23-06	3.65-06	3.11-06	2.51-06			
26	1.42-05	1.18-05	9.90-06	8.38-06	7.15-06	6.12-06	5.26-06	4.52-06	3.83-06	3.08-06				
25	1.54-05	1.28-05	1.07-05	9.09-06	7.73-06	6.60-06	5.63-06	4.75-06	3.80-06					
24	1.68-05	1.40-05	1.17-05	9.87-06	8.37-06	7.09-06	5.95-06	4.73-06						
23	1.84-05	1.53-05	1.28-05	1.07-05	9.04-06	7.53-06	5.95-06							
22	2.03-05	1.68-05	1.40-05	1.17-05	9.67-06	7.59-06								
21	2.25-05	1.86-05	1.54-05	1.26-05	9.84-06									
20	2.52-05	2.07-05	1.68-05	1.30-05										
19	2.83-05	2.28-05	1.75-05											
18	3.18-05	2.41-05												
17	3.40-05													

H TE = 7.50+03 NE = 1.00+06 CASE B NC = 38

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	7.10-38	-3.85-37	-1.57-36	-4.16-36	-9.10-36	-1.78-35	-3.23-35	-5.54-35	-9.10-35	-1.45-34	-2.23-34	-3.36-34	-4.93-34
45	0.00+00	1.00-37	-5.21-37	-2.14-36	-5.69-36	-1.25-35	-2.46-35	-4.49-35	-7.75-35	-1.28-34	-2.06-34	-3.22-34	-4.89-34	-7.28-34
40	0.00+00	1.50-37	-7.16-37	-2.98-36	-7.98-36	-1.77-35	-3.50-35	-6.43-35	-1.12-34	-1.88-34	-3.06-34	-4.84-34	-7.50-34	-1.14-33
35	0.00+00	2.53-37	-9.61-37	-4.15-36	-1.12-35	-2.51-35	-5.02-35	-9.33-35	-1.65-34	-2.81-34	-4.67-34	-7.57-34	-1.20-33	-1.88-33
30	0.00+00	4.90-37	-1.18-36	-5.57-36	-1.54-35	-3.48-35	-7.04-35	-1.33-34	-2.40-34	-4.20-34	-7.20-34	-1.21-33	-2.02-33	-3.32-33
29	0.00+00	5.71-37	-1.19-36	-5.83-36	-1.62-35	-3.67-35	-7.45-35	-1.41-34	-2.56-34	-4.51-34	-7.80-34	-1.33-33	-2.24-33	-3.74-33
28	0.00+00	6.70-37	-1.18-36	-6.04-36	-1.69-35	-3.85-35	-7.83-35	-1.49-34	-2.71-34	-4.82-34	-8.41-34	-1.45-33	-2.48-33	-4.21-33
27	0.00+00	7.90-37	-1.14-36	-6.20-36	-1.76-35	-4.00-35	-8.16-35	-1.56-34	-2.85-34	-5.11-34	-9.01-34	-1.58-33	-2.74-33	-4.74-33
26	0.00+00	9.38-37	-1.06-36	-6.30-36	-1.80-35	-4.12-35	-8.42-35	-1.61-34	-2.97-34	-5.36-34	-9.57-34	-1.70-33	-3.01-33	-5.34-33
25	0.00+00	1.12-36	-9.37-37	-6.30-36	-1.83-35	-4.20-35	-8.59-35	-1.65-34	-3.05-34	-5.56-34	-1.01-33	-1.82-33	-3.31-33	-6.03-33
24	0.00+00	1.34-36	-7.65-37	-6.22-36	-1.84-35	-4.24-35	-8.66-35	-1.66-34	-3.09-34	-5.69-34	-1.05-33	-1.94-33	-3.61-33	-6.82-33
23	0.00+00	1.60-36	-5.35-37	-6.05-36	-1.83-35	-4.22-35	-8.62-35	-1.65-34	-3.09-34	-5.74-34	-1.07-33	-2.04-33	-3.94-33	-7.75-33
22	0.00+00	1.92-36	-2.42-37	-5.78-36	-1.80-35	-4.17-35	-8.47-35	-1.62-34	-3.03-34	-5.68-34	-1.09-33	-2.13-33	-4.29-33	-8.91-33
21	0.00+00	2.31-36	1.27-37	-5.42-36	-1.76-35	-4.07-35	-8.22-35	-1.56-34	-2.90-34	-5.49-34	-1.07-33	-2.19-33	-4.67-33	-1.04-32
20	0.00+00	2.80-36	5.92-37	-4.94-36	-1.69-35	-3.93-35	-7.83-35	-1.46-34	-2.68-34	-5.09-34	-1.02-33	-2.20-33	-5.06-33	-1.25-32
19	0.00+00	3.40-36	1.19-36	-4.27-36	-1.60-35	-3.71-35	-7.23-35	-1.30-34	-2.31-34	-4.31-34	-8.91-34	-2.06-33	-5.33-33	-1.54-32
18	0.00+00	4.16-36	2.00-36	-3.28-36	-1.44-35	-3.35-35	-6.22-35	-1.03-34	-1.63-34	-2.76-34	-5.71-34	-1.51-33	-4.87-33	-1.88-32
17	0.00+00	5.15-36	3.13-36	-1.74-36	-1.17-35	-2.70-35	-4.46-35	-5.46-35	-3.56-35	4.55-35	2.12-34	3.24-34	-9.26-34	-1.54-32
16	0.00+00	6.46-36	4.74-36	7.41-37	-6.90-36	-1.55-35	-1.32-35	3.37-35	2.13-34	7.47-34	2.25-33	6.76-33	2.38-32	1.49-31
15	0.00+00	8.22-36	7.09-36	4.76-36	1.38-36	4.89-36	4.33-35	2.00-34	7.22-34	2.41-33	8.35-33	3.59-32	3.08-31	
14	0.00+00	1.06-35	1.06-35	1.13-35	1.56-35	2.09-35	1.46-34	5.24-34	1.85-33	6.94-33	3.26-32	3.08-31		
13	0.00+00	1.40-35	1.59-35	2.18-35	3.99-35	1.05-34	3.40-34	1.20-33	4.70-33	2.33-32	2.31-31			
12	0.00+00	1.89-35	2.38-35	3.90-35	8.16-35	2.21-34	7.25-34	2.80-33	1.41-32	1.41-31				
11	0.00+00	2.59-35	3.61-35	6.73-35	1.56-34	4.47-34	1.59-33	7.64-33	7.26-32					
10	0.00+00	3.64-35	5.56-35	1.16-34	2.98-34	9.47-34	4.07-33	3.32-32						
9	0.00+00	5.33-35	8.89-35	2.11-34	6.20-34	2.39-33	1.57-32							
8	0.00+00	8.26-35	1.53-34	4.29-34	1.61-33	9.73-33								
7	0.00+00	1.41-34	3.05-34	1.15-33	7.89-33									
6	0.00+00	2.78-34	8.06-34	6.30-33										
5	0.00+00	7.27-34	4.35-33											
4	0.00+00	3.66-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-7.09-34	-9.99-34	-1.38-33	-1.88-33	-2.50-33	-3.28-33	-4.23-33	-5.35-33	-6.65-33	-8.15-33	-9.87-33	-1.18-32	-1.41-32	-1.67-32
45	-1.06-33	-1.52-33	-2.14-33	-2.96-33	-4.03-33	-5.40-33	-7.12-33	-9.24-33	-1.18-32	-1.50-32	-1.87-32	-2.33-32	-2.89-32	-3.58-32
40	-1.69-33	-2.48-33	-3.58-33	-5.09-33	-7.15-33	-9.92-33	-1.36-32	-1.84-32	-2.46-32	-3.27-32	-4.34-32	-5.75-32	-7.67-32	-1.03-31
35	-2.90-33	-4.40-33	-6.62-33	-9.86-33	-1.46-32	-2.14-32	-3.13-32	-4.56-32	-6.64-32	-9.73-32	-1.44-31	-2.19-31	-3.43-31	-5.65-31
30	-5.41-33	-8.79-33	-1.43-32	-2.32-32	-3.79-32	-6.26-32	-1.05-31	-1.81-31	-3.25-31	-6.20-31	-1.31-30	-3.27-30	-1.13-29	-8.59-29
29	-6.20-33	-1.03-32	-1.70-32	-2.85-32	-4.81-32	-8.27-32	-1.46-31	-2.68-31	-5.22-31	-1.12-30	-2.86-30	-1.00-29	-7.74-29	
28	-7.12-33	-1.21-32	-2.06-32	-3.55-32	-6.25-32	-1.13-31	-2.12-31	-4.24-31	-9.35-31	-2.43-30	-8.69-30	-6.80-29		
27	-8.21-33	-1.43-32	-2.52-32	-4.53-32	-8.38-32	-1.61-31	-3.31-31	-7.48-31	-1.99-30	-7.27-30	-5.80-29			
26	-9.52-33	-1.71-32	-3.15-32	-5.94-32	-1.17-31	-2.46-31	-5.71-31	-1.56-30	-5.84-30	-4.77-29				
25	-1.11-32	-2.08-32	-4.02-32	-8.11-32	-1.75-31	-4.15-31	-1.17-30	-4.48-30	-3.76-29					
24	-1.31-32	-2.58-32	-5.33-32	-1.17-31	-2.86-31	-8.25-31	-3.26-30	-2.81-29						
23	-1.57-32	-3.31-32	-7.46-32	-1.86-31	-5.50-31	-2.24-30	-1.98-29							
22	-1.93-32	-4.46-32	-1.14-31	-3.45-31	-1.44-30	-1.32-29								
21	-2.48-32	-6.52-32	-2.03-31	-8.69-31	-8.16-30									
20	-3.41-32	-1.10-31	-4.86-31	-4.70-30										
19	-5.24-32	-2.43-31	-2.45-30											
18	-9.70-32	-1.07-30												
17	-2.66-31													

H TE = 7.50+03 NE = 1.00+07 CASE B NC = 24

TOTAL RC = 3.403-13 4-2 RC = 4.033-14 4-2 EM = 1.648-25 2S RC = 1.087-13 2P RC = 2.316-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.17-03	3.58-04	1.54-04	7.98-05	4.66-05	2.95-05	1.98-05	1.40-05	1.02-05	7.70-06	5.94-06	4.68-06	3.75-06	3.05-06
45	1.60-03	4.92-04	2.11-04	1.09-04	6.39-05	4.04-05	2.72-05	1.92-05	1.40-05	1.06-05	8.15-06	6.42-06	5.14-06	4.18-06
40	2.28-03	7.00-04	3.01-04	1.56-04	9.05-05	5.75-05	3.87-05	2.73-05	1.99-05	1.50-05	1.16-05	9.11-06	7.30-06	5.94-06
35	3.39-03	1.04-03	4.47-04	2.31-04	1.35-04	8.54-05	5.75-05	4.05-05	2.96-05	2.23-05	1.72-05	1.35-05	1.08-05	8.81-06
30	5.31-03	1.63-03	6.99-04	3.62-04	2.11-04	1.34-04	8.99-05	6.33-05	4.62-05	3.48-05	2.68-05	2.11-05	1.69-05	1.37-05
29	5.84-03	1.79-03	7.70-04	3.99-04	2.32-04	1.47-04	9.89-05	6.97-05	5.09-05	3.83-05	2.95-05	2.32-05	1.86-05	1.51-05
28	6.45-03	1.98-03	8.49-04	4.40-04	2.56-04	1.62-04	1.09-04	7.68-05	5.61-05	4.22-05	3.25-05	2.56-05	2.05-05	1.66-05
27	7.13-03	2.19-03	9.39-04	4.86-04	2.83-04	1.79-04	1.21-04	8.49-05	6.20-05	4.66-05	3.59-05	2.83-05	2.26-05	1.84-05
26	7.90-03	2.42-03	1.04-03	5.39-04	3.14-04	1.99-04	1.34-04	9.40-05	6.86-05	5.16-05	3.98-05	3.13-05	2.50-05	2.03-05
25	8.77-03	2.69-03	1.15-03	5.97-04	3.48-04	2.20-04	1.48-04	1.04-04	7.61-05	5.72-05	4.41-05	3.46-05	2.77-05	2.25-05
24	9.69-03	2.97-03	1.28-03	6.61-04	3.85-04	2.44-04	1.64-04	1.15-04	8.42-05	6.33-05	4.87-05	3.83-05	3.06-05	2.48-05
23	1.08-02	3.30-03	1.42-03	7.34-04	4.28-04	2.71-04	1.82-04	1.28-04	9.35-05	7.03-05	5.41-05	4.25-05	3.40-05	2.75-05
22	1.20-02	3.67-03	1.58-03	8.16-04	4.76-04	3.01-04	2.02-04	1.42-04	1.04-04	7.80-05	6.01-05	4.72-05	3.77-05	3.05-05
21	1.33-02	4.08-03	1.75-03	9.07-04	5.29-04	3.35-04	2.25-04	1.58-04	1.15-04	8.67-05	6.67-05	5.23-05	4.17-05	3.37-05
20	1.48-02	4.54-03	1.95-03	1.01-03	5.88-04	3.72-04	2.50-04	1.76-04	1.28-04	9.63-05	7.40-05	5.80-05	4.62-05	3.73-05
19	1.65-02	5.05-03	2.17-03	1.12-03	6.55-04	4.14-04	2.78-04	1.96-04	1.43-04	1.07-04	8.22-05	6.44-05	5.12-05	4.11-05
18	1.84-02	5.64-03	2.43-03	1.26-03	7.32-04	4.63-04	3.11-04	2.19-04	1.59-04	1.19-04	9.17-05	7.16-05	5.67-05	4.53-05
17	2.07-02	6.35-03	2.73-03	1.41-03	8.24-04	5.21-04	3.50-04	2.46-04	1.79-04	1.34-04	1.03-04	8.00-05	6.29-05	4.94-05
16	2.35-02	7.22-03	3.11-03	1.61-03	9.39-04	5.94-04	3.99-04	2.80-04	2.04-04	1.52-04	1.16-04	8.98-05	6.95-05	5.14-05
15	2.71-02	8.33-03	3.59-03	1.86-03	1.09-03	6.87-04	4.61-04	3.24-04	2.35-04	1.75-04	1.33-04	1.01-04	7.36-05	
14	3.18-02	9.78-03	4.22-03	2.19-03	1.28-03	8.10-04	5.44-04	3.81-04	2.76-04	2.04-04	1.53-04	1.09-04		
13	3.78-02	1.17-02	5.05-03	2.63-03	1.54-03	9.75-04	6.54-04	4.58-04	3.30-04	2.41-04	1.69-04			
12	4.58-02	1.42-02	6.17-03	3.22-03	1.89-03	1.20-03	8.05-04	5.61-04	3.98-04	2.74-04				
11	5.63-02	1.76-02	7.70-03	4.05-03	2.38-03	1.52-03	1.01-03	6.98-04	4.69-04					
10	7.06-02	2.23-02	9.86-03	5.23-03	3.10-03	1.97-03	1.31-03	8.53-04						
9	9.10-02	2.91-02	1.31-02	7.03-03	4.19-03	2.65-03	1.67-03							
8	1.22-01	3.96-02	1.82-02	9.91-03	5.90-03	3.55-03								
7	1.75-01	5.75-02	2.70-02	1.47-02	8.36-03									
6	2.71-01	9.08-02	4.31-02	2.25-02										
5	4.76-01	1.60-01	7.32-02											
4	1.00+00	3.20-01												
3	2.81+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.52-06	2.10-06	1.77-06	1.51-06	1.29-06	1.12-06	9.71-07	8.50-07	7.48-07	6.62-07	5.88-07	5.25-07	4.70-07	4.23-07
45	3.45-06	2.88-06	2.43-06	2.06-06	1.77-06	1.53-06	1.33-06	1.16-06	1.02-06	9.05-07	8.04-07	7.17-07	6.43-07	5.78-07
40	4.90-06	4.09-06	3.44-06	2.93-06	2.51-06	2.17-06	1.88-06	1.65-06	1.45-06	1.28-06	1.14-06	1.01-06	9.07-07	8.14-07
35	7.26-06	6.05-06	5.10-06	4.33-06	3.71-06	3.20-06	2.78-06	2.43-06	2.13-06	1.88-06	1.67-06	1.48-06	1.32-06	1.18-06
30	1.13-05	9.42-06	7.92-06	6.72-06	5.75-06	4.95-06	4.29-06	3.74-06	3.27-06	2.87-06	2.51-06	2.20-06	1.90-06	1.65-06
29	1.24-05	1.04-05	8.71-06	7.39-06	6.31-06	5.43-06	4.70-06	4.09-06	3.57-06	3.11-06	2.71-06	2.33-06	1.89-06	
28	1.37-05	1.14-05	9.58-06	8.12-06	6.94-06	5.96-06	5.15-06	4.47-06	3.88-06	3.37-06	2.88-06	2.33-06		
27	1.51-05	1.26-05	1.06-05	8.95-06	7.63-06	6.55-06	5.65-06	4.88-06	4.21-06	3.58-06	2.89-06			
26	1.67-05	1.39-05	1.17-05	9.86-06	8.40-06	7.19-06	6.18-06	5.30-06	4.49-06	3.60-06				
25	1.85-05	1.53-05	1.29-05	1.09-05	9.24-06	7.88-06	6.72-06	5.66-06	4.51-06					
24	2.04-05	1.69-05	1.42-05	1.20-05	1.01-05	8.57-06	7.18-06	5.70-06						
23	2.26-05	1.87-05	1.56-05	1.31-05	1.10-05	9.19-06	7.25-06							
22	2.50-05	2.07-05	1.72-05	1.43-05	1.18-05	9.28-06								
21	2.76-05	2.27-05	1.88-05	1.54-05	1.20-05									
20	3.04-05	2.48-05	2.02-05	1.56-05										
19	3.33-05	2.68-05	2.05-05											
18	3.60-05	2.72-05												
17	3.70-05													

H TE = 7.50+03 NE = 1.00+07 CASE B NC = 24

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	7.33-38	-4.02-37	-1.66-36	-4.47-36	-9.90-36	-1.95-35	-3.55-35	-6.07-35	-9.87-35	-1.54-34	-2.30-34	-3.32-34	-4.63-34
45	0.00+00	1.01-37	-5.56-37	-2.31-36	-6.21-36	-1.38-35	-2.74-35	-5.02-35	-8.65-35	-1.42-34	-2.23-34	-3.38-34	-4.94-34	-6.97-34
40	0.00+00	1.44-37	-7.97-37	-3.32-36	-9.00-36	-2.02-35	-4.03-35	-7.45-35	-1.30-34	-2.15-34	-3.44-34	-5.29-34	-7.86-34	-1.13-33
35	0.00+00	2.19-37	-1.19-36	-5.01-36	-1.37-35	-3.10-35	-6.27-35	-1.17-34	-2.08-34	-3.52-34	-5.73-34	-9.02-34	-1.38-33	-2.04-33
30	0.00+00	3.67-37	-1.85-36	-7.93-36	-2.20-35	-5.06-35	-1.04-34	-2.00-34	-3.62-34	-6.32-34	-1.07-33	-1.74-33	-2.79-33	-4.34-33
29	0.00+00	4.14-37	-2.03-36	-8.74-36	-2.43-35	-5.62-35	-1.16-34	-2.24-34	-4.10-34	-7.21-34	-1.23-33	-2.03-33	-3.28-33	-5.19-33
28	0.00+00	4.71-37	-2.22-36	-9.65-36	-2.70-35	-6.26-35	-1.30-34	-2.53-34	-4.66-34	-8.26-34	-1.42-33	-2.38-33	-3.91-33	-6.28-33
27	0.00+00	5.41-37	-2.43-36	-1.07-35	-2.99-35	-6.98-35	-1.46-34	-2.86-34	-5.31-34	-9.52-34	-1.66-33	-2.82-33	-4.70-33	-7.71-33
26	0.00+00	6.28-37	-2.64-36	-1.18-35	-3.32-35	-7.80-35	-1.64-34	-3.24-34	-6.08-34	-1.10-33	-1.95-33	-3.37-33	-5.72-33	-9.60-33
25	0.00+00	7.37-37	-2.87-36	-1.30-35	-3.69-35	-8.71-35	-1.85-34	-3.68-34	-6.99-34	-1.29-33	-2.31-33	-4.06-33	-7.07-33	-1.22-32
24	0.00+00	8.89-37	-3.04-36	-1.41-35	-4.05-35	-9.63-35	-2.06-34	-4.15-34	-7.99-34	-1.49-33	-2.73-33	-4.91-33	-8.78-33	-1.56-32
23	0.00+00	1.07-36	-3.22-36	-1.54-35	-4.46-35	-1.07-34	-2.32-34	-4.71-34	-9.21-34	-1.75-33	-3.27-33	-6.06-33	-1.12-32	-2.07-32
22	0.00+00	1.31-36	-3.34-36	-1.66-35	-4.88-35	-1.18-34	-2.59-34	-5.34-34	-1.06-33	-2.07-33	-3.96-33	-7.58-33	-1.46-32	-2.84-32
21	0.00+00	1.63-36	-3.38-36	-1.78-35	-5.30-35	-1.30-34	-2.88-34	-6.04-34	-1.23-33	-2.44-33	-4.84-33	-9.63-33	-1.95-32	-4.05-32
20	0.00+00	2.05-36	-3.28-36	-1.87-35	-5.68-35	-1.41-34	-3.18-34	-6.78-34	-1.41-33	-2.90-33	-5.98-33	-1.25-32	-2.70-32	-6.12-32
19	0.00+00	2.61-36	-2.98-36	-1.93-35	-6.01-35	-1.52-34	-3.47-34	-7.57-34	-1.62-33	-3.46-33	-7.48-33	-1.67-32	-3.93-32	-1.01-31
18	0.00+00	3.34-36	-2.43-36	-1.94-35	-6.25-35	-1.61-34	-3.74-34	-8.38-34	-1.86-33	-4.16-33	-9.58-33	-2.33-32	-6.22-32	-1.94-31
17	0.00+00	4.31-36	-1.57-36	-1.90-35	-6.40-35	-1.68-34	-4.00-34	-9.24-34	-2.14-33	-5.09-33	-1.28-32	-3.52-32	-1.14-31	-5.02-31
16	0.00+00	5.57-36	-3.45-37	-1.81-35	-6.47-35	-1.74-34	-4.26-34	-1.02-33	-2.50-33	-6.46-33	-1.83-32	-6.10-32	-2.78-31	-2.76-30
15	0.00+00	7.25-36	1.35-36	-1.67-35	-6.49-35	-1.81-34	-4.55-34	-1.14-33	-3.02-33	-8.79-33	-3.01-32	-1.41-31	-1.45-30	
14	0.00+00	9.51-36	3.74-36	-1.44-35	-6.42-35	-1.86-34	-4.86-34	-1.30-33	-3.83-33	-1.34-32	-6.49-32	-6.85-31		
13	0.00+00	1.27-35	7.30-36	-1.04-35	-6.08-35	-1.86-34	-5.08-34	-1.47-33	-5.14-33	-2.54-32	-2.78-31			
12	0.00+00	1.72-35	1.30-35	-2.61-36	-4.93-35	-1.65-34	-4.60-34	-1.45-33	-6.81-33	-7.73-32				
11	0.00+00	2.42-35	2.26-35	1.36-35	-1.63-35	-7.11-35	-9.09-35	3.86-34	7.04-33					
10	0.00+00	3.51-35	3.98-35	4.86-35	7.52-35	2.79-34	2.03-33	2.83-32						
9	0.00+00	5.32-35	7.23-35	1.29-34	3.45-34	1.79-33	2.30-32							
8	0.00+00	8.52-35	1.38-34	3.34-34	1.34-33	1.38-32								
7	0.00+00	1.47-34	2.93-34	1.02-33	8.29-33									
6	0.00+00	2.90-34	7.83-34	5.65-33										
5	0.00+00	7.47-34	4.03-33											
4	0.00+00	3.68-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-6.20-34	-7.99-34	-9.92-34	-1.19-33	-1.39-33	-1.58-33	-1.76-33	-1.94-33	-2.12-33	-2.25-33	-2.42-33	-2.59-33	-2.77-33	-2.96-33
45	-9.48-34	-1.24-33	-1.57-33	-1.92-33	-2.28-33	-2.66-33	-3.05-33	-3.46-33	-3.89-33	-4.28-33	-4.79-33	-5.36-33	-6.01-33	-6.77-33
40	-1.57-33	-2.11-33	-2.73-33	-3.43-33	-4.22-33	-5.10-33	-6.08-33	-7.20-33	-8.52-33	-9.91-33	-1.18-32	-1.42-32	-1.72-32	-2.13-32
35	-2.93-33	-4.08-33	-5.51-33	-7.27-33	-9.41-33	-1.21-32	-1.54-32	-1.97-32	-2.54-32	-3.27-32	-4.39-32	-6.07-32	-8.77-32	-1.34-31
30	-6.61-33	-9.81-33	-1.43-32	-2.05-32	-2.94-32	-4.23-32	-6.20-32	-9.39-32	-1.50-31	-2.53-31	-4.84-31	-1.11-30	-3.58-30	-2.56-29
29	-8.03-33	-1.22-32	-1.81-32	-2.68-32	-3.95-32	-5.91-32	-9.11-32	-1.47-31	-2.55-31	-4.86-31	-1.13-30	-3.64-30	-2.62-29	
28	-9.91-33	-1.54-32	-2.35-32	-3.58-32	-5.50-32	-8.64-32	-1.42-31	-2.49-31	-4.87-31	-1.12-30	-3.66-30	-2.64-29		
27	-1.24-32	-1.98-32	-3.13-32	-4.96-32	-7.99-32	-1.34-31	-2.39-31	-4.74-31	-1.12-30	-3.63-30	-2.65-29			
26	-1.59-32	-2.62-32	-4.30-32	-7.16-32	-1.23-31	-2.24-31	-4.52-31	-1.08-30	-3.58-30	-2.61-29				
25	-2.08-32	-3.57-32	-6.16-32	-1.09-31	-2.04-31	-4.21-31	-1.02-30	-3.43-30	-2.50-29					
24	-2.79-32	-5.01-32	-9.21-32	-1.78-31	-3.76-31	-9.33-31	-3.18-30	-2.37-29						
23	-3.88-32	-7.45-32	-1.49-31	-3.26-31	-8.32-31	-2.90-30	-2.21-29							
22	-5.67-32	-1.19-31	-2.69-31	-7.11-31	-2.55-30	-1.99-29								
21	-8.84-32	-2.09-31	-5.75-31	-2.13-30	-1.71-29									
20	-1.51-31	-4.35-31	-1.68-30	-1.40-29										
19	-3.04-31	-1.23-30	-1.07-29											
18	-8.24-31	-7.50-30												
17	-4.79-30													

H TE = 7.50+03 NE = 1.00+08 CASE B NC = 20

TOTAL RC = 3.523-13 4-2 RC = 4.223-14 4-2 EM = 1.726-25 2S RC = 1.137-13 2P RC = 2.386-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.12-03	3.43-04	1.47-04	7.64-05	4.45-05	2.82-05	1.90-05	1.34-05	9.78-06	7.37-06	5.68-06	4.48-06	3.59-06	2.92-06
45	1.54-03	4.71-04	2.02-04	1.05-04	6.12-05	3.88-05	2.61-05	1.84-05	1.34-05	1.01-05	7.80-06	6.15-06	4.93-06	4.01-06
40	2.19-03	6.72-04	2.89-04	1.50-04	8.73-05	5.53-05	3.72-05	2.62-05	1.91-05	1.44-05	1.11-05	8.76-06	7.02-06	5.71-06
35	3.28-03	1.01-03	4.32-04	2.24-04	1.30-04	8.26-05	5.56-05	3.92-05	2.86-05	2.15-05	1.66-05	1.31-05	1.05-05	8.52-06
30	5.22-03	1.60-03	6.87-04	3.56-04	2.07-04	1.31-04	8.83-05	6.22-05	4.54-05	3.42-05	2.64-05	2.07-05	1.66-05	1.35-05
29	5.78-03	1.77-03	7.61-04	3.94-04	2.30-04	1.45-04	9.77-05	6.88-05	5.03-05	3.78-05	2.92-05	2.29-05	1.84-05	1.49-05
28	6.42-03	1.97-03	8.45-04	4.38-04	2.55-04	1.61-04	1.09-04	7.64-05	5.58-05	4.20-05	3.24-05	2.55-05	2.04-05	1.66-05
27	7.15-03	2.19-03	9.42-04	4.88-04	2.84-04	1.80-04	1.21-04	8.52-05	6.22-05	4.68-05	3.60-05	2.83-05	2.27-05	1.84-05
26	8.00-03	2.45-03	1.05-03	5.46-04	3.18-04	2.01-04	1.35-04	9.52-05	6.95-05	5.23-05	4.03-05	3.17-05	2.53-05	2.06-05
25	8.99-03	2.76-03	1.18-03	6.13-04	3.57-04	2.26-04	1.52-04	1.07-04	7.80-05	5.87-05	4.52-05	3.55-05	2.84-05	2.31-05
24	1.01-02	3.11-03	1.34-03	6.91-04	4.03-04	2.55-04	1.71-04	1.20-04	8.79-05	6.61-05	5.09-05	4.00-05	3.20-05	2.59-05
23	1.15-02	3.52-03	1.51-03	7.82-04	4.56-04	2.88-04	1.94-04	1.36-04	9.95-05	7.47-05	5.75-05	4.52-05	3.61-05	2.92-05
22	1.31-02	4.00-03	1.72-03	8.89-04	5.18-04	3.28-04	2.20-04	1.55-04	1.13-04	8.48-05	6.53-05	5.12-05	4.09-05	3.31-05
21	1.49-02	4.57-03	1.96-03	1.01-03	5.91-04	3.74-04	2.51-04	1.76-04	1.29-04	9.66-05	7.43-05	5.83-05	4.65-05	3.76-05
20	1.70-02	5.22-03	2.24-03	1.16-03	6.76-04	4.27-04	2.87-04	2.02-04	1.47-04	1.10-04	8.47-05	6.64-05	5.29-05	4.26-05
19	1.96-02	6.00-03	2.58-03	1.33-03	7.76-04	4.90-04	3.29-04	2.31-04	1.68-04	1.26-04	9.69-05	7.58-05	6.02-05	4.84-05
18	2.25-02	6.91-03	2.96-03	1.53-03	8.92-04	5.64-04	3.78-04	2.66-04	1.93-04	1.45-04	1.11-04	8.66-05	6.85-05	5.47-05
17	2.60-02	7.96-03	3.41-03	1.76-03	1.03-03	6.49-04	4.35-04	3.05-04	2.22-04	1.66-04	1.27-04	9.87-05	7.75-05	6.08-05
16	2.99-02	9.16-03	3.93-03	2.03-03	1.18-03	7.46-04	5.00-04	3.50-04	2.54-04	1.90-04	1.45-04	1.12-04	8.62-05	6.36-05
15	3.44-02	1.05-02	4.52-03	2.33-03	1.36-03	8.56-04	5.73-04	4.01-04	2.91-04	2.16-04	1.63-04	1.24-04	9.02-05	
14	3.95-02	1.21-02	5.19-03	2.68-03	1.56-03	9.82-04	6.57-04	4.59-04	3.31-04	2.45-04	1.82-04	1.30-04		
13	4.56-02	1.40-02	5.99-03	3.09-03	1.80-03	1.13-03	7.55-04	5.26-04	3.77-04	2.74-04	1.92-04			
12	5.34-02	1.64-02	7.02-03	3.63-03	2.10-03	1.32-03	8.80-04	6.09-04	4.29-04	2.94-04				
11	6.43-02	1.97-02	8.46-03	4.37-03	2.53-03	1.59-03	1.05-03	7.14-04	4.75-04					
10	8.00-02	2.46-02	1.05-02	5.45-03	3.15-03	1.97-03	1.28-03	8.22-04						
9	1.03-01	3.17-02	1.37-02	7.05-03	4.07-03	2.51-03	1.54-03							
8	1.38-01	4.26-02	1.84-02	9.54-03	5.46-03	3.19-03								
7	1.93-01	6.01-02	2.63-02	1.36-02	7.42-03									
6	2.92-01	9.12-02	4.02-02	2.00-02										
5	4.94-01	1.56-01	6.60-02											
4	1.00+00	2.97-01												
3	2.72+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.41-06	2.01-06	1.69-06	1.44-06	1.24-06	1.07-06	9.29-07	8.13-07	7.16-07	6.33-07	5.63-07	5.02-07	4.50-07	4.05-07
45	3.31-06	2.76-06	2.32-06	1.98-06	1.69-06	1.46-06	1.27-06	1.11-06	9.80-07	8.67-07	7.70-07	6.87-07	6.16-07	5.53-07
40	4.71-06	3.93-06	3.31-06	2.81-06	2.41-06	2.08-06	1.81-06	1.58-06	1.39-06	1.23-06	1.09-06	9.73-07	8.71-07	7.82-07
35	7.02-06	5.85-06	4.93-06	4.19-06	3.59-06	3.10-06	2.69-06	2.35-06	2.06-06	1.82-06	1.61-06	1.44-06	1.28-06	1.14-06
30	1.11-05	9.26-06	7.79-06	6.61-06	5.65-06	4.87-06	4.22-06	3.67-06	3.21-06	2.82-06	2.47-06	2.16-06	1.87-06	1.52-06
29	1.23-05	1.02-05	8.60-06	7.30-06	6.24-06	5.37-06	4.65-06	4.04-06	3.52-06	3.08-06	2.68-06	2.30-06	1.87-06	
28	1.36-05	1.13-05	9.53-06	8.08-06	6.90-06	5.93-06	5.13-06	4.45-06	3.86-06	3.35-06	2.87-06	2.32-06		
27	1.52-05	1.26-05	1.06-05	8.97-06	7.66-06	6.57-06	5.67-06	4.89-06	4.22-06	3.60-06	2.90-06			
26	1.69-05	1.41-05	1.18-05	9.99-06	8.51-06	7.29-06	6.26-06	5.37-06	4.55-06	3.65-06				
25	1.89-05	1.57-05	1.32-05	1.12-05	9.48-06	8.08-06	6.89-06	5.80-06	4.63-06					
24	2.13-05	1.77-05	1.48-05	1.25-05	1.06-05	8.93-06	7.48-06	5.93-06						
23	2.40-05	1.99-05	1.66-05	1.39-05	1.17-05	9.74-06	7.68-06							
22	2.71-05	2.24-05	1.86-05	1.55-05	1.28-05	1.00-05								
21	3.07-05	2.53-05	2.09-05	1.71-05	1.33-05									
20	3.47-05	2.84-05	2.30-05	1.77-05										
19	3.91-05	3.14-05	2.40-05											
18	4.34-05	3.28-05												
17	4.54-05													

H TE = 7.50+03 NE = 1.00+08 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.94-30	6.94-38	-4.39-37	-1.77-36	-4.65-36	-1.01-35	-1.95-35	-3.44-35	-5.64-35	-8.61-35	-1.22-34	-1.58-34	-1.90-34	-2.13-34
45	2.66-30	9.47-38	-6.09-37	-2.46-36	-6.49-36	-1.41-35	-2.74-35	-4.88-35	-8.07-35	-1.24-34	-1.78-34	-2.34-34	-2.85-34	-3.24-34
40	3.80-30	1.34-37	-8.79-37	-3.57-36	-9.46-36	-2.08-35	-4.06-35	-7.29-35	-1.22-34	-1.90-34	-2.76-34	-3.70-34	-4.59-34	-5.34-34
35	5.69-30	1.98-37	-1.34-36	-5.46-36	-1.46-35	-3.23-35	-6.40-35	-1.17-34	-1.99-34	-3.16-34	-4.68-34	-6.44-34	-8.23-34	-9.92-34
30	9.08-30	3.13-37	-2.18-36	-8.97-36	-2.43-35	-5.47-35	-1.11-34	-2.06-34	-3.60-34	-5.91-34	-9.08-34	-1.30-33	-1.75-33	-2.23-33
29	1.01-29	3.47-37	-2.43-36	-1.00-35	-2.72-35	-6.15-35	-1.25-34	-2.35-34	-4.13-34	-6.84-34	-1.06-33	-1.54-33	-2.09-33	-2.71-33
28	1.12-29	3.86-37	-2.72-36	-1.12-35	-3.06-35	-6.96-35	-1.42-34	-2.69-34	-4.77-34	-7.97-34	-1.25-33	-1.84-33	-2.54-33	-3.34-33
27	1.25-29	4.32-37	-3.05-36	-1.26-35	-3.46-35	-7.91-35	-1.63-34	-3.10-34	-5.55-34	-9.38-34	-1.49-33	-2.22-33	-3.13-33	-4.20-33
26	1.40-29	4.86-37	-3.43-36	-1.43-35	-3.93-35	-9.04-35	-1.87-34	-3.60-34	-6.52-34	-1.12-33	-1.80-33	-2.73-33	-3.91-33	-5.39-33
25	1.58-29	5.50-37	-3.88-36	-1.62-35	-4.49-35	-1.04-34	-2.17-34	-4.22-34	-7.73-34	-1.34-33	-2.20-33	-3.40-33	-5.00-33	-7.09-33
24	1.79-29	6.28-37	-4.40-36	-1.85-35	-5.15-35	-1.20-34	-2.54-34	-4.99-34	-9.27-34	-1.63-33	-2.73-33	-4.33-33	-6.54-33	-9.60-33
23	2.04-29	7.25-37	-5.01-36	-2.12-35	-5.95-35	-1.40-34	-2.99-34	-5.96-34	-1.12-33	-2.02-33	-3.46-33	-5.64-33	-8.81-33	-1.35-32
22	2.34-29	8.46-37	-5.72-36	-2.44-35	-6.91-35	-1.65-34	-3.56-34	-7.19-34	-1.38-33	-2.55-33	-4.48-33	-7.54-33	-1.23-32	-1.98-32
21	2.69-29	1.00-36	-6.55-36	-2.83-35	-8.08-35	-1.95-34	-4.27-34	-8.79-34	-1.73-33	-3.27-33	-5.94-33	-1.04-32	-1.79-32	-3.07-32
20	3.13-29	1.22-36	-7.45-36	-3.27-35	-9.45-35	-2.31-34	-5.15-34	-1.08-33	-2.19-33	-4.28-33	-8.11-33	-1.50-32	-2.74-32	-5.14-32
19	3.66-29	1.51-36	-8.48-36	-3.79-35	-1.11-34	-2.76-34	-6.30-34	-1.36-33	-2.84-33	-5.77-33	-1.15-32	-2.27-32	-4.54-32	-9.66-32
18	4.33-29	1.92-36	-9.59-36	-4.40-35	-1.31-34	-3.33-34	-7.77-34	-1.73-33	-3.76-33	-8.05-33	-1.72-32	-3.70-32	-8.40-32	-2.17-31
17	5.17-29	2.51-36	-1.07-35	-5.08-35	-1.55-34	-4.01-34	-9.66-34	-2.24-33	-5.11-33	-1.17-32	-2.73-32	-6.69-32	-1.84-31	-6.72-31
16	6.25-29	3.38-36	-1.16-35	-5.80-35	-1.81-34	-4.84-34	-1.21-33	-2.94-33	-7.18-33	-1.80-32	-4.77-32	-1.42-31	-5.53-31	-4.54-30
15	7.64-29	4.69-36	-1.20-35	-6.50-35	-2.10-34	-5.81-34	-1.52-33	-3.95-33	-1.05-32	-2.99-32	-9.67-32	-4.08-31	-3.59-30	
14	9.50-29	6.66-36	-1.15-35	-7.09-35	-2.40-34	-6.93-34	-1.93-33	-5.44-33	-1.64-32	-5.70-32	-2.61-31	-2.49-30		
13	1.20-28	9.60-36	-9.64-36	-7.50-35	-2.69-34	-8.23-34	-2.48-33	-7.89-33	-2.89-32	-1.42-31	-1.47-30			
12	1.55-28	1.39-35	-6.05-36	-7.74-35	-3.01-34	-9.94-34	-3.35-33	-1.28-32	-6.60-32	-7.30-31				
11	2.06-28	2.04-35	-1.42-37	-7.91-35	-3.46-34	-1.27-33	-5.10-33	-2.72-32	-3.12-31					
10	2.81-28	3.05-35	9.85-36	-7.96-35	-4.17-34	-1.82-33	-1.00-32	-1.18-31						
9	4.01-28	4.73-35	2.91-35	-7.13-35	-5.25-34	-3.11-33	-3.69-32							
8	6.01-28	7.80-35	7.25-35	-1.82-35	-5.83-34	-6.70-33								
7	9.70-28	1.41-34	1.88-34	2.83-34	1.74-33									
6	1.74-27	2.91-34	5.93-34	3.27-33										
5	3.73-27	7.63-34	3.35-33											
4	1.12-26	3.71-33												
3	8.09-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-2.25-34	-2.26-34	-2.15-34	-1.98-34	-1.61-34	-1.09-34	-4.96-35	2.59-35	1.21-34	2.40-34	3.88-34	5.74-34	8.07-34	1.10-33
45	-3.49-34	-3.57-34	-3.50-34	-3.26-34	-2.85-34	-2.13-34	-1.28-34	-1.32-35	1.38-34	3.37-34	5.99-34	9.43-34	1.40-33	2.01-33
40	-5.90-34	-6.24-34	-6.34-34	-6.20-34	-5.79-34	-4.84-34	-3.63-34	-1.85-34	7.42-35	4.45-34	9.79-34	1.75-33	2.89-33	4.59-33
35	-1.14-33	-1.26-33	-1.36-33	-1.42-33	-1.46-33	-1.39-33	-1.29-33	-1.06-33	-6.39-34	1.12-34	1.45-33	3.85-33	8.33-33	1.72-32
30	-2.23-33	-2.27-33	-2.86-33	-4.54-33	-5.33-33	-6.13-33	-7.25-33	-8.63-33	-1.03-32	-1.20-32	-1.26-32	-5.62-33	5.59-32	9.41-31
29	-3.39-33	-4.15-33	-5.03-33	-6.10-33	-7.45-33	-9.03-33	-1.14-32	-1.49-32	-2.01-32	-2.88-32	-4.40-32	-7.20-32	-3.12-32	
28	-4.27-33	-5.36-33	-6.71-33	-8.44-33	-1.08-32	-1.39-32	-1.91-32	-2.76-32	-4.38-32	-8.02-32	-1.92-31	-9.16-31		
27	-5.50-33	-7.12-33	-9.23-33	-1.22-32	-1.65-32	-2.29-32	-3.46-32	-5.78-32	-1.14-31	-3.07-31	-1.77-30			
26	-7.27-33	-9.74-33	-1.32-32	-1.83-32	-2.67-32	-4.08-32	-7.06-32	-1.45-31	-4.12-31	-2.58-30				
25	-9.89-33	-1.38-32	-1.97-32	-2.94-32	-4.69-32	-8.19-32	-1.74-31	-5.10-31	-3.30-30					
24	-1.40-32	-2.06-32	-3.14-32	-5.13-32	-9.30-32	-1.98-31	-5.97-31	-3.98-30						
23	-2.06-32	-3.25-32	-5.43-32	-1.01-31	-2.22-31	-6.71-31	-4.57-30							
22	-3.23-32	-5.57-32	-1.06-31	-2.38-31	-7.40-31	-5.07-30								
21	-5.49-32	-1.07-31	-2.47-31	-7.83-31	-5.43-30									
20	-1.04-31	-2.46-31	-7.97-31	-5.67-30										
19	-2.37-31	-7.92-31	-5.76-30											
18	-7.51-31	-5.63-30												
17	-5.22-30													

H TE = 7.50+03 NE = 1.00+09 CASE B NC = 20

TOTAL RC = 3.748-13 4-2 RC = 4.614-14 4-2 EM = 1.885-25 2S RC = 1.182-13 2P RC = 2.566-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.02-03	3.14-04	1.35-04	6.99-05	4.08-05	2.58-05	1.74-05	1.23-05	8.96-06	6.74-06	5.20-06	4.10-06	3.29-06	2.67-06
45	1.41-03	4.32-04	1.85-04	9.61-05	5.60-05	3.55-05	2.39-05	1.68-05	1.23-05	9.26-06	7.15-06	5.63-06	4.51-06	3.67-06
40	2.01-03	6.16-04	2.65-04	1.37-04	8.00-05	5.06-05	3.41-05	2.40-05	1.75-05	1.32-05	1.02-05	8.02-06	6.43-06	5.23-06
35	3.01-03	9.23-04	3.96-04	2.05-04	1.20-04	7.58-05	5.10-05	3.59-05	2.63-05	1.98-05	1.52-05	1.20-05	9.61-06	7.82-06
30	4.80-03	1.47-03	6.33-04	3.28-04	1.91-04	1.21-04	8.13-05	5.73-05	4.18-05	3.15-05	2.43-05	1.91-05	1.53-05	1.24-05
29	5.32-03	1.63-03	7.01-04	3.63-04	2.12-04	1.34-04	9.01-05	6.34-05	4.63-05	3.49-05	2.69-05	2.11-05	1.69-05	1.38-05
28	5.92-03	1.82-03	7.80-04	4.04-04	2.35-04	1.49-04	1.00-04	7.05-05	5.15-05	3.88-05	2.99-05	2.35-05	1.88-05	1.53-05
27	6.61-03	2.03-03	8.71-04	4.51-04	2.63-04	1.66-04	1.12-04	7.88-05	5.75-05	4.33-05	3.33-05	2.62-05	2.10-05	1.70-05
26	7.42-03	2.28-03	9.77-04	5.06-04	2.95-04	1.87-04	1.25-04	8.83-05	6.45-05	4.85-05	3.73-05	2.94-05	2.35-05	1.91-05
25	8.36-03	2.56-03	1.10-03	5.70-04	3.32-04	2.10-04	1.41-04	9.94-05	7.26-05	5.46-05	4.20-05	3.30-05	2.64-05	2.14-05
24	9.47-03	2.90-03	1.25-03	6.45-04	3.76-04	2.38-04	1.60-04	1.12-04	8.21-05	6.17-05	4.75-05	3.73-05	2.98-05	2.42-05
23	1.08-02	3.30-03	1.42-03	7.34-04	4.28-04	2.71-04	1.82-04	1.28-04	9.33-05	7.01-05	5.40-05	4.24-05	3.39-05	2.74-05
22	1.23-02	3.78-03	1.62-03	8.40-04	4.89-04	3.10-04	2.08-04	1.46-04	1.07-04	8.01-05	6.16-05	4.84-05	3.86-05	3.13-05
21	1.42-02	4.36-03	1.87-03	9.67-04	5.63-04	3.56-04	2.39-04	1.68-04	1.23-04	9.21-05	7.08-05	5.55-05	4.43-05	3.58-05
20	1.65-02	5.05-03	2.17-03	1.12-03	6.52-04	4.12-04	2.77-04	1.95-04	1.42-04	1.06-04	8.18-05	6.41-05	5.10-05	4.11-05
19	1.92-02	5.89-03	2.53-03	1.31-03	7.61-04	4.81-04	3.23-04	2.27-04	1.65-04	1.24-04	9.51-05	7.44-05	5.91-05	4.74-05
18	2.26-02	6.93-03	2.97-03	1.54-03	8.94-04	5.65-04	3.79-04	2.66-04	1.94-04	1.45-04	1.11-04	8.67-05	6.86-05	5.47-05
17	2.68-02	8.21-03	3.52-03	1.82-03	1.06-03	6.68-04	4.48-04	3.14-04	2.29-04	1.71-04	1.31-04	1.02-04	7.97-05	6.24-05
16	3.20-02	9.80-03	4.20-03	2.17-03	1.26-03	7.96-04	5.33-04	3.74-04	2.71-04	2.02-04	1.54-04	1.19-04	9.17-05	6.76-05
15	3.84-02	1.18-02	5.05-03	2.61-03	1.51-03	9.55-04	6.39-04	4.47-04	3.24-04	2.40-04	1.82-04	1.38-04	1.00-04	
14	4.65-02	1.42-02	6.09-03	3.14-03	1.83-03	1.15-03	7.68-04	5.36-04	3.87-04	2.85-04	2.12-04	1.51-04		
13	5.63-02	1.72-02	7.37-03	3.80-03	2.20-03	1.39-03	9.24-04	6.43-04	4.60-04	3.33-04	2.33-04			
12	6.80-02	2.08-02	8.89-03	4.58-03	2.65-03	1.67-03	1.11-03	7.63-04	5.37-04	3.66-04				
11	8.16-02	2.49-02	1.07-02	5.48-03	3.17-03	1.98-03	1.31-03	8.86-04	5.87-04					
10	9.76-02	2.98-02	1.27-02	6.53-03	3.76-03	2.34-03	1.51-03	9.67-04						
9	1.19-01	3.62-02	1.54-02	7.91-03	4.52-03	2.76-03	1.69-03							
8	1.52-01	4.63-02	1.97-02	1.00-02	5.64-03	3.25-03								
7	2.08-01	6.32-02	2.68-02	1.34-02	7.15-03									
6	3.07-01	9.32-02	3.91-02	1.86-02										
5	5.07-01	1.51-01	6.07-02											
4	1.00+00	2.75-01												
3	2.61+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.21-06	1.84-06	1.55-06	1.32-06	1.13-06	9.78-07	8.51-07	7.44-07	6.55-07	5.80-07	5.15-07	4.60-07	4.12-07	3.71-07
45	3.03-06	2.53-06	2.13-06	1.81-06	1.55-06	1.34-06	1.17-06	1.02-06	8.98-07	7.94-07	7.05-07	6.29-07	5.64-07	5.07-07
40	4.31-06	3.60-06	3.03-06	2.58-06	2.21-06	1.91-06	1.66-06	1.45-06	1.28-06	1.13-06	1.00-06	8.92-07	7.98-07	7.17-07
35	6.44-06	5.37-06	4.52-06	3.84-06	3.29-06	2.84-06	2.47-06	2.16-06	1.89-06	1.67-06	1.48-06	1.32-06	1.17-06	1.05-06
30	1.02-05	8.52-06	7.17-06	6.08-06	5.20-06	4.48-06	3.88-06	3.38-06	2.96-06	2.59-06	2.27-06	1.99-06	1.72-06	1.40-06
29	1.13-05	9.43-06	7.93-06	6.73-06	5.75-06	4.95-06	4.28-06	3.72-06	3.25-06	2.84-06	2.47-06	2.12-06	1.72-06	
28	1.26-05	1.05-05	8.80-06	7.46-06	6.37-06	5.48-06	4.73-06	4.11-06	3.57-06	3.09-06	2.65-06	2.14-06		
27	1.40-05	1.17-05	9.80-06	8.30-06	7.08-06	6.08-06	5.24-06	4.53-06	3.90-06	3.32-06	2.68-06			
26	1.57-05	1.30-05	1.09-05	9.26-06	7.89-06	6.76-06	5.80-06	4.97-06	4.22-06	3.38-06				
25	1.76-05	1.46-05	1.23-05	1.04-05	8.81-06	7.52-06	6.40-06	5.40-06	4.30-06					
24	1.99-05	1.65-05	1.38-05	1.16-05	9.85-06	8.34-06	6.98-06	5.54-06						
23	2.25-05	1.87-05	1.56-05	1.31-05	1.10-05	9.14-06	7.20-06							
22	2.56-05	2.12-05	1.76-05	1.47-05	1.21-05	9.48-06								
21	2.92-05	2.41-05	1.99-05	1.63-05	1.26-05									
20	3.35-05	2.74-05	2.22-05	1.71-05										
19	3.83-05	3.08-05	2.35-05											
18	4.34-05	3.28-05												
17	4.66-05													

H TE = 7.50+03 NE = 1.00+09 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.38-31	3.11-38	-4.93-37	-1.75-36	-4.35-36	-8.99-36	-1.61-35	-2.46-35	-3.15-35	-3.31-35	-2.79-35	-1.62-35	1.34-36	2.44-35
45	1.15-30	4.19-38	-6.83-37	-2.44-36	-6.08-36	-1.26-35	-2.27-35	-3.51-35	-4.53-35	-4.82-35	-4.15-35	-2.54-35	-5.33-37	3.30-35
40	1.64-30	5.82-38	-9.87-37	-3.54-36	-8.87-36	-1.86-35	-3.37-35	-5.26-35	-6.89-35	-7.47-35	-6.62-35	-4.34-35	-6.40-36	4.51-35
35	2.46-30	8.38-38	-1.51-36	-5.42-36	-1.37-35	-2.90-35	-5.34-35	-8.47-35	-1.13-34	-1.26-34	-1.17-34	-8.35-35	-2.54-35	6.03-35
30	3.92-30	1.26-37	-2.47-36	-8.97-36	-2.30-35	-4.95-35	-9.30-35	-1.52-34	-2.09-34	-2.44-34	-2.40-34	-1.93-34	-9.67-35	6.13-35
29	4.35-30	1.37-37	-2.76-36	-1.00-35	-2.58-35	-5.59-35	-1.06-34	-1.73-34	-2.41-34	-2.84-34	-2.85-34	-2.36-34	-1.29-34	5.23-35
28	4.84-30	1.50-37	-3.09-36	-1.13-35	-2.92-35	-6.34-35	-1.21-34	-1.99-34	-2.80-34	-3.35-34	-3.42-34	-2.92-34	-1.73-34	3.49-35
27	5.40-30	1.64-37	-3.48-36	-1.28-35	-3.31-35	-7.24-35	-1.39-34	-2.31-34	-3.29-34	-3.98-34	-4.15-34	-3.66-34	-2.36-34	4.15-36
26	6.06-30	1.80-37	-3.96-36	-1.45-35	-3.78-35	-8.32-35	-1.61-34	-2.70-34	-3.90-34	-4.79-34	-5.11-34	-4.68-34	-3.28-34	-5.02-35
25	6.83-30	1.98-37	-4.49-36	-1.66-35	-4.35-35	-9.64-35	-1.88-34	-3.20-34	-4.67-34	-5.85-34	-6.40-34	-6.09-34	-4.63-34	-1.45-34
24	7.74-30	2.19-37	-5.14-36	-1.91-35	-5.03-35	-1.13-34	-2.21-34	-3.82-34	-5.67-34	-7.26-34	-8.17-34	-8.12-34	-6.70-34	-3.12-34
23	8.81-30	2.42-37	-5.93-36	-2.21-35	-5.88-35	-1.33-34	-2.64-34	-4.62-34	-6.99-34	-9.17-34	-1.07-33	-1.11-33	-9.98-34	-6.14-34
22	1.01-29	2.69-37	-6.89-36	-2.58-35	-6.93-35	-1.58-34	-3.19-34	-5.68-34	-8.78-34	-1.18-33	-1.43-33	-1.57-33	-1.54-33	-1.19-33
21	1.16-29	3.01-37	-8.06-36	-3.04-35	-8.25-35	-1.91-34	-3.91-34	-7.10-34	-1.13-33	-1.57-33	-1.98-33	-2.31-33	-2.50-33	-2.33-33
20	1.35-29	3.41-37	-9.51-36	-3.62-35	-9.92-35	-2.33-34	-4.86-34	-9.05-34	-1.48-33	-2.14-33	-2.83-33	-3.55-33	-4.27-33	-4.79-33
19	1.58-29	3.89-37	-1.13-35	-4.35-35	-1.21-34	-2.89-34	-6.17-34	-1.18-33	-2.00-33	-3.03-33	-4.28-33	-5.84-33	-7.96-33	-1.10-32
18	1.87-29	4.54-37	-1.36-35	-5.29-35	-1.50-34	-3.65-34	-8.00-34	-1.58-33	-2.80-33	-4.50-33	-6.86-33	-1.04-32	-1.67-32	-2.99-32
17	2.24-29	5.48-37	-1.65-35	-6.52-35	-1.88-34	-4.70-34	-1.07-33	-2.20-33	-4.11-33	-7.11-33	-1.20-32	-2.11-32	-4.21-32	-1.12-31
16	2.70-29	6.95-37	-2.02-35	-8.12-35	-2.40-34	-6.19-34	-1.46-33	-3.19-33	-6.39-33	-1.22-32	-2.35-32	-5.11-32	-1.48-31	-9.21-31
15	3.30-29	9.47-37	-2.49-35	-1.03-34	-3.12-34	-8.37-34	-2.08-33	-4.86-33	-1.07-32	-2.33-32	-5.55-32	-1.73-31	-1.15-30	
14	4.10-29	1.42-36	-3.08-35	-1.31-34	-4.13-34	-1.17-33	-3.10-33	-7.96-33	-2.00-32	-5.35-32	-1.82-31	-1.29-30		
13	5.19-29	2.33-36	-3.78-35	-1.68-34	-5.56-34	-1.68-33	-4.89-33	-1.43-32	-4.42-32	-1.68-31	-1.30-30			
12	6.71-29	4.18-36	-4.55-35	-2.14-34	-7.57-34	-2.50-33	-8.31-33	-2.99-32	-1.32-31	-1.15-30				
11	8.89-29	7.89-36	-5.20-35	-2.69-34	-1.04-33	-3.88-33	-1.58-32	-8.14-32	-8.24-31					
10	1.22-28	1.51-35	-5.46-35	-3.28-34	-1.43-33	-6.52-33	-3.78-32	-4.46-31						
9	1.73-28	2.82-35	-5.07-35	-3.98-34	-2.11-33	-1.35-32	-1.77-31							
8	2.60-28	5.22-35	-3.83-35	-5.20-34	-3.90-33	-5.53-32								
7	4.19-28	1.01-34	-2.95-36	-8.30-34	-1.41-32									
6	7.54-28	2.22-34	1.47-34	-2.00-33										
5	1.61-27	6.31-34	1.34-33											
4	4.82-27	3.22-33												
3	3.50-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.33-35	8.86-35	1.31-34	1.83-34	2.44-34	3.20-34	4.10-34	5.20-34	6.52-34	8.14-34	1.01-33	1.26-33	1.56-33	1.93-33
45	7.58-35	1.29-34	1.95-34	2.77-34	3.77-34	5.04-34	6.60-34	8.54-34	1.10-33	1.41-33	1.80-33	2.31-33	2.97-33	3.83-33
40	1.13-34	2.01-34	3.13-34	4.56-34	6.40-34	8.81-34	1.19-33	1.60-33	2.14-33	2.87-33	3.86-33	5.23-33	7.18-33	9.99-33
35	1.79-34	3.40-34	5.58-34	8.54-34	1.26-33	1.83-33	2.62-33	3.76-33	5.43-33	7.95-33	1.19-32	1.83-32	2.93-32	4.95-32
30	3.02-34	6.60-34	1.20-33	2.01-33	3.26-33	5.30-33	8.66-33	1.45-32	2.55-32	4.82-32	1.01-31	2.55-31	8.93-31	6.90-30
29	3.36-34	7.71-34	1.44-33	2.49-33	4.19-33	7.06-33	1.21-32	2.16-32	4.11-32	8.73-32	2.21-31	7.78-31	6.10-30	
28	3.72-34	9.08-34	1.76-33	3.16-33	5.53-33	9.78-33	1.78-32	3.45-32	7.41-32	1.90-31	6.72-31	5.25-30		
27	4.10-34	1.08-33	2.20-33	4.13-33	7.59-33	1.43-32	2.84-32	6.19-32	1.60-31	5.74-31	4.55-30			
26	4.43-34	1.30-33	2.81-33	5.58-33	1.10-32	2.25-32	5.04-32	1.33-31	4.81-31	3.84-30				
25	4.60-34	1.58-33	3.70-33	7.92-33	1.70-32	3.95-32	1.07-31	3.94-31	3.19-30					
24	4.34-34	1.94-33	5.05-33	1.20-32	2.93-32	8.24-32	3.13-31	2.58-30						
23	3.04-34	2.38-33	7.25-33	1.99-32	5.96-32	2.37-31	2.02-30							
22	-9.27-35	2.85-33	1.12-32	3.86-32	1.65-31	1.47-30								
21	-1.19-33	3.05-33	1.92-32	1.01-31	1.01-30									
20	-4.30-33	1.39-33	4.05-32	5.50-31										
19	-1.52-32	-1.61-32	1.19-31											
18	-6.73-32	2.72-31												
17	-6.22-31													

H TE = 7.50+03 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 4.180-13 4-2 RC = 5.217-14 4-2 EM = 2.132-25 2S RC = 1.101-13 2P RC = 3.080-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.05-04	2.78-04	1.19-04	6.18-05	3.61-05	2.28-05	1.54-05	1.08-05	7.92-06	5.96-06	4.60-06	3.63-06	2.91-06	2.37-06
45	1.24-03	3.82-04	1.64-04	8.50-05	4.96-05	3.14-05	2.11-05	1.49-05	1.09-05	8.19-06	6.32-06	4.98-06	3.99-06	3.25-06
40	1.78-03	5.45-04	2.34-04	1.21-04	7.07-05	4.48-05	3.01-05	2.12-05	1.55-05	1.17-05	9.01-06	7.10-06	5.69-06	4.63-06
35	2.66-03	8.16-04	3.51-04	1.82-04	1.06-04	6.71-05	4.51-05	3.18-05	2.32-05	1.75-05	1.35-05	1.06-05	8.50-06	6.92-06
30	4.25-03	1.30-03	5.60-04	2.90-04	1.69-04	1.07-04	7.20-05	5.07-05	3.70-05	2.79-05	2.15-05	1.69-05	1.35-05	1.10-05
29	4.71-03	1.45-03	6.21-04	3.21-04	1.87-04	1.19-04	7.98-05	5.62-05	4.10-05	3.09-05	2.38-05	1.87-05	1.50-05	1.22-05
28	5.24-03	1.61-03	6.91-04	3.58-04	2.09-04	1.32-04	8.87-05	6.25-05	4.56-05	3.43-05	2.65-05	2.08-05	1.67-05	1.35-05
27	5.86-03	1.80-03	7.72-04	4.00-04	2.33-04	1.47-04	9.91-05	6.98-05	5.10-05	3.83-05	2.95-05	2.32-05	1.86-05	1.51-05
26	6.58-03	2.02-03	8.66-04	4.48-04	2.61-04	1.65-04	1.11-04	7.83-05	5.71-05	4.30-05	3.31-05	2.60-05	2.08-05	1.69-05
25	7.42-03	2.27-03	9.76-04	5.05-04	2.95-04	1.86-04	1.25-04	8.82-05	6.44-05	4.84-05	3.73-05	2.93-05	2.34-05	1.90-05
24	8.40-03	2.58-03	1.11-03	5.72-04	3.34-04	2.11-04	1.42-04	9.98-05	7.29-05	5.48-05	4.22-05	3.31-05	2.65-05	2.15-05
23	9.57-03	2.94-03	1.26-03	6.52-04	3.80-04	2.40-04	1.62-04	1.14-04	8.29-05	6.23-05	4.80-05	3.77-05	3.01-05	2.44-05
22	1.10-02	3.36-03	1.44-03	7.47-04	4.35-04	2.75-04	1.85-04	1.30-04	9.49-05	7.13-05	5.48-05	4.31-05	3.44-05	2.78-05
21	1.27-02	3.88-03	1.67-03	8.62-04	5.02-04	3.18-04	2.13-04	1.50-04	1.09-04	8.21-05	6.31-05	4.95-05	3.95-05	3.19-05
20	1.47-02	4.51-03	1.94-03	1.00-03	5.83-04	3.69-04	2.48-04	1.74-04	1.27-04	9.52-05	7.31-05	5.73-05	4.56-05	3.68-05
19	1.73-02	5.29-03	2.27-03	1.17-03	6.83-04	4.32-04	2.90-04	2.03-04	1.48-04	1.11-04	8.53-05	6.67-05	5.30-05	4.25-05
18	2.08-02	6.25-03	2.68-03	1.39-03	8.07-04	5.10-04	3.42-04	2.40-04	1.75-04	1.31-04	1.00-04	7.82-05	6.19-05	4.93-05
17	2.44-02	7.46-03	3.20-03	1.65-03	9.62-04	6.07-04	4.07-04	2.86-04	2.08-04	1.55-04	1.19-04	9.22-05	7.24-05	5.67-05
16	2.94-02	9.00-03	3.86-03	1.99-03	1.16-03	7.32-04	4.90-04	3.43-04	2.49-04	1.86-04	1.42-04	1.09-04	8.42-05	6.21-05
15	3.59-02	1.10-02	4.71-03	2.43-03	1.41-03	8.91-04	5.96-04	4.17-04	3.02-04	2.24-04	1.70-04	1.29-04	9.33-05	
14	4.45-02	1.36-02	5.83-03	3.01-03	1.75-03	1.10-03	7.35-04	5.13-04	3.70-04	2.73-04	2.03-04	1.44-04		
13	5.59-02	1.71-02	7.31-03	3.77-03	2.19-03	1.38-03	9.16-04	6.37-04	4.56-04	3.30-04	2.31-04			
12	7.12-02	2.18-02	9.31-03	4.79-03	2.78-03	1.74-03	1.16-03	7.97-04	5.61-04	3.82-04				
11	9.19-02	2.81-02	1.20-02	6.16-03	3.56-03	2.22-03	1.47-03	9.94-04	6.58-04					
10	1.20-01	3.69-02	1.56-02	7.98-03	4.59-03	2.85-03	1.84-03	1.18-03						
9	1.55-01	4.71-02	2.01-02	1.02-02	5.85-03	3.57-03	2.17-03							
8	1.97-01	5.97-02	2.53-02	1.28-02	7.21-03	4.14-03								
7	2.49-01	7.54-02	3.17-02	1.58-02	8.37-03									
6	3.39-01	1.02-01	4.23-02	1.99-02										
5	5.30-01	1.57-01	6.13-02											
4	1.00+00	2.76-01												
3	2.59+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.95-06	1.63-06	1.37-06	1.17-06	1.00-06	8.65-07	7.52-07	6.58-07	5.79-07	5.13-07	4.56-07	4.07-07	3.64-07	3.28-07
45	2.68-06	2.23-06	1.88-06	1.60-06	1.37-06	1.19-06	1.03-06	9.02-07	7.94-07	7.02-07	6.24-07	5.57-07	4.99-07	4.48-07
40	3.82-06	3.18-06	2.68-06	2.28-06	1.95-06	1.69-06	1.47-06	1.28-06	1.13-06	9.97-07	8.85-07	7.89-07	7.06-07	6.34-07
35	5.70-06	4.75-06	4.00-06	3.40-06	2.91-06	2.51-06	2.18-06	1.91-06	1.68-06	1.48-06	1.31-06	1.16-06	1.04-06	9.29-07
30	9.06-06	7.56-06	6.35-06	5.39-06	4.61-06	3.97-06	3.44-06	2.99-06	2.62-06	2.29-06	2.01-06	1.76-06	1.52-06	1.24-06
29	1.00-05	8.35-06	7.02-06	5.96-06	5.09-06	4.38-06	3.79-06	3.30-06	2.88-06	2.51-06	2.19-06	1.88-06	1.53-06	
28	1.11-05	9.27-06	7.79-06	6.61-06	5.64-06	4.85-06	4.19-06	3.64-06	3.16-	2.74-06	2.34-06	1.90-06		
27	1.24-05	1.03-05	8.68-06	7.35-06	6.27-06	5.38-06	4.64-06	4.01-06	3.46-06	2.95-06	2.37-06			
26	1.39-05	1.16-05	9.70-06	8.21-06	6.99-06	5.99-06	5.14-06	4.41-06	3.74-06	2.99-06				
25	1.56-05	1.30-05	1.09-05	9.20-06	7.82-06	6.67-06	5.68-06	4.79-06	3.82-06					
24	1.76-05	1.46-05	1.23-05	1.03-05	8.74-06	7.40-06	6.20-06	4.91-06						
23	2.00-05	1.66-05	1.38-05	1.16-05	9.76-06	8.12-06	6.40-06							
22	2.28-05	1.88-05	1.57-05	1.31-05	1.08-05	8.44-06								
21	2.61-05	2.15-05	1.77-05	1.45-05	1.13-05									
20	2.99-05	2.46-05	1.98-05	1.53-05										
19	3.44-05	2.76-05	2.11-05											
18	3.91-05	2.96-05												
17	4.24-05													

H TE = 7.50+03 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.35-31	-2.24-38	-4.63-37	-1.46-36	-3.18-36	-4.86-36	-4.11-36	6.98-37	9.17-36	2.07-35	3.50-35	5.25-35	7.36-35	9.90-35
45	1.85-31	-3.16-38	-6.42-37	-2.03-36	-4.45-36	-6.85-36	-5.90-36	7.67-37	1.27-35	2.90-35	4.98-35	7.53-35	1.07-34	1.45-34
40	2.64-31	-4.68-38	-9.28-37	-2.94-36	-6.51-36	-1.01-35	-8.93-36	6.84-37	1.83-35	4.28-35	7.45-35	1.14-34	1.65-34	2.27-34
35	3.95-31	-7.38-38	-1.42-36	-4.52-36	-1.01-35	-1.60-35	-1.46-35	2.59-38	2.76-35	6.73-35	1.20-34	1.88-34	2.77-34	3.92-34
30	6.31-31	-1.27-37	-2.33-36	-7.51-36	-1.71-35	-2.76-35	-2.65-35	-2.82-36	4.45-35	1.16-34	2.14-34	3.49-34	5.34-34	7.89-34
29	6.99-31	-1.44-37	-2.60-36	-8.41-36	-1.92-35	-3.13-35	-3.04-35	-4.07-36	4.94-35	1.31-34	2.45-34	4.04-34	6.24-34	9.33-34
28	7.78-31	-1.63-37	-2.92-36	-9.47-36	-2.17-35	-3.56-35	-3.51-35	-5.75-36	5.50-35	1.49-34	2.82-34	4.71-34	7.36-34	1.12-33
27	8.69-31	-1.86-37	-3.29-36	-1.07-35	-2.47-35	-4.08-35	-4.09-35	-8.03-36	6.14-35	1.70-34	3.28-34	5.54-34	8.80-34	1.36-33
26	9.74-31	-2.14-37	-3.73-36	-1.22-35	-2.83-35	-4.72-35	-4.81-35	-1.12-35	6.88-35	1.96-34	3.85-34	6.60-34	1.07-33	1.68-33
25	1.10-30	-2.48-37	-4.25-36	-1.40-35	-3.26-35	-5.49-35	-5.71-35	-1.55-35	7.72-35	2.28-34	4.56-34	7.97-34	1.32-33	2.12-33
24	1.24-30	-2.90-37	-4.88-36	-1.61-35	-3.79-35	-6.46-35	-6.86-35	-2.16-35	8.68-35	2.67-34	5.48-34	9.79-34	1.65-33	2.74-33
23	1.42-30	-3.41-37	-5.64-36	-1.87-35	-4.44-35	-7.67-35	-8.35-35	-3.02-35	9.75-35	3.17-34	6.67-34	1.23-33	2.13-33	3.67-33
22	1.62-30	-4.05-37	-6.58-36	-2.20-35	-5.27-35	-9.22-35	-1.03-34	-4.28-35	1.09-34	3.80-34	8.27-34	1.57-33	2.84-33	5.11-33
21	1.87-30	-4.86-37	-7.73-36	-2.60-35	-6.31-35	-1.12-34	-1.29-34	-6.14-35	1.22-34	4.61-34	1.05-33	2.07-33	3.93-33	7.51-33
20	2.17-30	-5.89-37	-9.18-36	-3.12-35	-7.66-35	-1.39-34	-1.66-34	-8.96-35	1.33-34	5.69-34	1.36-33	2.83-33	5.72-33	1.19-32
19	2.55-30	-7.24-37	-1.10-35	-3.79-35	-9.44-35	-1.75-34	-2.17-34	-1.34-34	1.40-34	7.12-34	1.83-33	4.07-33	8.96-33	2.10-32
18	3.01-30	-9.02-37	-1.34-35	-4.67-35	-1.18-34	-2.26-34	-2.93-34	-2.06-34	1.35-34	9.09-34	2.56-33	6.27-33	1.56-32	4.41-32
17	3.59-30	-1.14-36	-1.66-35	-5.85-35	-1.52-34	-2.99-34	-4.09-34	-3.29-34	9.61-35	1.18-33	3.80-33	1.06-32	3.21-32	1.28-31
16	4.34-30	-1.46-36	-2.08-35	-7.47-35	-1.99-34	-4.08-34	-5.93-34	-5.51-34	-2.87-35	1.56-33	6.12-33	2.12-32	9.05-32	8.07-31
15	5.31-30	-1.91-36	-2.66-35	-9.78-35	-2.69-34	-5.78-34	-9.06-34	-9.79-34	-3.89-34	2.04-33	1.12-32	5.67-32	5.51-31	
14	6.60-30	-2.54-36	-3.48-35	-1.31-34	-3.77-34	-8.59-34	-1.48-33	-1.89-33	-1.48-33	2.30-33	2.60-32	3.18-31		
13	8.35-30	-3.42-36	-4.66-35	-1.83-34	-5.52-34	-1.36-33	-2.62-33	-4.11-33	-5.29-33	-1.19-33	1.07-31			
12	1.08-29	-4.64-36	-6.41-35	-2.63-34	-8.54-34	-2.32-33	-5.25-33	-1.07-32	-2.38-32	-7.65-32				
11	1.43-29	-6.23-36	-9.05-35	-3.96-34	-1.41-33	-4.43-33	-1.26-32	-3.89-32	-2.23-31					
10	1.96-29	-7.85-36	-1.30-34	-6.24-34	-2.55-33	-9.95-33	-4.15-32	-3.06-31						
9	2.78-29	-7.84-36	-1.86-34	-1.02-33	-5.17-33	-2.94-32	-2.89-31							
8	4.18-29	-7.65-37	-2.53-34	-1.74-33	-1.28-32	-1.70-31								
7	6.74-29	2.55-35	-3.13-34	-3.27-33	-5.57-32									
6	1.21-28	9.90-35	-3.78-34	-1.07-32										
5	2.59-28	3.59-34	-3.54-34											
4	7.76-28	2.29-33												
3	5.62-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.30-34	1.67-34	2.11-34	2.64-34	3.29-34	4.07-34	5.01-34	6.14-34	7.52-34	9.21-34	1.13-33	1.38-33	1.69-33	2.08-33
45	1.92-34	2.50-34	3.21-34	4.08-34	5.15-34	6.49-34	8.14-34	1.02-33	1.28-33	1.61-33	2.02-33	2.55-33	3.24-33	4.15-33
40	3.06-34	4.05-34	5.31-34	6.90-34	8.94-34	1.16-33	1.50-33	1.94-33	2.53-33	3.32-33	4.39-33	5.86-33	7.94-33	1.10-32
35	5.42-34	7.40-34	1.00-33	1.35-33	1.83-33	2.48-33	3.39-33	4.69-33	6.58-33	9.41-33	1.38-32	2.09-32	3.30-32	5.53-32
30	1.14-33	1.65-33	2.38-33	3.45-33	5.08-33	7.65-33	1.18-32	1.91-32	3.24-32	5.96-32	1.23-31	3.03-31	1.04-30	8.01-30
29	1.37-33	2.01-33	2.96-33	4.39-33	6.66-33	1.04-32	1.68-32	2.87-32	5.30-32	1.09-31	2.71-31	9.36-31	7.17-30	
28	1.67-33	2.50-33	3.76-33	5.75-33	9.02-33	1.47-32	2.53-32	4.68-32	9.72-32	2.42-31	8.38-31	6.45-30		
27	2.07-33	3.17-33	4.90-33	7.77-33	1.28-32	2.21-32	4.11-32	8.57-32	2.14-31	7.44-31	5.75-30			
26	2.62-33	4.12-33	6.62-33	1.10-32	1.91-32	3.58-32	7.51-32	1.88-31	6.58-31	5.09-30				
25	3.41-33	5.55-33	9.32-33	1.64-32	3.09-32	6.53-32	1.65-31	5.77-31	4.49-30					
24	4.57-33	7.80-33	1.39-32	2.65-32	5.62-32	1.43-31	5.03-31	3.92-30						
23	6.40-33	1.16-32	2.23-32	4.79-32	1.22-31	4.34-31	3.41-30							
22	9.46-33	1.86-32	4.03-32	1.04-31	3.71-31	2.93-30								
21	1.51-32	3.33-32	8.70-32	3.14-31	2.50-30									
20	2.69-32	7.15-32	2.61-31	2.10-30										
19	5.72-32	2.13-31	1.73-30											
18	1.68-31	1.40-30												
17	1.09-30													

H TE = 1.00+04 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 2.584-13 4-2 RC = 3.022-14 4-2 EM = 1.235-25 2S RC = 8.373-14 2P RC = 1.747-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.87-04	1.87-04	8.35-05	4.48-05	2.69-05	1.75-05	1.20-05	8.61-06	6.39-06	4.88-06	3.81-06	3.03-06	2.45-06	2.01-06
45	7.43-04	2.40-04	1.09-04	5.94-05	3.61-05	2.37-05	1.64-05	1.18-05	8.83-06	6.77-06	5.30-06	4.23-06	3.43-06	2.82-06
40	9.77-04	3.20-04	1.49-04	8.24-05	5.07-05	3.36-05	2.34-05	1.70-05	1.27-05	9.80-06	7.70-06	6.16-06	5.00-06	4.12-06
35	1.36-03	4.53-04	2.15-04	1.21-04	7.53-05	5.03-05	3.53-05	2.57-05	1.93-05	1.49-05	1.17-05	9.38-06	7.63-06	6.28-06
30	2.05-03	6.95-04	3.36-04	1.91-04	1.20-04	8.04-05	5.66-05	4.13-05	3.11-05	2 40-05	1.89-05	1.51-05	1.23-05	1.01-05
29	2.25-03	7.66-04	3.71-04	2.11-04	1.33-04	8.91-05	6.27-05	4.58-05	3.45-05	2.66-05	2.10-05	1.68-05	1.36-05	1.12-05
28	2.49-03	8.48-04	4.11-04	2.35-04	1.48-04	9.91-05	6.98-05	5.10-05	3.84-05	2.96-05	2.33-05	1.87-05	1.52-05	1.25-05
27	2.76-03	9.42-04	4.58-04	2.62-04	1.65-04	1.11-04	7.80-05	5.70-05	4.29-05	3.31-05	2.61-05	2.09-05	1.69-05	1.39-05
26	3.07-03	1.05-03	5.12-04	2.93-04	1.85-04	1.24-04	8.74-05	6.39-05	4.82-05	3.71-05	2.92-05	2.34-05	1.90-05	1.56-05
25	3.44-03	1.18-03	5.76-04	3.30-04	2.08-04	1.40-04	9.85-05	7.20-05	5.42-05	4.18-05	3.29-05	2.64-05	2.14-05	1.76-05
24	3.87-03	1.33-03	6.50-04	3.73-04	2.35-04	1.58-04	1.11-04	8.15-05	6.14-05	4.74-05	3.73-05	2.98-05	2.42-05	1.99-05
23	4.38-03	1.51-03	7.39-04	4.24-04	2.67-04	1.80-04	1.27-04	9.28-05	6.99-05	5.39-05	4.24-05	3.39-05	2.75-05	2.26-05
22	4.99-03	1.72-03	8.44-04	4.84-04	3.05-04	2.06-04	1.45-04	1.06-04	8.00-05	6.17-05	4.85-05	3.88-05	3.14-05	2.57-05
21	5.73-03	1.98-03	9.70-04	5.57-04	3.51-04	2.37-04	1.67-04	1.22-04	9.21-05	7.10-05	5.58-05	4.46-05	3.61-05	2.95-05
20	6.62-03	2.29-03	1.12-03	6.45-04	4.07-04	2.74-04	1.94-04	1.42-04	1.07-04	8.23-05	6.47-05	5.16-05	4.17-05	3.40-05
19	7.71-03	2.67-03	1.31-03	7.52-04	4.75-04	3.20-04	2.26-04	1.66-04	1.25-04	9.61-05	7.54-05	6.01-05	4.84-05	3.93-05
18	9.05-03	3.13-03	1.54-03	8.85-04	5.60-04	3.77-04	2.66-04	1.95-04	1.47-04	1.13-04	8.87-05	7.05-05	5.66-05	4.55-05
17	1.07-02	3.72-03	1.83-03	1.05-03	6.66-04	4.49-04	3.17-04	2.32-04	1.75-04	1.34-04	1.05-04	8.32-05	6.62-05	5.22-05
16	1.29-02	4.46-03	2.19-03	1.26-03	8.00-04	5.40-04	3.81-04	2.79-04	2.10-04	1.61-04	1.26-04	9.86-05	7.69-05	5.66-05
15	1.56-02	5.41-03	2.66-03	1.54-03	9.73-04	6.57-04	4.64-04	3.39-04	2.55-04	1.95-04	1.51-04	1.16-04	8.45-05	
14	1.92-02	6.66-03	3.28-03	1.89-03	1.20-03	8.11-04	5.73-04	4.19-04	3.13-04	2.38-04	1.81-04	1.30-04		
13	2.40-02	8.32-03	4.10-03	2.37-03	1.51-03	1.02-03	7.18-04	5.24-04	3.89-04	2.90-04	2.06-04			
12	3.05-02	1.06-02	5.23-03	3.03-03	1.92-03	1.30-03	9.17-04	6.65-04	4.86-04	3.39-04				
11	3.97-02	1.38-02	6.82-03	3.96-03	2.52-03	1.70-03	1.19-03	8.51-04	5.82-04					
10	5.30-02	1.84-02	9.14-03	5.31-03	3.38-03	2.27-03	1.57-03	1.05-03						
9	7.31-02	2.54-02	1.26-02	7.37-03	4.68-03	3.12-03	2.03-03							
8	1.05-01	3.66-02	1.83-02	1.06-02	6.72-03	4.23-03								
7	1.59-01	5.55-02	2.78-02	1.62-02	9.73-03									
6	2.59-01	9.04-02	4.54-02	2.55-02										
5	4.68-01	1.63-01	8.01-02											
4	1.00+00	3.38-01												
3	2.86+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.67-06	1.41-06	1.19-06	1.02-06	8.78-07	7.62-07	6.66-07	5.85-07	5.16-07	4.58-07	4.08-07	3.65-07	3.28-07	2.96-07
45	2.35-06	1.98-06	1.68-06	1.43-06	1.24-06	1.07-06	9.39-07	8.25-07	7.28-07	6.46-07	5.76-07	5.15-07	4.63-07	4.17-07
40	3.43-06	2.89-06	2.45-06	2.10-06	1.81-06	1.57-06	1.37-06	1.20-06	1.06-06	9.42-07	8.38-07	7.49-07	6.71-07	6.03-07
35	5.23-06	4.40-06	3.73-06	3.19-06	2.75-06	2.39-06	2.08-06	1.82-06	1.60-06	1.42-06	1.26-06	1.12-06	9.99-07	8.92-07
30	8.41-06	7.07-06	5.99-06	5.11-06	4.40-06	3.80-06	3.30-06	2.88-06	2.52-06	2.21-06	1.93-06	1.69-06	1.45-06	1.17-06
29	9.33-06	7.83-06	6.64-06	5.66-06	4.86-06	4.20-06	3.64-06	3.17-06	2.76-06	2.41-06	2.09-06	1.79-06	1.44-06	
28	1.04-05	8.71-06	7.37-06	6.29-06	5.39-06	4.65-06	4.02-06	3.49-06	3.03-06	2.62-06	2.23-06	1.79-06		
27	1.16-05	9.72-06	8.22-06	7.00-06	5.99-06	5.16-06	4.46-06	3.84-06	3.31-06	2.80-06	2.24-06			
26	1.30-05	1.09-05	9.19-06	7.82-06	6.68-06	5.73-06	4.92-06	4.21-06	3.55-06	2.82-06				
25	1.46-05	1.22-05	1.03-05	8.75-06	7.46-06	6.36-06	5.42-06	4.54-06	3.59-06					
24	1.65-05	1.38-05	1.16-05	9.82-06	8.33-06	7.04-06	5.88-06	4.62-06						
23	1.87-05	1.56-05	1.31-05	1.10-05	9.27-06	7.68-06	6.00-06							
22	2.13-05	1.77-05	1.48-05	1.24-05	1.02-05	7.89-06								
21	2.43-05	2.02-05	1.67-05	1.37-05	1.05-05									
20	2.79-05	2.29-05	1.86-05	1.42-05										
19	3.20-05	2.57-05	1.95-05											
18	3.63-05	2.73-05												
17	3.89-05													

H TE = 1.00+04 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.43-37	1.38-37	1.43-37	1.67-37	2.71-37	5.82-37	1.31-36	2.77-36	5.41-36	9.86-36	1.70-35	2.78-35	4.40-35
45	0.00+00	2.05-37	2.23-37	2.88-37	4.19-37	6.99-37	1.28-36	2.41-36	4.46-36	7.93-36	1.35-35	2.23-35	3.54-35	5.47-35
40	0.00+00	2.99-37	3.56-37	5.16-37	8.12-37	1.34-36	2.29-36	3.91-36	6.58-36	1.08-35	1.74-35	2.74-35	4.21-35	6.35-35
35	0.00+00	4.49-37	5.62-37	8.65-37	1.40-36	2.28-36	3.68-36	5.87-36	9.19-36	1.42-35	2.14-35	3.20-35	4.71-35	6.87-35
30	0.00+00	7.09-37	9.09-37	1.44-36	2.34-36	3.76-36	5.88-36	8.95-36	1.33-35	1.93-35	2.74-35	3.84-35	5.30-35	7.23-35
29	0.00+00	7.85-37	1.01-36	1.60-36	2.61-36	4.19-36	6.53-36	9.89-36	1.46-35	2.09-35	2.94-35	4.06-35	5.51-35	7.33-35
28	0.00+00	8.71-37	1.12-36	1.79-36	2.92-36	4.69-36	7.30-36	1.10-35	1.61-35	2.30-35	3.20-35	4.34-35	5.77-35	7.45-35
27	0.00+00	9.71-37	1.25-36	2.00-36	3.29-36	5.28-36	8.21-36	1.24-35	1.80-35	2.55-35	3.51-35	4.70-35	6.09-35	7.55-35
26	0.00+00	1.09-36	1.41-36	2.26-36	3.72-36	5.99-36	9.33-36	1.40-35	2.04-35	2.87-35	3.92-35	5.17-35	6.50-35	7.61-35
25	0.00+00	1.23-36	1.59-36	2.56-36	4.24-36	6.85-36	1.07-35	1.61-35	2.34-35	3.29-35	4.46-35	5.77-35	7.00-35	7.52-35
24	0.00+00	1.39-36	1.80-36	2.92-36	4.86-36	7.90-36	1.24-35	1.87-35	2.73-35	3.83-35	5.15-35	6.56-35	7.58-35	7.06-35
23	0.00+00	1.58-36	2.06-36	3.36-36	5.63-36	9.21-36	1.45-35	2.21-35	3.23-35	4.54-35	6.08-35	7.57-35	8.19-35	5.65-35
22	0.00+00	1.81-36	2.38-36	3.90-36	6.57-36	1.08-35	1.73-35	2.64-35	3.89-35	5.50-35	7.33-35	8.89-35	8.60-35	1.93-35
21	0.00+00	2.09-36	2.76-36	4.56-36	7.76-36	1.29-35	2.08-35	3.22-35	4.79-35	6.80-35	9.02-35	1.05-34	8.18-35	-7.78-35
20	0.00+00	2.44-36	3.23-36	5.38-36	9.27-36	1.56-35	2.55-35	4.00-35	6.02-35	8.61-35	1.14-34	1.24-34	5.00-35	-3.45-34
19	0.00+00	2.86-36	3.82-36	6.43-36	1.12-35	1.92-35	3.18-35	5.07-35	7.76-35	1.12-34	1.46-34	1.38-34	-7.28-35	-1.17-33
18	0.00+00	3.40-36	4.57-36	7.79-36	1.38-35	2.40-35	4.05-35	6.60-35	1.03-34	1.50-34	1.89-34	1.20-34	-5.27-34	-4.31-33
17	0.00+00	4.07-36	5.53-36	9.56-36	1.73-35	3.07-35	5.30-35	8.85-35	1.41-34	2.08-34	2.39-34	-5.87-35	-2.47-33	-2.19-32
16	0.00+00	4.94-36	6.79-36	1.19-35	2.20-35	4.02-35	7.15-35	1.23-34	2.03-34	2.97-34	2.51-34	-1.08-33	-1.44-32	-2.62-31
15	0.00+00	6.09-36	8.47-36	1.52-35	2.89-35	5.44-35	1.00-34	1.80-34	3.06-34	4.25-34	-1.07-34	-8.44-33	-1.91-31	
14	0.00+00	7.62-36	1.08-35	1.99-35	3.90-35	7.66-35	1.48-34	2.80-34	4.89-34	5.05-34	-3.98-33	-1.31-31		
13	0.00+00	9.73-36	1.41-35	2.68-35	5.49-35	1.14-34	2.35-34	4.74-34	8.17-34	-8.91-34	-8.19-32			
12	0.00+00	1.27-35	1.89-35	3.76-35	8.13-35	1.81-34	4.09-34	8.99-34	1.00-33	-4.42-32				
11	0.00+00	1.71-35	2.64-35	5.54-35	1.30-34	3.20-34	8.25-34	1.92-33	-1.75-32					
10	0.00+00	2.39-35	3.86-35	8.76-35	2.30-34	6.66-34	2.11-33	-8.24-34						
9	0.00+00	3.51-35	6.04-35	1.54-34	4.82-34	1.85-33	7.51-33							
8	0.00+00	5.49-35	1.04-34	3.19-34	1.38-33	9.73-33								
7	0.00+00	9.43-35	2.11-34	9.06-34	8.32-33									
6	0.00+00	1.88-34	5.70-34	5.56-33										
5	0.00+00	4.93-34	3.21-33											
4	0.00+00	2.49-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.73-35	1.00-34	1.46-34	2.10-34	2.96-34	4.13-34	5.69-34	7.77-34	1.05-33	1.42-33	1.91-33	2.55-33	3.41-33	4.55-33
45	8.25-35	1.22-34	1.77-34	2.54-34	3.59-34	5.02-34	6.98-34	9.64-34	1.33-33	1.82-33	2.49-33	3.41-33	4.67-33	6.43-33
40	9.42-35	1.38-34	1.99-34	2.85-34	4.04-34	5.71-34	8.03-34	1.13-33	1.59-33	2.23-33	3.16-33	4.50-33	6.48-33	9.44-33
35	9.93-35	1.42-34	2.03-34	2.90-34	4.12-34	5.87-34	8.39-34	1.21-33	1.75-33	2.57-33	3.84-33	5.88-33	9.29-33	1.54-32
30	9.73-35	1.30-34	1.70-34	2.20-34	2.76-34	3.31-34	3.56-34	2.74-34	-1.35-34	-1.54-33	-6.20-33	-2.36-32	-1.10-31	-1.00-30
29	9.57-35	1.22-34	1.50-34	1.73-34	1.75-34	1.16-34	-1.09-34	-7.76-34	-2.69-33	-8.53-33	-2.93-32	-1.31-31	-1.20-30	
28	9.27-35	1.09-34	1.16-34	9.30-35	-5.61-36	-2.94-34	-1.07-33	-3.19-33	-9.47-33	-3.15-32	-1.39-31	-1.28-30		
27	8.73-35	8.80-35	5.77-35	-4.99-35	-3.48-34	-1.13-33	-3.25-33	-9.48-33	-3.13-32	-1.38-31	-1.30-30			
26	7.74-35	5.08-35	-4.66-35	-3.20-34	-1.04-33	-3.01-33	-8.85-33	-2.95-32	-1.31-31	-1.26-30				
25	5.82-35	-1.80-35	-2.46-34	-8.70-34	-2.60-33	-7.84-33	-2.66-32	-1.21-31	-1.18-30					
24	1.97-35	-1.54-34	-6.58-34	-2.11-33	-6.63-33	-2.32-32	-1.08-31	-1.09-30						
23	-6.13-35	-4.42-34	-1.60-33	-5.36-33	-1.95-32	-9.43-32	-9.79-31							
22	-2.44-34	-1.12-33	-4.12-33	-1.59-32	-8.01-32	-8.65-31								
21	-6.97-34	-2.98-33	-1.25-32	-6.63-32	-7.50-31									
20	-1.99-33	-9.33-33	-5.33-32	-6.39-31										
19	-6.60-33	-4.14-32	-5.32-31											
18	-3.09-32	-4.33-31												
17	-3.43-31													

H TE = 1.00+04 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 2.587-13 4-2 RC = 3.026-14 4-2 EM = 1.237-25 2S RC = 8.390-14 2P RC = 1.748-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.08-04	2.19-04	9.47-05	4.94-05	2.90-05	1.85-05	1.25-05	8.83-06	6.48-06	4.90-06	3.79-06	2.99-06	2.41-06	1.96-06
45	9.19-04	2.86-04	1.24-04	6.53-05	3.85-05	2.46-05	1.67-05	1.18-05	8.71-06	6.59-06	5.11-06	4.05-06	3.26-06	2.66-06
40	1.22-03	3.83-04	1.69-04	8.93-05	5.31-05	3.42-05	2.33-05	1.66-05	1.23-05	9.34-06	7.26-06	5.76-06	4.65-06	3.80-06
35	1.65-03	5.27-04	2.37-04	1.28-04	7.68-05	5.00-05	3.44-05	2.47-05	1.84-05	1.40-05	1.10-05	8.73-06	7.07-06	5.80-06
30	2.35-03	7.67-04	3.54-04	1.95-04	1.19-04	7.88-05	5.48-05	3.97-05	2.97-05	2.28-05	1.79-05	1.43-05	1.16-05	9.51-06
29	2.55-03	8.35-04	3.88-04	2.14-04	1.32-04	8.72-05	6.08-05	4.41-05	3.30-05	2.54-05	1.99-05	1.59-05	1.29-05	1.06-05
28	2.78-03	9.13-04	4.26-04	2.37-04	1.46-04	9.70-05	6.77-05	4.92-05	3.69-05	2.83-05	2.22-05	1.78-05	1.44-05	1.18-05
27	3.04-03	1.00-03	4.71-04	2.63-04	1.63-04	1.08-04	7.58-05	5.51-05	4.13-05	3.18-05	2.49-05	1.99-05	1.62-05	1.33-05
26	3.35-03	1.11-03	5.24-04	2.94-04	1.83-04	1.22-04	8.52-05	6.20-05	4.65-05	3.58-05	2.81-05	2.24-05	1.82-05	1.49-05
25	3.70-03	1.23-03	5.86-04	3.30-04	2.05-04	1.37-04	9.61-05	7.00-05	5.26-05	4.04-05	3.18-05	2.54-05	2.06-05	1.69-05
24	4.12-03	1.38-03	6.58-04	3.72-04	2.32-04	1.55-04	1.09-04	7.95-05	5.97-05	4.59-05	3.61-05	2.88-05	2.33-05	1.91-05
23	4.61-03	1.55-03	7.45-04	4.22-04	2.64-04	1.77-04	1.24-04	9.07-05	6.81-05	5.24-05	4.11-05	3.28-05	2.66-05	2.18-05
22	5.21-03	1.76-03	8.48-04	4.82-04	3.03-04	2.03-04	1.43-04	1.04-04	7.81-05	6.01-05	4.72-05	3.76-05	3.04-05	2.49-05
21	5.92-03	2.01-03	9.73-04	5.55-04	3.48-04	2.34-04	1.64-04	1.20-04	9.01-05	6.93-05	5.44-05	4.34-05	3.50-05	2.86-05
20	6.79-03	2.31-03	1.12-03	6.42-04	4.04-04	2.71-04	1.91-04	1.39-04	1.05-04	8.05-05	6.31-05	5.02-05	4.05-05	3.30-05
19	7.85-03	2.69-03	1.31-03	7.50-04	4.72-04	3.17-04	2.23-04	1.63-04	1.22-04	9.41-05	7.37-05	5.85-05	4.71-05	3.81-05
18	9.18-03	3.15-03	1.54-03	8.83-04	5.56-04	3.74-04	2.63-04	1.92-04	1.44-04	1.11-04	8.66-05	6.87-05	5.49-05	4.41-05
17	1.08-02	3.73-03	1.83-03	1.05-03	6.62-04	4.45-04	3.13-04	2.29-04	1.72-04	1.32-04	1.03-04	8.10-05	6.43-05	5.06-05
16	1.30-02	4.47-03	2.19-03	1.26-03	7.95-04	5.35-04	3.77-04	2.75-04	2.06-04	1.58-04	1.22-04	9.58-05	7.46-05	5.50-05
15	1.57-02	5.42-03	2.66-03	1.53-03	9.67-04	6.51-04	4.59-04	3.34-04	2.50-04	1.91-04	1.47-04	1.13-04	8.21-05	
14	1.93-02	6.67-03	3.28-03	1.89-03	1.19-03	8.04-04	5.66-04	4.12-04	3.07-04	2.32-04	1.75-04	1.26-04		
13	2.40-02	8.33-03	4.10-03	2.36-03	1.50-03	1.01-03	7.09-04	5.15-04	3.81-04	2.83-04	2.00-04			
12	3.06-02	1.06-02	5.23-03	3.02-03	1.91-03	1.29-03	9.04-04	6.52-04	4.74-04	3.29-04				
11	3.98-02	1.38-02	6.81-03	3.94-03	2.50-03	1.68-03	1.17-03	8.32-04	5.66-04					
10	5.31-02	1.84-02	9.12-03	5.29-03	3.35-03	2.24-03	1.54-03	1.03-03						
9	7.32-02	2.54-02	1.26-02	7.33-03	4.64-03	3.07-03	1.98-03							
8	1.05-01	3.65-02	1.82-02	1.06-02	6.63-03	4.14-03								
7	1.59-01	5.54-02	2.77-02	1.60-02	9.54-03									
6	2.59-01	9.03-02	4.52-02	2.51-02										
5	4.69-01	1.63-01	7.92-02											
4	1.00+00	3.36-01												
3	2.86+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.62-06	1.36-06	1.14-06	9.75-07	8.37-07	7.25-07	6.31-07	5.53-07	4.87-07	4.32-07	3.84-07	3.43-07	3.08-07	2.77-07
45	2.20-06	1.84-06	1.56-06	1.33-06	1.14-06	9.87-07	8.60-07	7.54-07	6.65-07	5.89-07	5.24-07	4.68-07	4.20-07	3.78-07
40	3.15-06	2.64-06	2.24-06	1.91-06	1.64-06	1.42-06	1.24-06	1.09-06	9.59-07	8.50-07	7.56-07	6.76-07	6.06-07	5.45-07
35	4.82-06	4.04-06	3.43-06	2.93-06	2.52-06	2.18-06	1.91-06	1.67-06	1.47-06	1.30-06	1.16-06	1.03-06	9.22-07	8.25-07
30	7.90-06	6.64-06	5.62-06	4.80-06	4.13-06	3.57-06	3.11-06	2.71-06	2.38-06	2.09-06	1.83-06	1.60-06	1.38-06	1.12-06
29	8.80-06	7.39-06	6.26-06	5.34-06	4.59-06	3.97-06	3.44-06	3.00-06	2.62-06	2.29-06	2.00-06	1.72-06	1.39-06	
28	9.84-06	8.26-06	6.99-06	5.96-06	5.11-06	4.41-06	3.82-06	3.32-06	2.89-06	2.51-06	2.14-06	1.73-06		
27	1.10-05	9.25-06	7.82-06	6.66-06	5.71-06	4.92-06	4.25-06	3.68-06	3.17-06	2.70-06	2.16-06			
26	1.24-05	1.04-05	8.78-06	7.47-06	6.39-06	5.48-06	4.72-06	4.04-06	3.42-06	2.73-06				
25	1.40-05	1.17-05	9.88-06	8.39-06	7.15-06	6.11-06	5.21-06	4.39-06	3.48-06					
24	1.59-05	1.33-05	1.12-05	9.44-06	8.01-06	6.78-06	5.68-06	4.48-06						
23	1.80-05	1.50-05	1.26-05	1.06-05	8.94-06	7.43-06	5.83-06							
22	2.06-05	1.71-05	1.43-05	1.19-05	9.84-06	7.67-06								
21	2.35-05	1.95-05	1.61-05	1.32-05	1.02-05									
20	2.70-05	2.22-05	1.80-05	1.38-05										
19	3.10-05	2.49-05	1.90-05											
18	3.52-05	2.65-05												
17	3.78-05													

H TE = 1.00+04 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.26-37	6.63-38	-5.85-38	-2.80-37	-5.74-37	-8.44-37	-8.98-37	-4.13-37	1.10-36	4.34-36	1.03-35	2.02-35	3.59-35
45	0.00+00	1.81-37	1.23-37	1.15-38	-1.73-37	-3.63-37	-3.81-37	1.01-37	1.62-36	4.97-36	1.13-35	2.23-35	4.02-35	6.80-35
40	0.00+00	2.72-37	2.31-37	1.68-37	8.81-38	1.18-37	5.47-37	1.88-36	4.94-36	1.10-35	2.18-35	4.00-35	6.93-35	1.15-34
35	0.00+00	4.31-37	4.44-37	5.20-37	7.04-37	1.21-36	2.48-36	5.24-36	1.07-35	2.06-35	3.77-35	6.60-35	1.11-34	1.82-34
30	0.00+00	7.17-37	8.49-37	1.22-36	1.95-36	3.35-36	6.01-36	1.09-35	1.96-35	3.45-35	5.93-35	9.98-35	1.65-34	2.69-34
29	0.00+00	7.99-37	9.65-37	1.43-36	2.30-36	3.94-36	6.96-36	1.24-35	2.18-35	3.77-35	6.41-35	1.07-34	1.76-34	2.87-34
28	0.00+00	8.91-37	1.10-36	1.66-36	2.70-36	4.61-36	8.01-36	1.40-35	2.41-35	4.11-35	6.91-35	1.14-34	1.88-34	3.05-34
27	0.00+00	9.98-37	1.25-36	1.92-36	3.15-36	5.35-36	9.17-36	1.57-35	2.67-35	4.47-35	7.42-35	1.22-34	1.99-34	3.24-34
26	0.00+00	1.12-36	1.42-36	2.21-36	3.66-36	6.19-36	1.05-35	1.76-35	2.94-35	4.86-35	7.96-35	1.30-34	2.11-34	3.42-34
25	0.00+00	1.26-36	1.61-36	2.55-36	4.25-36	7.14-36	1.20-35	1.98-35	3.26-35	5.30-35	8.56-35	1.38-34	2.22-34	3.60-34
24	0.00+00	1.43-36	1.84-36	2.94-36	4.92-36	8.25-36	1.37-35	2.24-35	3.62-35	5.80-35	9.23-35	1.47-34	2.34-34	3.76-34
23	0.00+00	1.62-36	2.11-36	3.40-36	5.71-36	9.56-36	1.57-35	2.55-35	4.06-35	6.40-35	1.00-34	1.57-34	2.45-34	3.88-34
22	0.00+00	1.85-36	2.42-36	3.94-36	6.65-36	1.11-35	1.82-35	2.93-35	4.61-35	7.15-35	1.10-34	1.68-34	2.55-34	3.86-34
21	0.00+00	2.13-36	2.81-36	4.60-36	7.81-36	1.31-35	2.14-35	3.41-35	5.32-35	8.13-35	1.22-34	1.80-34	2.56-34	3.48-34
20	0.00+00	2.48-36	3.28-36	5.41-36	9.25-36	1.56-35	2.55-35	4.06-35	6.29-35	9.48-35	1.38-34	1.92-34	2.39-34	2.00-34
19	0.00+00	2.90-36	3.86-36	6.44-36	1.11-35	1.89-35	3.11-35	4.96-35	7.65-35	1.14-34	1.59-34	1.96-34	1.49-34	-3.13-34
18	0.00+00	3.43-36	4.60-36	7.75-36	1.35-35	2.33-35	3.87-35	6.22-35	9.62-35	1.41-34	1.84-34	1.66-34	-1.93-34	-2.33-33
17	0.00+00	4.10-36	5.54-36	9.47-36	1.68-35	2.93-35	4.96-35	8.09-35	1.26-34	1.80-34	2.04-34	-9.75-36	-1.62-33	-1.33-32
16	0.00+00	4.97-36	6.79-36	1.18-35	2.13-35	3.81-35	6.59-35	1.10-34	1.72-34	2.36-34	1.68-34	-8.76-34	-9.77-33	-1.49-31
15	0.00+00	6.11-36	8.45-36	1.50-35	2.78-35	5.10-35	9.11-35	1.56-34	2.48-34	3.01-34	-2.29-34	-6.41-33	-1.17-31	
14	0.00+00	7.64-36	1.07-35	1.95-35	3.74-35	7.13-35	1.33-34	2.37-34	3.75-34	2.60-34	-3.50-33	-8.64-32		
13	0.00+00	9.75-36	1.40-35	2.63-35	5.24-35	1.05-34	2.07-34	3.88-34	5.67-34	-1.21-33	-5.87-32			
12	0.00+00	1.27-35	1.88-35	3.67-35	7.74-35	1.66-34	3.54-34	7.01-34	3.99-34	-3.51-32				
11	0.00+00	1.72-35	2.62-35	5.40-35	1.23-34	2.90-34	6.95-34	1.33-33	-1.63-32					
10	0.00+00	2.40-35	3.83-35	8.53-35	2.16-34	5.94-34	1.68-33	-3.05-33						
9	0.00+00	3.51-35	5.99-35	1.49-34	4.50-34	1.60-33	4.74-33							
8	0.00+00	5.49-35	1.03-34	3.08-34	1.26-33	7.74-33								
7	0.00+00	9.43-35	2.08-34	8.66-34	7.30-33									
6	0.00+00	1.88-34	5.62-34	5.20-33										
5	0.00+00	4.93-34	3.13-33											
4	0.00+00	2.49-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.97-35	9.45-35	1.44-34	2.14-34	3.09-34	4.38-34	6.12-34	8.42-34	1.15-33	1.54-33	2.05-33	2.72-33	3.56-33	4.64-33
45	1.10-34	1.72-34	2.61-34	3.87-34	5.63-34	8.09-34	1.15-33	1.61-33	2.24-33	3.10-33	4.27-33	5.86-33	8.03-33	1.10-32
40	1.84-34	2.87-34	4.39-34	6.58-34	9.75-34	1.43-33	2.08-33	3.01-33	4.35-33	6.29-33	9.11-33	1.32-32	1.94-32	2.88-32
35	2.92-34	4.58-34	7.10-34	1.09-33	1.66-33	2.53-33	3.84-33	5.88-33	9.07-33	1.42-32	2.26-32	3.70-32	6.29-32	1.13-31
30	4.33-34	6.94-34	1.11-33	1.78-33	2.87-33	4.70-33	7.88-33	1.36-32	2.47-32	4.80-32	1.03-31	2.65-31	9.36-31	7.29-30
29	4.64-34	7.48-34	1.21-33	1.96-33	3.23-33	5.43-33	9.40-33	1.70-32	3.30-32	7.09-32	1.81-31	6.34-31	4.90-30	
28	4.95-34	8.04-34	1.31-33	2.17-33	3.65-33	6.33-33	1.15-32	2.21-32	4.72-32	1.19-31	4.13-31	3.16-30		
27	5.27-34	8.62-34	1.43-33	2.40-33	4.16-33	7.49-33	1.44-32	3.04-32	7.55-32	2.57-31	1.93-30			
26	5.58-34	9.21-34	1.55-33	2.66-33	4.76-33	9.02-33	1.88-32	4.56-32	1.51-31	1.10-30				
25	5.88-34	9.77-34	1.66-33	2.92-33	5.43-33	1.10-32	2.56-32	7.98-32	5.45-31					
24	6.12-34	1.02-33	1.74-33	3.11-33	5.94-33	1.28-32	3.46-32	1.93-31						
23	6.19-34	1.01-33	1.67-33	2.83-33	4.83-33	7.02-33	-2.09-32							
22	5.78-34	8.33-34	1.03-33	2.72-34	-6.80-33	-1.44-31								
21	3.93-34	1.06-34	-2.02-33	-1.66-32	-2.05-31									
20	-2.67-34	-2.87-33	-1.93-32	-2.27-31										
19	-2.84-33	-1.88-32	-2.24-31											
18	-1.65-32	-2.06-31												
17	-1.79-31													

H TE = 1.00+04 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 2.592-13 4-2 RC = 3.034-14 4-2 EM = 1.240-25 2S RC = 8.422-14 2P RC = 1.750-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.39-04	2.58-04	1.11-04	5.75-05	3.36-05	2.13-05	1.43-05	1.01-05	7.39-06	5.57-06	4.30-06	3.39-06	2.72-06	2.21-06
45	1.08-03	3.31-04	1.43-04	7.40-05	4.32-05	2.74-05	1.85-05	1.30-05	9.54-06	7.19-06	5.56-06	4.38-06	3.51-06	2.86-06
40	1.43-03	4.40-04	1.90-04	9.87-05	5.78-05	3.67-05	2.48-05	1.75-05	1.28-05	9.66-06	7.47-06	5.89-06	4.73-06	3.85-06
35	1.99-03	6.16-04	2.67-04	1.39-04	8.19-05	5.22-05	3.53-05	2.50-05	1.83-05	1.38-05	1.07-05	8.47-06	6.80-06	5.55-06
30	2.90-03	9.08-04	3.98-04	2.10-04	1.24-04	7.99-05	5.43-05	3.87-05	2.85-05	2.16-05	1.68-05	1.33-05	1.07-05	8.75-06
29	3.15-03	9.87-04	4.35-04	2.30-04	1.37-04	8.78-05	5.99-05	4.27-05	3.15-05	2.39-05	1.86-05	1.47-05	1.19-05	9.71-06
28	3.41-03	1.08-03	4.75-04	2.52-04	1.50-04	9.70-05	6.63-05	4.73-05	3.50-05	2.66-05	2.07-05	1.64-05	1.32-05	1.08-05
27	3.71-03	1.17-03	5.22-04	2.78-04	1.66-04	1.08-04	7.37-05	5.27-05	3.90-05	2.97-05	2.31-05	1.84-05	1.48-05	1.21-05
26	4.05-03	1.29-03	5.75-04	3.08-04	1.85-04	1.20-04	8.24-05	5.90-05	4.38-05	3.34-05	2.60-05	2.07-05	1.67-05	1.37-05
25	4.43-03	1.42-03	6.36-04	3.43-04	2.07-04	1.34-04	9.26-05	6.65-05	4.94-05	3.77-05	2.94-05	2.34-05	1.89-05	1.55-05
24	4.87-03	1.56-03	7.07-04	3.83-04	2.32-04	1.52-04	1.05-04	7.53-05	5.60-05	4.28-05	3.34-05	2.66-05	2.15-05	1.76-05
23	5.37-03	1.74-03	7.91-04	4.31-04	2.62-04	1.72-04	1.19-04	8.59-05	6.40-05	4.90-05	3.83-05	3.05-05	2.46-05	2.01-05
22	5.97-03	1.94-03	8.91-04	4.89-04	2.99-04	1.97-04	1.36-04	9.86-05	7.36-05	5.63-05	4.41-05	3.51-05	2.83-05	2.32-05
21	6.68-03	2.18-03	1.01-03	5.58-04	3.43-04	2.26-04	1.58-04	1.14-04	8.52-05	6.53-05	5.10-05	4.06-05	3.28-05	2.68-05
20	7.54-03	2.47-03	1.16-03	6.43-04	3.97-04	2.63-04	1.83-04	1.33-04	9.94-05	7.61-05	5.95-05	4.73-05	3.81-05	3.10-05
19	8.58-03	2.83-03	1.33-03	7.47-04	4.63-04	3.08-04	2.15-04	1.56-04	1.17-04	8.94-05	6.99-05	5.54-05	4.45-05	3.61-05
18	9.87-03	3.28-03	1.56-03	8.77-04	5.46-04	3.64-04	2.54-04	1.85-04	1.38-04	1.06-04	8.25-05	6.53-05	5.22-05	4.20-05
17	1.15-02	3.84-03	1.84-03	1.04-03	6.50-04	4.34-04	3.04-04	2.21-04	1.65-04	1.26-04	9.81-05	7.73-05	6.13-05	4.83-05
16	1.35-02	4.56-03	2.20-03	1.25-03	7.82-04	5.23-04	3.66-04	2.66-04	1.99-04	1.52-04	1.17-04	9.17-05	7.13-05	5.28-05
15	1.62-02	5.49-03	2.66-03	1.52-03	9.53-04	6.38-04	4.47-04	3.24-04	2.42-04	1.84-04	1.41-04	1.08-04	7.88-05	
14	1.97-02	6.72-03	3.27-03	1.87-03	1.18-03	7.88-04	5.52-04	4.00-04	2.97-04	2.24-04	1.68-04	1.21-04		
13	2.44-02	8.37-03	4.09-03	2.35-03	1.48-03	9.89-04	6.92-04	5.00-04	3.68-04	2.72-04	1.92-04			
12	3.09-02	1.06-02	5.21-03	2.99-03	1.89-03	1.26-03	8.82-04	6.32-04	4.57-04	3.17-04				
11	4.00-02	1.38-02	6.79-03	3.91-03	2.46-03	1.65-03	1.14-03	8.04-04	5.45-04					
10	5.33-02	1.84-02	9.09-03	5.24-03	3.30-03	2.20-03	1.50-03	9.90-04						
9	7.34-02	2.54-02	1.26-02	7.25-03	4.56-03	2.99-03	1.91-03							
8	1.05-01	3.65-02	1.81-02	1.04-02	6.49-03	4.01-03								
7	1.59-01	5.53-02	2.75-02	1.58-02	9.27-03									
6	2.60-01	9.01-02	4.47-02	2.45-02										
5	4.69-01	1.62-01	7.77-02											
4	1.00+00	3.32-01												
3	2.85+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.83-06	1.52-06	1.29-06	1.09-06	9.38-07	8.11-07	7.06-07	6.18-07	5.44-07	4.81-07	4.28-07	3.82-07	3.43-07	3.08-07
45	2.36-06	1.97-06	1.66-06	1.41-06	1.21-06	1.05-06	9.13-07	7.99-07	7.04-07	6.23-07	5.53-07	4.94-07	4.43-07	3.98-07
40	3.18-06	2.65-06	2.24-06	1.91-06	1.64-06	1.41-06	1.23-06	1.08-06	9.48-07	8.38-07	7.45-07	6.64-07	5.95-07	5.35-07
35	4.58-06	3.83-06	3.23-06	2.75-06	2.36-06	2.04-06	1.78-06	1.55-06	1.37-06	1.21-06	1.07-06	9.54-07	8.52-07	7.63-07
30	7.24-06	6.06-06	5.11-06	4.36-06	3.74-06	3.23-06	2.81-06	2.45-06	2.15-06	1.89-06	1.66-06	1.46-06	1.26-06	1.03-06
29	8.03-06	6.72-06	5.68-06	4.84-06	4.15-06	3.58-06	3.11-06	2.71-06	2.37-06	2.08-06	1.82-06	1.56-06	1.27-06	
28	8.96-06	7.50-06	6.33-06	5.40-06	4.63-06	3.99-06	3.46-06	3.01-06	2.63-06	2.28-06	1.96-06	1.59-06		
27	1.00-05	8.40-06	7.10-06	6.04-06	5.18-06	4.46-06	3.86-06	3.35-06	2.90-06	2.47-06	2.00-06			
26	1.13-05	9.47-06	7.99-06	6.80-06	5.82-06	5.01-06	4.31-06	3.71-06	3.16-06	2.53-06				
25	1.28-05	1.07-05	9.04-06	7.68-06	6.56-06	5.62-06	4.81-06	4.06-06	3.25-06					
24	1.46-05	1.22-05	1.03-05	8.70-06	7.40-06	6.29-06	5.29-06	4.20-06						
23	1.67-05	1.39-05	1.17-05	9.87-06	8.33-06	6.95-06	5.49-06							
22	1.91-05	1.59-05	1.33-05	1.12-05	9.25-06	7.25-06								
21	2.20-05	1.83-05	1.52-05	1.25-05	9.71-06									
20	2.55-05	2.09-05	1.71-05	1.32-05										
19	2.94-05	2.37-05	1.81-05											
18	3.35-05	2.54-05												
17	3.62-05													

H TE = 1.00+04 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.06-37	-2.08-38	-3.29-37	-9.62-37	-2.07-36	-3.82-36	-6.40-36	-1.00-35	-1.50-35	-2.16-35	-3.03-35	-4.19-35	-5.75-35
45	0.00+00	1.58-37	1.99-38	-3.04-37	-9.52-37	-2.04-36	-3.66-36	-5.87-36	-8.69-36	-1.21-35	-1.61-35	-2.06-35	-2.57-35	-3.16-35
40	0.00+00	2.41-37	9.75-38	-2.24-37	-8.37-37	-1.78-36	-2.98-36	-4.23-36	-5.13-36	-5.03-36	-2.98-36	2.34-36	1.27-35	3.03-35
35	0.00+00	3.84-37	2.39-37	-6.13-38	-5.92-37	-1.26-36	-1.72-36	-1.31-36	1.15-36	7.52-36	2.06-35	4.47-35	8.58-35	1.53-34
30	0.00+00	6.53-37	5.45-37	3.66-37	1.15-37	1.20-37	1.17-36	4.78-36	1.36-35	3.19-35	6.66-35	1.29-34	2.36-34	4.15-34
29	0.00+00	7.35-37	6.48-37	5.25-37	3.95-37	6.51-37	2.22-36	6.86-36	1.76-35	3.96-35	8.11-35	1.56-34	2.84-34	5.02-34
28	0.00+00	8.30-37	7.71-37	7.25-37	7.50-37	1.32-36	3.51-36	9.37-36	2.24-35	4.88-35	9.82-35	1.87-34	3.42-34	6.08-34
27	0.00+00	9.41-37	9.21-37	9.74-37	1.20-36	2.16-36	5.10-36	1.24-35	2.82-35	5.95-35	1.18-34	2.25-34	4.12-34	7.37-34
26	0.00+00	1.07-36	1.10-36	1.28-36	1.75-36	3.19-36	7.03-36	1.60-35	3.49-35	7.21-35	1.42-34	2.69-34	4.95-34	8.95-34
25	0.00+00	1.23-36	1.32-36	1.66-36	2.44-36	4.45-36	9.35-36	2.03-35	4.28-35	8.68-35	1.69-34	3.21-34	5.95-34	1.09-33
24	0.00+00	1.41-36	1.58-36	2.11-36	3.27-36	5.98-36	1.21-35	2.53-35	5.20-35	1.04-34	2.02-34	3.82-34	7.15-34	1.33-33
23	0.00+00	1.62-36	1.88-36	2.66-36	4.29-36	7.81-36	1.54-35	3.12-35	6.27-35	1.24-34	2.39-34	4.55-34	8.63-34	1.64-33
22	0.00+00	1.88-36	2.25-36	3.33-36	5.51-36	1.00-35	1.93-35	3.81-35	7.50-35	1.46-34	2.82-34	5.42-34	1.04-33	2.04-33
21	0.00+00	2.18-36	2.70-36	4.13-36	6.98-36	1.26-35	2.39-35	4.61-35	8.93-35	1.73-34	3.33-34	6.46-34	1.27-33	2.58-33
20	0.00+00	2.54-36	3.23-36	5.09-36	8.75-36	1.58-35	2.94-35	5.57-35	1.06-34	2.03-34	3.94-34	7.74-34	1.57-33	3.34-33
19	0.00+00	2.99-36	3.87-36	6.26-36	1.09-35	1.96-35	3.61-35	6.71-35	1.26-34	2.40-34	4.66-34	9.34-34	1.96-33	4.45-33
18	0.00+00	3.53-36	4.66-36	7.70-36	1.36-35	2.44-35	4.44-35	8.13-35	1.51-34	2.86-34	5.57-34	1.14-33	2.49-33	6.13-33
17	0.00+00	4.22-36	5.65-36	9.51-36	1.69-35	3.05-35	5.52-35	1.00-34	1.84-34	3.45-34	6.71-34	1.38-33	3.07-33	7.78-33
16	0.00+00	5.09-36	6.92-36	1.18-35	2.14-35	3.88-35	7.01-35	1.27-34	2.30-34	4.25-34	8.00-34	1.51-33	2.16-33	-2.00-32
15	0.00+00	6.23-36	8.58-36	1.50-35	2.75-35	5.06-35	9.23-35	1.67-34	3.00-34	5.27-34	8.14-34	-1.56-34	-3.60-32	
14	0.00+00	7.76-36	1.09-35	1.94-35	3.65-35	6.87-35	1.28-34	2.33-34	4.09-34	5.87-34	-6.35-34	-3.75-32		
13	0.00+00	9.86-36	1.41-35	2.58-35	5.03-35	9.83-35	1.90-34	3.53-34	5.65-34	-2.43-34	-3.12-32			
12	0.00+00	1.28-35	1.88-35	3.58-35	7.32-35	1.51-34	3.10-34	5.87-34	4.13-34	-2.18-32				
11	0.00+00	1.73-35	2.60-35	5.23-35	1.15-34	2.58-34	5.78-34	9.89-34	-1.18-32					
10	0.00+00	2.40-35	3.79-35	8.21-35	1.99-34	5.14-34	1.31-33	-3.27-33						
9	0.00+00	3.52-35	5.92-35	1.43-34	4.08-34	1.33-33	2.78-33							
8	0.00+00	5.50-35	1.02-34	2.92-34	1.12-33	5.82-33								
7	0.00+00	9.45-35	2.05-34	8.11-34	6.14-33									
6	0.00+00	1.88-34	5.49-34	4.72-33										
5	0.00+00	4.93-34	3.01-33											
4	0.00+00	2.48-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-7.86-35	-1.08-34	-1.49-34	-2.07-34	-2.90-34	-4.09-34	-5.82-34	-8.31-34	-1.19-33	-1.70-33	-2.42-33	-3.44-33	-4.87-33	-6.87-33
45	-3.90-35	-4.93-35	-6.49-35	-9.04-35	-1.33-34	-2.05-34	-3.26-34	-5.23-34	-8.41-34	-1.34-33	-2.13-33	-3.35-33	-5.21-33	-8.06-33
40	5.78-35	9.82-35	1.55-34	2.30-34	3.25-34	4.38-34	5.62-34	6.79-34	7.54-34	7.19-34	4.55-34	-2.53-34	-1.79-33	-4.89-33
35	2.57-34	4.17-34	6.55-34	1.01-33	1.51-33	2.25-33	3.30-33	4.79-33	6.93-33	1.00-32	1.45-32	2.11-32	3.09-32	4.59-32
30	7.10-34	1.19-33	1.97-33	3.24-33	5.34-33	8.86-33	1.49-32	2.59-32	4.67-32	8.98-32	1.91-31	4.79-31	1.65-30	1.23-29
29	8.66-34	1.47-33	2.47-33	4.16-33	7.05-33	1.21-32	2.14-32	3.91-32	7.71-32	1.67-31	4.27-31	1.50-30	1.15-29	
28	1.06-33	1.82-33	3.13-33	5.41-33	9.47-33	1.70-32	3.18-32	6.34-32	1.40-31	3.64-31	1.30-30	1.01-29		
27	1.30-33	2.28-33	4.01-33	7.15-33	1.31-32	2.48-32	5.02-32	1.12-31	2.96-31	1.07-30	8.44-30			
26	1.60-33	2.88-33	5.21-33	9.67-33	1.86-32	3.83-32	8.66-32	2.31-31	8.46-31	6.71-30				
25	1.99-33	3.67-33	6.91-33	1.35-32	2.80-32	6.41-32	1.73-31	6.37-31	5.08-30					
24	2.50-33	4.77-33	9.43-33	1.98-32	4.56-32	1.24-31	4.57-31	3.64-30						
23	3.17-33	6.35-33	1.34-32	3.11-32	8.47-32	3.13-31	2.48-30							
22	4.12-33	8.76-33	2.04-32	5.54-32	2.04-31	1.59-30								
21	5.51-33	1.28-32	3.46-32	1.25-31	9.55-31									
20	7.71-33	2.06-32	7.27-32	5.31-31										
19	1.16-32	3.91-32	2.65-31											
18	1.90-32	1.07-31												
17	2.17-32													

H TE = 1.00+04 NE = 1.00+05 CASE B NC = 61

TOTAL RC = 2.602-13 4-2 RC = 3.048-14 4-2 EM = 1.246-25 2S RC = 8.477-14 2P RC = 1.755-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.53-04	2.92-04	1.26-04	6.51-05	3.80-05	2.41-05	1.62-05	1.14-05	8.34-06	6.28-06	4.85-06	3.82-06	3.06-06	2.49-06
45	1.27-03	3.88-04	1.67-04	8.65-05	5.05-05	3.20-05	2.15-05	1.52-05	1.11-05	8.35-06	6.45-06	5.08-06	4.07-06	3.31-06
40	1.71-03	5.25-04	2.26-04	1.17-04	6.82-05	4.32-05	2.91-05	2.05-05	1.50-05	1.13-05	8.71-06	6.86-06	5.50-06	4.48-06
35	2.35-03	7.22-04	3.11-04	1.61-04	9.40-05	5.96-05	4.01-05	2.83-05	2.07-05	1.56-05	1.20-05	9.48-06	7.60-06	6.18-06
30	3.37-03	1.04-03	4.47-04	2.32-04	1.36-04	8.62-05	5.81-05	4.10-05	3.00-05	2.26-05	1.75-05	1.38-05	1.10-05	8.98-06
29	3.66-03	1.13-03	4.86-04	2.53-04	1.48-04	9.39-05	6.33-05	4.47-05	3.27-05	2.46-05	1.90-05	1.50-05	1.20-05	9.79-06
28	3.99-03	1.23-03	5.31-04	2.76-04	1.62-04	1.03-04	6.92-05	4.89-05	3.58-05	2.70-05	2.09-05	1.64-05	1.32-05	1.07-05
27	4.37-03	1.35-03	5.82-04	3.03-04	1.78-04	1.13-04	7.62-05	5.38-05	3.94-05	2.97-05	2.30-05	1.81-05	1.45-05	1.18-05
26	4.80-03	1.48-03	6.41-04	3.34-04	1.96-04	1.25-04	8.42-05	5.96-05	4.36-05	3.29-05	2.55-05	2.01-05	1.61-05	1.31-05
25	5.29-03	1.64-03	7.10-04	3.70-04	2.18-04	1.39-04	9.37-05	6.63-05	4.86-05	3.67-05	2.84-05	2.24-05	1.80-05	1.46-05
24	5.86-03	1.82-03	7.89-04	4.13-04	2.43-04	1.55-04	1.05-04	7.42-05	5.45-05	4.12-05	3.19-05	2.51-05	2.02-05	1.64-05
23	6.50-03	2.02-03	8.81-04	4.62-04	2.72-04	1.74-04	1.18-04	8.37-05	6.15-05	4.65-05	3.60-05	2.84-05	2.28-05	1.86-05
22	7.24-03	2.26-03	9.89-04	5.20-04	3.08-04	1.97-04	1.34-04	9.50-05	6.99-05	5.29-05	4.10-05	3.24-05	2.60-05	2.11-05
21	8.10-03	2.54-03	1.11-03	5.89-04	3.49-04	2.24-04	1.53-04	1.09-04	8.01-05	6.07-05	4.71-05	3.72-05	2.99-05	2.43-05
20	9.09-03	2.86-03	1.27-03	6.72-04	4.00-04	2.58-04	1.76-04	1.26-04	9.26-05	7.03-05	5.45-05	4.31-05	3.46-05	2.81-05
19	1.03-02	3.25-03	1.45-03	7.72-04	4.62-04	2.99-04	2.05-04	1.46-04	1.08-04	8.22-05	6.38-05	5.04-05	4.04-05	3.27-05
18	1.16-02	3.71-03	1.67-03	8.96-04	5.39-04	3.50-04	2.41-04	1.72-04	1.28-04	9.71-05	7.54-05	5.95-05	4.75-05	3.82-05
17	1.33-02	4.28-03	1.94-03	1.05-03	6.36-04	4.15-04	2.86-04	2.06-04	1.52-04	1.16-04	8.99-05	7.08-05	5.62-05	4.44-05
16	1.54-02	4.98-03	2.28-03	1.25-03	7.61-04	4.99-04	3.45-04	2.48-04	1.84-04	1.40-04	1.08-04	8.45-05	6.59-05	4.90-05
15	1.81-02	5.89-03	2.73-03	1.51-03	9.23-04	6.08-04	4.22-04	3.04-04	2.25-04	1.70-04	1.31-04	1.00-04	7.36-05	
14	2.16-02	7.07-03	3.31-03	1.84-03	1.14-03	7.53-04	5.23-04	3.76-04	2.78-04	2.09-04	1.58-04	1.14-04		
13	2.62-02	8.66-03	4.10-03	2.30-03	1.43-03	9.47-04	6.58-04	4.72-04	3.46-04	2.56-04	1.81-04			
12	3.25-02	1.09-02	5.20-03	2.94-03	1.83-03	1.21-03	8.41-04	5.99-04	4.32-04	2.99-04				
11	4.13-02	1.40-02	6.75-03	3.84-03	2.39-03	1.58-03	1.09-03	7.64-04	5.16-04					
10	5.44-02	1.85-02	9.02-03	5.14-03	3.21-03	2.11-03	1.43-03	9.39-04						
9	7.42-02	2.54-02	1.25-02	7.11-03	4.42-03	2.87-03	1.82-03							
8	1.06-01	3.65-02	1.79-02	1.02-02	6.27-03	3.83-03								
7	1.60-01	5.52-02	2.71-02	1.54-02	8.89-03									
6	2.60-01	8.96-02	4.39-02	2.36-02										
5	4.70-01	1.61-01	7.55-02											
4	1.00+00	3.26-01												
3	2.83+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.06-06	1.72-06	1.45-06	1.23-06	1.06-06	9.12-07	7.93-07	6.94-07	6.11-07	5.40-07	4.80-07	4.29-07	3.84-07	3.46-07
45	2.73-06	2.28-06	1.92-06	1.63-06	1.40-06	1.21-06	1.05-06	9.22-07	8.11-07	7.17-07	6.37-07	5.69-07	5.10-07	4.58-07
40	3.69-06	3.08-06	2.60-06	2.21-06	1.89-06	1.64-06	1.42-06	1.24-06	1.09-06	9.67-07	8.59-07	7.66-07	6.85-07	6.16-07
35	5.10-06	4.25-06	3.58-06	3.05-06	2.61-06	2.25-06	1.96-06	1.71-06	1.50-06	1.33-06	1.18-06	1.05-06	9.35-07	8.36-07
30	7.40-06	6.17-06	5.20-06	4.42-06	3.78-06	3.26-06	2.83-06	2.47-06	2.16-06	1.89-06	1.66-06	1.46-06	1.26-06	1.03-06
29	8.07-06	6.73-06	5.67-06	4.81-06	4.12-06	3.55-06	3.07-06	2.68-06	2.34-06	2.04-06	1.78-06	1.54-06	1.25-06	
28	8.84-06	7.37-06	6.21-06	5.27-06	4.51-06	3.88-06	3.36-06	2.92-06	2.54-06	2.20-06	1.89-06	1.53-06		
27	9.74-06	8.12-06	6.84-06	5.80-06	4.96-06	4.26-06	3.68-06	3.18-06	2.75-06	2.35-06	1.90-06			
26	1.08-05	9.00-06	7.57-06	6.42-06	5.48-06	4.70-06	4.05-06	3.48-06	2.95-06	2.37-06				
25	1.20-05	1.00-05	8.44-06	7.15-06	6.09-06	5.20-06	4.45-06	3.76-06	3.00-06					
24	1.35-05	1.13-05	9.46-06	8.00-06	6.79-06	5.76-06	4.84-06	3.85-06						
23	1.53-05	1.27-05	1.07-05	8.98-06	7.57-06	6.32-06	5.00-06							
22	1.74-05	1.45-05	1.21-05	1.01-05	8.38-06	6.59-06								
21	2.00-05	1.65-05	1.37-05	1.13-05	8.81-06									
20	2.30-05	1.89-05	1.54-05	1.20-05										
19	2.66-05	2.15-05	1.65-05											
18	3.06-05	2.33-05												
17	3.34-05													

H TE = 1.00+04 NE = 1.00+05 CASE B NC = 61

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	8.93-38	-9.99-38	-5.83-37	-1.62-36	-3.57-36	-6.89-36	-1.22-35	-2.05-35	-3.30-35	-5.15-35	-7.86-35	-1.18-34	-1.74-34
45	0.00+00	1.29-37	-1.11-37	-7.22-37	-2.04-36	-4.50-36	-8.69-36	-1.55-35	-2.60-35	-4.19-35	-6.57-35	-1.01-34	-1.53-34	-2.29-34
40	0.00+00	1.99-37	-9.63-38	-8.43-37	-2.45-36	-5.42-36	-1.05-35	-1.86-35	-3.11-35	-5.03-35	-7.93-35	-1.23-34	-1.89-34	-2.87-34
35	0.00+00	3.30-37	-9.68-39	-8.51-37	-2.63-36	-5.86-36	-1.12-35	-1.96-35	-3.23-35	-5.15-35	-8.07-35	-1.26-34	-1.95-34	-3.06-34
30	0.00+00	5.84-37	2.28-37	-6.13-37	-2.32-36	-5.20-36	-9.48-36	-1.53-35	-2.30-35	-3.29-35	-4.63-35	-6.64-35	-1.00-34	-1.61-34
29	0.00+00	6.59-37	3.03-37	-5.27-37	-2.19-36	-4.92-36	-8.78-36	-1.37-35	-1.93-35	-2.55-35	-3.24-35	-4.15-35	-5.73-35	-9.10-35
28	0.00+00	7.46-37	3.91-37	-4.25-37	-2.04-36	-4.59-36	-7.96-36	-1.17-35	-1.50-35	-1.66-35	-1.52-35	-9.97-36	-1.99-36	2.27-36
27	0.00+00	8.47-37	4.94-37	-3.02-37	-1.85-36	-4.19-36	-6.98-36	-9.37-36	-8.77-36	-5.73-36	6.19-36	3.01-35	7.02-35	1.28-34
26	0.00+00	9.66-37	6.18-37	-1.50-37	-1.61-36	-3.69-36	-5.78-36	-6.50-36	-3.33-36	7.84-36	3.33-35	8.20-35	1.66-34	3.01-34
25	0.00+00	1.11-36	7.70-37	4.43-38	-1.30-36	-3.04-36	-4.24-36	-2.88-36	4.80-36	2.51-35	6.85-35	1.51-34	2.97-34	5.46-34
24	0.00+00	1.28-36	9.59-37	3.00-37	-8.79-37	-2.16-36	-2.21-36	1.83-36	1.54-35	4.78-35	1.15-34	2.45-34	4.82-34	9.06-34
23	0.00+00	1.48-36	1.20-36	6.43-37	-2.88-37	-9.43-37	5.34-37	8.11-36	2.94-35	7.81-35	1.79-34	3.76-34	7.51-34	1.46-33
22	0.00+00	1.73-36	1.50-36	1.11-36	5.40-37	7.55-37	4.29-36	1.66-35	4.82-35	1.19-34	2.68-34	5.65-34	1.15-33	2.33-33
21	0.00+00	2.03-36	1.89-36	1.74-36	1.70-36	3.12-36	9.45-36	2.81-35	7.38-35	1.76-34	3.93-34	8.43-34	1.78-33	3.80-33
20	0.00+00	2.41-36	2.40-36	2.59-36	3.30-36	6.40-36	1.65-35	4.37-35	1.09-34	2.55-34	5.73-34	1.26-33	2.80-33	6.43-33
19	0.00+00	2.88-36	3.06-36	3.74-36	5.51-36	1.09-35	2.61-35	6.48-35	1.57-34	3.66-34	8.40-34	1.93-33	4.58-33	1.17-32
18	0.00+00	3.47-36	3.91-36	5.28-36	8.51-36	1.70-35	3.91-35	9.37-35	2.23-34	5.27-34	1.25-33	3.04-33	7.96-33	2.40-32
17	0.00+00	4.22-36	5.02-36	7.34-36	1.26-35	2.53-35	5.67-35	1.33-34	3.17-34	7.64-34	1.90-33	5.07-33	1.55-32	6.29-32
16	0.00+00	5.17-36	6.46-36	1.01-35	1.81-35	3.66-35	8.08-35	1.88-34	4.51-34	1.13-33	3.04-33	9.33-33	3.77-32	3.12-31
15	0.00+00	6.41-36	8.35-36	1.37-35	2.55-35	5.21-35	1.14-34	2.66-34	6.55-34	1.74-33	5.29-33	2.09-32	1.64-31	
14	0.00+00	8.02-36	1.09-35	1.87-35	3.58-35	7.39-35	1.63-34	3.83-34	9.83-34	2.87-33	1.08-32	7.52-32		
13	0.00+00	1.02-35	1.43-35	2.56-35	5.06-35	1.06-34	2.37-34	5.74-34	1.57-33	5.29-33	2.88-32			
12	0.00+00	1.32-35	1.91-35	3.58-35	7.34-35	1.59-34	3.66-34	9.25-34	2.69-33	7.94-33				
11	0.00+00	1.77-35	2.64-35	5.19-35	1.12-34	2.57-34	6.29-34	1.64-33	1.08-33					
10	0.00+00	2.45-35	3.81-35	8.01-35	1.88-34	4.79-34	1.29-33	7.27-34						
9	0.00+00	3.56-35	5.89-35	1.37-34	3.71-34	1.15-33	2.67-33							
8	0.00+00	5.54-35	1.00-34	2.75-34	9.75-34	4.47-33								
7	0.00+00	9.49-35	2.00-34	7.43-34	4.97-33									
6	0.00+00	1.89-34	5.31-34	4.16-33										
5	0.00+00	4.94-34	2.86-33											
4	0.00+00	2.47-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-2.54-34	-3.67-34	-5.24-34	-7.41-34	-1.04-33	-1.44-33	-1.97-33	-2.68-33	-3.62-33	-4.86-33	-6.47-33	-8.57-33	-1.13-32	-1.47-32
45	-3.39-34	-4.98-34	-7.25-34	-1.05-33	-1.50-33	-2.12-33	-2.99-33	-4.19-33	-5.83-33	-8.08-33	-1.11-32	-1.53-32	-2.10-32	-2.88-32
40	-4.35-34	-6.56-34	-9.83-34	-1.47-33	-2.17-33	-3.21-33	-4.71-33	-6.90-33	-1.01-32	-1.48-32	-2.17-32	-3.19-32	-4.72-32	-7.04-32
35	-4.80-34	-7.58-34	-1.20-33	-1.90-33	-3.01-33	-4.77-33	-7.57-33	-1.21-32	-1.95-32	-3.17-32	-5.26-32	-8.95-32	-1.57-31	-2.90-31
30	-2.77-34	-5.00-34	-9.27-34	-1.74-33	-3.29-33	-6.25-33	-1.20-32	-2.38-32	-4.90-32	-1.08-31	-2.64-31	-7.63-31	-3.05-30	-2.68-29
29	-1.67-34	-3.37-34	-7.01-34	-1.46-33	-3.02-33	-6.23-33	-1.30-32	-2.82-32	-6.45-32	-1.63-31	-4.88-31	-2.01-30	-1.82-29	
28	-1.58-35	-1.00-34	-3.49-34	-9.72-34	-2.43-33	-5.82-33	-1.38-32	-3.40-32	-9.11-32	-2.86-31	-1.23-30	-1.15-29		
27	1.96-34	2.47-34	2.03-34	-1.34-34	-1.26-33	-4.49-33	-1.37-32	-4.18-32	-1.44-31	-6.63-31	-6.60-30			
26	5.00-34	7.73-34	1.09-33	1.35-33	1.15-33	-9.07-34	-1.00-32	-5.00-32	-2.80-31	-3.17-30				
25	9.52-34	1.60-33	2.61-33	4.15-33	6.40-33	9.11-33	8.41-33	-3.51-32	-9.04-31					
24	1.65-33	2.97-33	5.35-33	9.87-33	1.92-32	4.15-32	1.10-31	4.87-31						
23	2.79-33	5.39-33	1.08-32	2.31-32	5.68-32	1.85-31	1.25-30							
22	4.74-33	1.00-32	2.28-32	5.97-32	2.10-31	1.58-30								
21	8.37-33	1.99-32	5.47-32	2.02-31	1.59-30									
20	1.59-32	4.53-32	1.73-31	1.41-30										
19	3.43-32	1.35-31	1.13-30											
18	9.62-32	8.13-31												
17	5.30-31													

H TE = 1.00+04 NE = 1.00+06 CASE B NC = 39

TOTAL RC = 2.621-13 4-2 RC = 3.070-14 4-2 EM = 1.255-25 2S RC = 8.571-14 2P RC = 1.764-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.86-04	3.03-04	1.30-04	6.74-05	3.93-05	2.49-05	1.68-05	1.18-05	8.63-06	6.50-06	5.02-06	3.95-06	3.17-06	2.58-06
45	1.34-03	4.13-04	1.77-04	9.18-05	5.36-05	3.39-05	2.28-05	1.61-05	1.18-05	8.85-06	6.83-06	5.38-06	4.31-06	3.51-06
40	1.89-03	5.80-04	2.49-04	1.29-04	7.52-05	4.76-05	3.21-05	2.26-05	1.65-05	1.24-05	9.59-06	7.55-06	6.05-06	4.92-06
35	2.73-03	8.38-04	3.60-04	1.86-04	1.09-04	6.89-05	4.63-05	3.26-05	2.39-05	1.80-05	1.39-05	1.09-05	8.74-06	7.11-06
30	4.07-03	1.25-03	5.36-04	2.78-04	1.62-04	1.03-04	6.90-05	4.86-05	3.55-05	2.67-05	2.06-05	1.62-05	1.30-05	1.06-05
29	4.42-03	1.36-03	5.82-04	3.02-04	1.76-04	1.11-04	7.50-05	5.28-05	3.86-05	2.91-05	2.24-05	1.76-05	1.41-05	1.15-05
28	4.80-03	1.47-03	6.33-04	3.28-04	1.91-04	1.21-04	8.16-05	5.75-05	4.20-05	3.16-05	2.44-05	1.92-05	1.54-05	1.25-05
27	5.23-03	1.60-03	6.90-04	3.57-04	2.09-04	1.32-04	8.89-05	6.26-05	4.57-05	3.44-05	2.65-05	2.09-05	1.67-05	1.36-05
26	5.70-03	1.75-03	7.53-04	3.90-04	2.28-04	1.44-04	9.70-05	6.83-05	4.99-05	3.76-05	2.90-05	2.28-05	1.82-05	1.48-05
25	6.23-03	1.91-03	8.23-04	4.27-04	2.49-04	1.58-04	1.06-04	7.48-05	5.47-05	4.11-05	3.17-05	2.49-05	2.00-05	1.62-05
24	6.84-03	2.10-03	9.04-04	4.69-04	2.74-04	1.73-04	1.17-04	8.22-05	6.01-05	4.52-05	3.48-05	2.74-05	2.19-05	1.78-05
23	7.55-03	2.32-03	9.98-04	5.18-04	3.02-04	1.92-04	1.29-04	9.08-05	6.64-05	4.99-05	3.85-05	3.03-05	2.42-05	1.96-05
22	8.37-03	2.57-03	1.11-03	5.75-04	3.36-04	2.13-04	1.43-04	1.01-04	7.38-05	5.55-05	4.28-05	3.36-05	2.69-05	2.18-05
21	9.35-03	2.88-03	1.24-03	6.44-04	3.76-04	2.39-04	1.61-04	1.13-04	8.28-05	6.23-05	4.80-05	3.77-05	3.01-05	2.44-05
20	1.05-02	3.24-03	1.40-03	7.27-04	4.25-04	2.70-04	1.82-04	1.28-04	9.38-05	7.05-05	5.43-05	4.27-05	3.40-05	2.75-05
19	1.20-02	3.69-03	1.59-03	8.29-04	4.86-04	3.08-04	2.08-04	1.47-04	1.07-04	8.07-05	6.21-05	4.87-05	3.88-05	3.13-05
18	1.37-02	4.23-03	1.83-03	9.54-04	5.60-04	3.56-04	2.40-04	1.70-04	1.24-04	9.33-05	7.18-05	5.63-05	4.47-05	3.57-05
17	1.58-02	4.88-03	2.12-03	1.11-03	6.52-04	4.16-04	2.81-04	1.98-04	1.45-04	1.09-04	8.39-05	6.56-05	5.17-05	4.07-05
16	1.83-02	5.69-03	2.48-03	1.30-03	7.69-04	4.91-04	3.32-04	2.35-04	1.72-04	1.29-04	9.93-05	7.71-05	5.99-05	4.45-05
15	2.14-02	6.70-03	2.94-03	1.55-03	9.18-04	5.89-04	3.99-04	2.83-04	2.07-04	1.56-04	1.19-04	9.07-05	6.65-05	
14	2.53-02	7.96-03	3.52-03	1.87-03	1.12-03	7.18-04	4.88-04	3.46-04	2.53-04	1.89-04	1.42-04	1.03-04		
13	3.03-02	9.61-03	4.29-03	2.30-03	1.38-03	8.92-04	6.09-04	4.32-04	3.15-04	2.32-04	1.64-04			
12	3.69-02	1.18-02	5.34-03	2.89-03	1.75-03	1.13-03	7.75-04	5.48-04	3.93-04	2.73-04				
11	4.60-02	1.48-02	6.81-03	3.73-03	2.27-03	1.48-03	1.01-03	7.02-04	4.75-04					
10	5.90-02	1.92-02	8.96-03	4.96-03	3.03-03	1.97-03	1.33-03	8.69-04						
9	7.86-02	2.59-02	1.23-02	6.85-03	4.19-03	2.69-03	1.70-03							
8	1.10-01	3.66-02	1.76-02	9.83-03	5.94-03	3.59-03								
7	1.63-01	5.50-02	2.65-02	1.47-02	8.38-03									
6	2.62-01	8.89-02	4.26-02	2.24-02										
5	4.71-01	1.58-01	7.25-02											
4	1.00+00	3.17-01												
3	2.81+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.13-06	1.77-06	1.50-06	1.27-06	1.09-06	9.43-07	8.20-07	7.18-07	6.31-07	5.59-07	4.96-07	4.43-07	3.97-07	3.57-07
45	2.89-06	2.41-06	2.03-06	1.73-06	1.48-06	1.28-06	1.11-06	9.75-07	8.58-07	7.59-07	6.74-07	6.02-07	5.39-07	4.85-07
40	4.06-06	3.39-06	2.85-06	2.43-06	2.08-06	1.80-06	1.56-06	1.36-06	1.20-06	1.06-06	9.42-07	8.39-07	7.51-07	6.75-07
35	5.86-06	4.89-06	4.11-06	3.50-06	3.00-06	2.59-06	2.25-06	1.96-06	1.72-06	1.52-06	1.35-06	1.20-06	1.07-06	9.56-07
30	8.71-06	7.25-06	6.10-06	5.18-06	4.43-06	3.82-06	3.31-06	2.88-06	2.52-06	2.21-06	1.94-06	1.70-06	1.47-06	1.20-06
29	9.45-06	7.87-06	6.62-06	5.62-06	4.81-06	4.14-06	3.58-06	3.12-06	2.72-06	2.38-06	2.07-06	1.78-06	1.45-06	
28	1.03-05	8.56-06	7.19-06	6.10-06	5.21-06	4.48-06	3.88-06	3.36-06	2.92-06	2.54-06	2.17-06	1.76-06		
27	1.12-05	9.31-06	7.82-06	6.63-06	5.66-06	4.86-06	4.19-06	3.62-06	3.13-06	2.67-06	2.15-06			
26	1.22-05	1.01-05	8.52-06	7.22-06	6.15-06	5.27-06	4.53-06	3.89-06	3.30-06	2.65-06				
25	1.33-05	1.11-05	9.30-06	7.86-06	6.69-06	5.71-06	4.87-06	4.11-06	3.28-06					
24	1.46-05	1.22-05	1.02-05	8.59-06	7.28-06	6.17-06	5.17-06	4.11-06						
23	1.61-05	1.34-05	1.12-05	9.40-06	7.91-06	6.59-06	5.20-06							
22	1.79-05	1.48-05	1.23-05	1.03-05	8.52-06	6.68-06								
21	2.00-05	1.65-05	1.36-05	1.12-05	8.71-06									
20	2.24-05	1.84-05	1.50-05	1.16-05										
19	2.53-05	2.04-05	1.56-05											
18	2.85-05	2.16-05												
17	3.06-05													

H TE = 1.00+04 NE = 1.00+06 CASE B NC = 39

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	8.46-38	-1.29-37	-6.85-37	-1.91-36	-4.28-36	-8.45-36	-1.54-35	-2.65-35	-4.37-35	-6.95-35	-1.08-34	-1.62-34	-2.38-34
45	0.00+00	1.18-37	-1.72-37	-9.31-37	-2.61-36	-5.87-36	-1.17-35	-2.14-35	-3.70-35	-6.16-35	-9.89-35	-1.55-34	-2.36-34	-3.51-34
40	0.00+00	1.72-37	-2.30-37	-1.29-36	-3.65-36	-8.25-36	-1.65-35	-3.05-35	-5.34-35	-8.98-35	-1.46-34	-2.32-34	-3.60-34	-5.47-34
35	0.00+00	2.72-37	-2.87-37	-1.77-36	-5.10-36	-1.16-35	-2.35-35	-4.40-35	-7.82-35	-1.34-34	-2.22-34	-3.61-34	-5.74-34	-8.99-34
30	0.00+00	4.78-37	-2.79-37	-2.29-36	-6.85-36	-1.59-35	-3.26-35	-6.21-35	-1.12-34	-1.97-34	-3.39-34	-5.72-34	-9.53-34	-1.57-33
29	0.00+00	5.43-37	-2.51-37	-2.36-36	-7.16-36	-1.67-35	-3.44-35	-6.57-35	-1.20-34	-2.11-34	-3.66-34	-6.25-34	-1.05-33	-1.76-33
28	0.00+00	6.22-37	-2.07-37	-2.41-36	-7.43-36	-1.74-35	-3.60-35	-6.89-35	-1.26-34	-2.25-34	-3.93-34	-6.79-34	-1.16-33	-1.98-33
27	0.00+00	7.15-37	-1.44-37	-2.42-36	-7.62-36	-1.80-35	-3.73-35	-7.17-35	-1.32-34	-2.37-34	-4.19-34	-7.35-34	-1.28-33	-2.22-33
26	0.00+00	8.28-37	-5.46-38	-2.39-36	-7.73-36	-1.84-35	-3.82-35	-7.38-35	-1.37-34	-2.48-34	-4.43-34	-7.89-34	-1.40-33	-2.50-33
25	0.00+00	9.63-37	6.45-38	-2.31-36	-7.73-36	-1.85-35	-3.86-35	-7.48-35	-1.39-34	-2.55-34	-4.63-34	-8.41-34	-1.53-33	-2.80-33
24	0.00+00	1.13-36	2.19-37	-2.17-36	-7.61-36	-1.84-35	-3.85-35	-7.47-35	-1.40-34	-2.58-34	-4.77-34	-8.86-34	-1.66-33	-3.14-33
23	0.00+00	1.32-36	4.15-37	-1.96-36	-7.36-36	-1.80-35	-3.77-35	-7.33-35	-1.38-34	-2.57-34	-4.83-34	-9.22-34	-1.79-33	-3.54-33
22	0.00+00	1.56-36	6.59-37	-1.68-36	-6.99-36	-1.74-35	-3.63-35	-7.04-35	-1.32-34	-2.50-34	-4.79-34	-9.45-34	-1.92-33	-4.01-33
21	0.00+00	1.85-36	9.62-37	-1.32-36	-6.48-36	-1.64-35	-3.42-35	-6.57-35	-1.23-34	-2.34-34	-4.60-34	-9.46-34	-2.04-33	-4.60-33
20	0.00+00	2.20-36	1.34-36	-8.53-37	-5.79-36	-1.51-35	-3.11-35	-5.87-35	-1.08-34	-2.06-34	-4.16-34	-9.05-34	-2.12-33	-5.32-33
19	0.00+00	2.64-36	1.83-36	-2.31-37	-4.83-36	-1.31-35	-2.66-35	-4.80-35	-8.40-35	-1.55-34	-3.20-34	-7.61-34	-2.04-33	-6.13-33
18	0.00+00	3.19-36	2.47-36	6.38-37	-3.41-36	-1.02-35	-1.95-35	-3.04-35	-4.20-35	-5.87-35	-1.13-34	-3.52-34	-1.39-33	-6.23-33
17	0.00+00	3.91-36	3.33-36	1.90-36	-1.18-36	-5.37-36	-7.74-36	-5.60-37	3.39-35	1.31-34	3.59-34	8.27-34	1.61-33	1.02-33
16	0.00+00	4.85-36	4.53-36	3.80-36	2.38-36	2.59-36	1.22-35	5.22-35	1.77-34	5.31-34	1.53-33	4.65-33	1.74-32	1.26-31
15	0.00+00	6.10-36	6.23-36	6.71-36	8.17-36	1.60-35	4.68-35	1.48-34	4.63-34	1.45-33	4.91-33	2.11-32	1.83-31	
14	0.00+00	7.80-36	8.69-36	1.12-35	1.76-35	3.86-35	1.08-34	3.32-34	1.08-33	3.89-33	1.79-32	1.68-31		
13	0.00+00	1.02-35	1.23-35	1.82-35	3.32-35	7.77-35	2.20-34	7.07-34	2.61-33	1.25-32	1.21-31			
12	0.00+00	1.35-35	1.76-35	2.93-35	5.92-35	1.47-34	4.41-34	1.58-33	7.52-33	7.23-32				
11	0.00+00	1.83-35	2.57-35	4.72-35	1.05-34	2.80-34	9.27-34	4.15-33	3.69-32					
10	0.00+00	2.55-35	3.84-35	7.78-35	1.90-34	5.69-34	2.28-33	1.70-32						
9	0.00+00	3.70-35	6.01-35	1.36-34	3.79-34	1.38-33	8.31-33							
8	0.00+00	5.72-35	1.02-34	2.68-34	9.48-34	5.29-33								
7	0.00+00	9.69-35	1.99-34	6.94-34	4.38-33									
6	0.00+00	1.91-34	5.15-34	3.62-33										
5	0.00+00	4.96-34	2.68-33											
4	0.00+00	2.47-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-3.43-34	-4.84-34	-6.70-34	-9.12-34	-1.22-33	-1.60-33	-2.07-33	-2.62-33	-3.27-33	-4.02-33	-4.88-33	-5.87-33	-7.00-33	-8.33-33
45	-5.13-34	-7.35-34	-1.03-33	-1.43-33	-1.96-33	-2.63-33	-3.47-33	-4.52-33	-5.80-33	-7.35-33	-9.24-33	-1.15-32	-1.43-32	-1.78-32
40	-8.15-34	-1.20-33	-1.73-33	-2.46-33	-3.47-33	-4.82-33	-6.61-33	-8.96-33	-1.20-32	-1.60-32	-2.13-32	-2.83-32	-3.79-32	-5.12-32
35	-1.39-33	-2.11-33	-3.18-33	-4.75-33	-7.04-33	-1.04-32	-1.52-32	-2.21-32	-3.23-32	-4.74-32	-7.05-32	-1.07-31	-1.68-31	-2.78-31
30	-2.57-33	-4.18-33	-6.79-33	-1.11-32	-1.81-32	-3.00-32	-5.05-32	-8.72-32	-1.57-31	-2.99-31	-6.33-31	-1.59-30	-5.49-30	-4.18-29
29	-2.93-33	-4.87-33	-8.10-33	-1.36-32	-2.30-32	-3.95-32	-6.99-32	-1.29-31	-2.51-31	-5.42-31	-1.38-30	-4.86-30	-3.75-29	
28	-3.36-33	-5.71-33	-9.76-33	-1.69-32	-2.98-32	-5.39-32	-1.02-31	-2.03-31	-4.49-31	-1.17-30	-4.19-30	-3.28-29		
27	-3.86-33	-6.75-33	-1.19-32	-2.15-32	-3.98-32	-7.69-32	-1.58-31	-3.57-31	-9.54-31	-3.49-30	-2.79-29			
26	-4.46-33	-8.05-33	-1.48-32	-2.81-32	-5.56-32	-1.17-31	-2.72-31	-7.45-31	-2.79-30	-2.28-29				
25	-5.18-33	-9.74-33	-1.89-32	-3.82-32	-8.25-32	-1.97-31	-5.54-31	-2.13-30	-1.79-29					
24	-6.06-33	-1.20-32	-2.49-32	-5.50-32	-1.35-31	-3.89-31	-1.54-30	-1.33-29						
23	-7.20-33	-1.53-32	-3.46-32	-8.68-32	-2.58-31	-1.05-30	-9.36-30							
22	-8.76-33	-2.04-32	-5.24-32	-1.60-31	-6.70-31	-6.16-30								
21	-1.11-32	-2.94-32	-9.22-32	-3.98-31	-3.77-30									
20	-1.48-32	-4.84-32	-2.17-31	-2.12-30										
19	-2.16-32	-1.03-31	-1.06-30											
18	-3.56-32	-4.18-31												
17	-5.37-32													

H TE = 1.00+04 NE = 1.00+07 CASE B NC = 24

TOTAL RC = 2.657-13 4-2 RC = 3.112-14 4-2 EM = 1.272-25 2S RC = 8.729-14 2P RC = 1.784-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.82-04	3.01-04	1.29-04	6.71-05	3.91-05	2.48-05	1.67-05	1.18-05	8.59-06	6.47-06	4.99-06	3.93-06	3.15-06	2.57-06
45	1.35-03	4.13-04	1.78-04	9.20-05	5.36-05	3.40-05	2.29-05	1.61-05	1.18-05	8.87-06	6.84-06	5.39-06	4.32-06	3.52-06
40	1.91-03	5.87-04	2.52-04	1.31-04	7.62-05	4.83-05	3.25-05	2.29-05	1.67-05	1.26-05	9.72-06	7.65-06	6.13-06	4.99-06
35	2.85-03	8.73-04	3.75-04	1.94-04	1.13-04	7.17-05	4.82-05	3.40-05	2.48-05	1.87-05	1.44-05	1.14-05	9.09-06	7.40-06
30	4.46-03	1.37-03	5.87-04	3.04-04	1.77-04	1.12-04	7.55-05	5.32-05	3.88-05	2.92-05	2.25-05	1.77-05	1.42-05	1.15-05
29	4.91-03	1.51-03	6.47-04	3.35-04	1.95-04	1.24-04	8.31-05	5.85-05	4.28-05	3.22-05	2.48-05	1.95-05	1.56-05	1.27-05
28	5.42-03	1.66-03	7.14-04	3.70-04	2.16-04	1.36-04	9.18-05	6.46-05	4.72-05	3.55-05	2.74-05	2.15-05	1.72-05	1.40-05
27	6.00-03	1.84-03	7.91-04	4.09-04	2.39-04	1.51-04	1.01-04	7.15-05	5.22-05	3.92-05	3.02-05	2.38-05	1.90-05	1.55-05
26	6.66-03	2.04-03	8.77-04	4.54-04	2.64-04	1.67-04	1.13-04	7.92-05	5.78-05	4.35-05	3.35-05	2.63-05	2.11-05	1.71-05
25	7.40-03	2.27-03	9.74-04	5.04-04	2.94-04	1.86-04	1.25-04	8.80-05	6.42-05	4.83-05	3.72-05	2.92-05	2.34-05	1.90-05
24	8.20-03	2.51-03	1.08-03	5.59-04	3.26-04	2.06-04	1.39-04	9.76-05	7.12-05	5.35-05	4.12-05	3.24-05	2.59-05	2.10-05
23	9.14-03	2.80-03	1.20-03	6.23-04	3.63-04	2.30-04	1.54-04	1.09-04	7.93-05	5.96-05	4.59-05	3.61-05	2.88-05	2.34-05
22	1.02-02	3.13-03	1.34-03	6.95-04	4.05-04	2.56-04	1.72-04	1.21-04	8.84-05	6.64-05	5.11-05	4.02-05	3.21-05	2.60-05
21	1.14-02	3.49-03	1.50-03	7.76-04	4.53-04	2.86-04	1.92-04	1.35-04	9.87-05	7.41-05	5.70-05	4.48-05	3.57-05	2.89-05
20	1.27-02	3.91-03	1.68-03	8.69-04	5.06-04	3.20-04	2.15-04	1.51-04	1.10-04	8.29-05	6.37-05	4.99-05	3.98-05	3.21-05
19	1.43-02	4.38-03	1.88-03	9.75-04	5.68-04	3.60-04	2.41-04	1.70-04	1.24-04	9.29-05	7.13-05	5.58-05	4.44-05	3.57-05
18	1.61-02	4.94-03	2.12-03	1.10-03	6.41-04	4.05-04	2.72-04	1.91-04	1.39-04	1.05-04	8.02-05	6.26-05	4.96-05	3.96-05
17	1.83-02	5.61-03	2.41-03	1.25-03	7.28-04	4.61-04	3.09-04	2.17-04	1.58-04	1.18-04	9.07-05	7.06-05	5.55-05	4.36-05
16	2.10-02	6.45-03	2.77-03	1.44-03	8.38-04	5.30-04	3.56-04	2.50-04	1.82-04	1.36-04	1.04-04	8.00-05	6.19-05	4.57-05
15	2.44-02	7.51-03	3.23-03	1.68-03	9.78-04	6.18-04	4.15-04	2.91-04	2.11-04	1.57-04	1.19-04	9.07-05	6.61-05	
14	2.89-02	8.90-03	3.83-03	1.99-03	1.16-03	7.35-04	4.93-04	3.46-04	2.50-04	1.85-04	1.38-04	9.89-05		
13	3.47-02	1.07-02	4.63-03	2.41-03	1.41-03	8.90-04	5.97-04	4.18-04	3.01-04	2.19-04	1.54-04			
12	4.24-02	1.31-02	5.69-03	2.97-03	1.74-03	1.10-03	7.39-04	5.14-04	3.65-04	2.51-04				
11	5.28-02	1.64-02	7.16-03	3.75-03	2.21-03	1.40-03	9.34-04	6.42-04	4.30-04					
10	6.71-02	2.10-02	9.24-03	4.88-03	2.88-03	1.83-03	1.21-03	7.84-04						
9	8.78-02	2.77-02	1.23-02	6.58-03	3.90-03	2.45-03	1.53-03							
8	1.20-01	3.81-02	1.72-02	9.27-03	5.47-03	3.26-03								
7	1.73-01	5.55-02	2.55-02	1.37-02	7.70-03									
6	2.71-01	8.79-02	4.07-02	2.08-02										
5	4.77-01	1.55-01	6.83-02											
4	1.00+00	3.05-01												
3	2.77+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.12-06	1.77-06	1.49-06	1.27-06	1.09-06	9.38-07	8.16-07	7.14-07	6.28-07	5.56-07	4.94-07	4.41-07	3.95-07	3.56-07
45	2.90-06	2.42-06	2.04-06	1.73-06	1.49-06	1.28-06	1.12-06	9.77-07	8.59-07	7.60-07	6.75-07	6.02-07	5.40-07	4.85-07
40	4.11-06	3.43-06	2.89-06	2.46-06	2.11-06	1.82-06	1.58-06	1.38-06	1.22-06	1.07-06	9.54-07	8.51-07	7.61-07	6.84-07
35	6.10-06	5.08-06	4.28-06	3.64-06	3.12-06	2.69-06	2.33-06	2.04-06	1.79-06	1.58-06	1.40-06	1.25-06	1.11-06	9.93-07
30	9.50-06	7.91-06	6.66-06	5.65-06	4.83-06	4.16-06	3.61-06	3.14-06	2.75-06	2.41-06	2.11-06	1.85-06	1.59-06	1.30-06
29	1.04-05	8.70-06	7.32-06	6.21-06	5.31-06	4.57-06	3.95-06	3.44-06	3.00-06	2.62-06	2.28-06	1.96-06	1.59-06	
28	1.15-05	9.59-06	8.06-06	6.83-06	5.84-06	5.02-06	4.33-06	3.76-06	3.27-06	2.83-06	2.42-06	1.96-06		
27	1.27-05	1.06-05	8.89-06	7.53-06	6.43-06	5.51-06	4.75-06	4.11-06	3.54-06	3.02-06	2.43-06			
26	1.41-05	1.17-05	9.82-06	8.31-06	7.08-06	6.06-06	5.20-06	4.46-06	3.78-06	3.03-06				
25	1.56-05	1.30-05	1.09-05	9.18-06	7.80-06	6.65-06	5.67-06	4.78-06	3.81-06					
24	1.73-05	1.43-05	1.20-05	1.01-05	8.57-06	7.25-06	6.08-06	4.82-06						
23	1.92-05	1.59-05	1.33-05	1.11-05	9.36-06	7.79-06	6.15-06							
22	2.13-05	1.76-05	1.46-05	1.22-05	1.01-05	7.90-06								
21	2.36-05	1.94-05	1.61-05	1.32-05	1.02-05									
20	2.61-05	2.14-05	1.74-05	1.34-05										
19	2.88-05	2.32-05	1.77-05											
18	3.15-05	2.38-05												
17	3.26-05													

H TE = 1.00+04 NE = 1.00+07 CASE B NC = 24

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	8.51-38	-1.40-37	-7.42-37	-2.10-36	-4.75-36	-9.44-36	-1.72-35	-2.95-35	-4.80-35	-7.49-35	-1.12-34	-1.62-34	-2.26-34
45	0.00+00	1.17-37	-1.93-37	-1.03-36	-2.92-36	-6.63-36	-1.33-35	-2.43-35	-4.20-35	-6.90-35	-1.09-34	-1.65-34	-2.41-34	-3.40-34
40	0.00+00	1.67-37	-2.76-37	-1.48-36	-4.22-36	-9.65-36	-1.95-35	-3.61-35	-6.29-35	-1.05-34	-1.67-34	-2.57-34	-3.83-34	-5.51-34
35	0.00+00	2.53-37	-4.10-37	-2.22-36	-6.40-36	-1.48-35	-3.02-35	-5.67-35	-1.01-34	-1.70-34	-2.78-34	-4.38-34	-6.70-34	-9.93-34
30	0.00+00	4.14-37	-6.24-37	-3.50-36	-1.03-35	-2.41-35	-5.00-35	-9.61-35	-1.75-34	-3.05-34	-5.15-34	-8.44-34	-1.35-33	-2.10-33
29	0.00+00	4.63-37	-6.77-37	-3.85-36	-1.13-35	-2.67-35	-5.58-35	-1.08-34	-1.98-34	-3.48-34	-5.92-34	-9.81-34	-1.59-33	-2.51-33
28	0.00+00	5.21-37	-7.34-37	-4.24-36	-1.25-35	-2.97-35	-6.24-35	-1.21-34	-2.24-34	-3.98-34	-6.85-34	-1.15-33	-1.89-33	-3.04-33
27	0.00+00	5.89-37	-7.91-37	-4.67-36	-1.39-35	-3.31-35	-7.00-35	-1.37-34	-2.55-34	-4.58-34	-7.99-34	-1.36-33	-2.27-33	-3.72-33
26	0.00+00	6.72-37	-8.47-37	-5.14-36	-1.54-35	-3.69-35	-7.86-35	-1.55-34	-2.92-34	-5.30-34	-9.37-34	-1.62-33	-2.76-33	-4.63-33
25	0.00+00	7.73-37	-8.97-37	-5.64-36	-1.71-35	-4.12-35	-8.84-35	-1.76-34	-3.35-34	-6.17-34	-1.11-33	-1.95-33	-3.40-33	-5.86-33
24	0.00+00	9.03-37	-9.06-37	-6.07-36	-1.86-35	-4.54-35	-9.83-35	-1.98-34	-3.82-34	-7.15-34	-1.31-33	-2.36-33	-4.22-33	-7.51-33
23	0.00+00	1.06-36	-9.09-37	-6.57-36	-2.05-35	-5.04-35	-1.10-34	-2.25-34	-4.40-34	-8.38-34	-1.57-33	-2.90-33	-5.36-33	-9.94-33
22	0.00+00	1.26-36	-8.70-37	-7.04-36	-2.23-35	-5.55-35	-1.23-34	-2.54-34	-5.07-34	-9.86-34	-1.89-33	-3.62-33	-6.97-33	-1.36-32
21	0.00+00	1.51-36	-7.66-37	-7.42-36	-2.41-35	-6.08-35	-1.36-34	-2.87-34	-5.83-34	-1.16-33	-2.31-33	-4.60-33	-9.29-33	-1.93-32
20	0.00+00	1.83-36	-5.68-37	-7.66-36	-2.56-35	-6.58-35	-1.50-34	-3.22-34	-6.70-34	-1.38-33	-2.84-33	-5.95-33	-1.28-32	-2.92-32
19	0.00+00	2.25-36	-2.41-37	-7.68-36	-2.69-35	-7.03-35	-1.63-34	-3.58-34	-7.68-34	-1.64-33	-3.55-33	-7.94-33	-1.87-32	-4.82-32
18	0.00+00	2.78-36	2.56-37	-7.42-36	-2.76-35	-7.40-35	-1.75-34	-3.95-34	-8.78-34	-1.97-33	-4.54-33	-1.11-32	-2.95-32	-9.24-32
17	0.00+00	3.48-36	9.68-37	-6.82-36	-2.77-35	-7.67-35	-1.87-34	-4.34-34	-1.01-33	-2.40-33	-6.04-33	-1.66-32	-5.39-32	-2.38-31
16	0.00+00	4.40-36	1.95-36	-5.82-36	-2.72-35	-7.86-35	-1.97-34	-4.76-34	-1.17-33	-3.03-33	-8.61-33	-2.88-32	-1.31-31	-1.31-30
15	0.00+00	5.60-36	3.29-36	-4.34-36	-2.61-35	-7.96-35	-2.07-34	-5.25-34	-1.39-33	-4.07-33	-1.40-32	-6.60-32	-6.79-31	
14	0.00+00	7.23-36	5.18-36	-2.09-36	-2.39-35	-7.91-35	-2.16-34	-5.83-34	-1.73-33	-6.10-33	-2.97-32	-3.15-31		
13	0.00+00	9.49-36	7.94-36	1.55-36	-1.93-35	-7.37-35	-2.13-34	-6.27-34	-2.21-33	-1.10-32	-1.22-31			
12	0.00+00	1.27-35	1.22-35	8.01-36	-8.71-36	-5.30-35	-1.63-34	-5.14-34	-2.41-33	-2.84-32				
11	0.00+00	1.76-35	1.92-35	2.02-35	1.63-35	1.36-35	8.21-35	7.32-34	9.04-33					
10	0.00+00	2.53-35	3.13-35	4.49-35	7.84-35	2.33-34	1.33-33	1.67-32						
9	0.00+00	3.78-35	5.35-35	9.84-35	2.50-34	1.12-33	1.28-32							
8	0.00+00	5.96-35	9.75-35	2.31-34	8.57-34	7.82-33								
7	0.00+00	1.02-34	1.99-34	6.59-34	4.87-33									
6	0.00+00	1.99-34	5.14-34	3.42-33										
5	0.00+00	5.09-34	2.54-33											
4	0.00+00	2.48-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-3.04-34	-3.93-34	-4.90-34	-5.90-34	-6.92-34	-7.94-34	-8.95-34	-9.96-34	-1.10-33	-1.18-33	-1.28-33	-1.39-33	-1.51-33	-1.64-33
45	-4.64-34	-6.09-34	-7.72-34	-9.49-34	-1.14-33	-1.33-33	-1.54-33	-1.76-33	-2.00-33	-2.22-33	-2.52-33	-2.85-33	-3.24-33	-3.70-33
40	-7.67-34	-1.03-33	-1.34-33	-1.70-33	-2.10-33	-2.55-33	-3.06-33	-3.66-33	-4.36-33	-5.11-33	-6.14-33	-7.45-33	-9.15-33	-1.14-32
35	-1.43-33	-1.99-33	-2.70-33	-3.58-33	-4.66-33	-6.00-33	-7.70-33	-9.91-33	-1.29-32	-1.67-32	-2.26-32	-3.15-32	-4.59-32	-7.08-32
30	-3.21-33	-4.77-33	-6.97-33	-1.01-32	-1.44-32	-2.09-32	-3.08-32	-4.69-32	-7.51-32	-1.27-31	-2.46-31	-5.69-31	-1.84-30	-1.32-29
29	-3.89-33	-5.91-33	-8.83-33	-1.31-32	-1.94-32	-2.92-32	-4.51-32	-7.31-32	-1.27-31	-2.44-31	-5.69-31	-1.85-30	-1.33-29	
28	-4.80-33	-7.45-33	-1.14-32	-1.75-32	-2.69-32	-4.25-32	-7.01-32	-1.24-31	-2.43-31	-5.63-31	-1.84-30	-1.34-29		
27	-6.01-33	-9.59-33	-1.52-32	-2.41-32	-3.91-32	-6.57-32	-1.18-31	-2.35-31	-5.57-31	-1.81-30	-1.33-29			
26	-7.68-33	-1.27-32	-2.08-32	-3.48-32	-6.00-32	-1.10-31	-2.22-31	-5.34-31	-1.78-30	-1.30-29				
25	-1.00-32	-1.72-32	-2.98-32	-5.30-32	-9.95-32	-2.06-31	-5.02-31	-1.69-30	-1.24-29					
24	-1.34-32	-2.41-32	-4.44-32	-8.60-32	-1.82-31	-4.54-31	-1.55-30	-1.16-29						
23	-1.86-32	-3.58-32	-7.19-32	-1.57-31	-4.03-31	-1.41-30	-1.08-29							
22	-2.72-32	-5.69-32	-1.29-31	-3.42-31	-1.23-30	-9.62-30								
21	-4.22-32	-1.00-31	-2.75-31	-1.02-30	-8.24-30									
20	-7.23-32	-2.08-31	-8.04-31	-6.70-30										
19	-1.45-31	-5.86-31	-5.09-30											
18	-3.92-31	-3.56-30												
17	-2.2[illegible]-30													

H TE = 1.00+04 NE = 1.00+08 CASE B NC = 20

TOTAL RC = 2.724-13 4-2 RC = 3.222-14 4-2 EM = 1.317-25 2S RC = 9.006-14 2P RC = 1.823-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.50-04	2.91-04	1.25-04	6.49-05	3.78-05	2.40-05	1.61-05	1.14-05	8.31-06	6.26-06	4.83-06	3.80-06	3.05-06	2.48-06
45	1.30-03	4.00-04	1.72-04	8.91-05	5.20-05	3.29-05	2.21-05	1.56-05	1.14-05	8.59-06	6.63-06	5.22-06	4.18-06	3.40-06
40	1.86-03	5.70-04	2.45-04	1.27-04	7.41-05	4.69-05	3.16-05	2.22-05	1.63-05	1.22-05	9.44-06	7.43-06	5.96-06	4.85-06
35	2.78-03	8.53-04	3.66-04	1.90-04	1.11-04	7.01-05	4.71-05	3.32-05	2.43-05	1.83-05	1.41-05	1.11-05	8.88-06	7.23-06
30	4.42-03	1.36-03	5.82-04	3.01-04	1.76-04	1.11-04	7.48-05	5.27-05	3.85-05	2.90-05	2.23-05	1.76-05	1.41-05	1.14-05
29	4.89-03	1.50-03	6.44-04	3.34-04	1.94-04	1.23-04	8.28-05	5.83-05	4.26-05	3.20-05	2.47-05	1.94-05	1.56-05	1.26-05
28	5.43-03	1.67-03	7.15-04	3.70-04	2.16-04	1.37-04	9.19-05	6.47-05	4.73-05	3.55-05	2.74-05	2.16-05	1.73-05	1.40-05
27	6.05-03	1.86-03	7.97-04	4.13-04	2.41-04	1.52-04	1.02-04	7.21-05	5.26-05	3.96-05	3.05-05	2.40-05	1.92-05	1.56-05
26	6.77-03	2.08-03	8.92-04	4.62-04	2.69-04	1.70-04	1.14-04	8.06-05	5.88-05	4.42-05	3.41-05	2.68-05	2.14-05	1.74-05
25	7.61-03	2.33-03	1.00-03	5.18-04	3.02-04	1.91-04	1.28-04	9.04-05	6.60-05	4.96-05	3.82-05	3.01-05	2.40-05	1.95-05
24	8.58-03	2.63-03	1.13-03	5.84-04	3.41-04	2.15-04	1.45-04	1.02-04	7.44-05	5.59-05	4.30-05	3.38-05	2.70-05	2.19-05
23	9.71-03	2.98-03	1.28-03	6.62-04	3.86-04	2.44-04	1.64-04	1.15-04	8.41-05	6.32-05	4.87-05	3.82-05	3.05-05	2.47-05
22	1.10-02	3.39-03	1.45-03	7.52-04	4.38-04	2.77-04	1.86-04	1.31-04	9.55-05	7.18-05	5.52-05	4.33-05	3.46-05	2.80-05
21	1.26-02	3.87-03	1.66-03	8.59-04	5.00-04	3.16-04	2.12-04	1.49-04	1.09-04	8.18-05	6.29-05	4.93-05	3.93-05	3.18-05
20	1.44-02	4.43-03	1.90-03	9.83-04	5.72-04	3.62-04	2.43-04	1.71-04	1.24-04	9.34-05	7.18-05	5.62-05	4.48-05	3.61-05
19	1.66-02	5.09-03	2.19-03	1.13-03	6.58-04	4.16-04	2.79-04	1.96-04	1.43-04	1.07-04	8.22-05	6.43-05	5.11-05	4.10-05
18	1.92-02	5.87-03	2.52-03	1.30-03	7.59-04	4.79-04	3.22-04	2.26-04	1.64-04	1.23-04	9.44-05	7.37-05	5.83-05	4.65-05
17	2.22-02	6.79-03	2.91-03	1.51-03	8.77-04	5.54-04	3.71-04	2.61-04	1.90-04	1.42-04	1.08-04	8.43-05	6.62-05	5.19-05
16	2.57-02	7.87-03	3.38-03	1.74-03	1.01-03	6.41-04	4.29-04	3.01-04	2.19-04	1.63-04	1.24-04	9.59-05	7.40-05	5.46-05
15	2.98-02	9.12-03	3.91-03	2.02-03	1.18-03	7.42-04	4.97-04	3.48-04	2.52-04	1.87-04	1.42-04	1.07-04	7.81-05	
14	3.46-02	1.06-02	4.55-03	2.35-03	1.36-03	8.60-04	5.75-04	4.02-04	2.90-04	2.14-04	1.59-04	1.14-04		
13	4.05-02	1.24-02	5.32-03	2.75-03	1.60-03	1.01-03	6.71-04	4.67-04	3.35-04	2.43-04	1.70-04			
12	4.82-02	1.48-02	6.33-03	3.27-03	1.90-03	1.19-03	7.93-04	5.48-04	3.86-04	2.64-04				
11	5.89-02	1.80-02	7.73-03	3.99-03	2.31-03	1.45-03	9.58-04	6.52-04	4.33-04					
10	7.42-02	2.27-02	9.76-03	5.03-03	2.91-03	1.82-03	1.18-03	7.58-04						
9	9.67-02	2.97-02	1.28-02	6.59-03	3.80-03	2.33-03	1.44-03							
8	1.31-01	4.04-02	1.74-02	8.98-03	5.12-03	2.99-03								
7	1.87-01	5.76-02	2.50-02	1.28-02	6.98-03									
6	2.87-01	8.82-02	3.84-02	1.89-02										
5	4.92-01	1.49-01	6.27-02											
4	1.00+00	2.86-01												
3	2.70+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.05-06	1.71-06	1.44-06	1.22-06	1.05-06	9.07-07	7.89-07	6.91-07	6.08-07	5.38-07	4.78-07	4.27-07	3.82-07	3.44-07
45	2.81-06	2.34-06	1.97-06	1.68-06	1.44-06	1.24-06	1.08-06	9.46-07	8.32-07	7.36-07	6.54-07	5.84-07	5.23-07	4.70-07
40	4.00-06	3.33-06	2.81-06	2.39-06	2.05-06	1.77-06	1.54-06	1.34-06	1.18-06	1.04-06	9.27-07	8.26-07	7.39-07	6.64-07
35	5.66-06	4.96-06	4.18-06	3.55-06	3.04-06	2.63-06	2.28-06	1.99-06	1.75-06	1.54-06	1.37-06	1.22-06	1.09-06	9.70-07
30	9.41-06	7.84-06	6.60-06	5.60-06	4.79-06	4.12-06	3.57-06	3.11-06	2.72-06	2.39-06	2.09-06	1.83-06	1.58-06	1.29-06
29	1.08-05	8.66-06	7.29-06	6.18-06	5.28-06	4.55-06	3.93-06	3.42-06	2.98-06	2.61-06	2.27-06	1.95-06	1.58-06	
28	1.15-05	9.60-06	8.07-06	6.84-06	5.84-06	5.02-06	4.34-06	3.77-06	3.27-06	2.84-06	2.43-06	1.96-06		
27	1.28-05	1.07-05	8.97-06	7.60-06	6.48-06	5.56-06	4.79-06	4.14-06	3.57-06	3.04-06	2.45-06			
26	1.43-05	1.19-05	9.99-06	8.46-06	7.20-06	6.17-06	5.30-06	4.54-06	3.85-06	3.08-06				
25	1.60-05	1.33-05	1.12-05	9.43-06	8.02-06	6.84-06	5.83-06	4.91-06	3.92-06					
24	1.80-05	1.49-05	1.25-05	1.05-05	8.93-06	7.56-06	6.33-06	5.02-06						
23	2.03-05	1.68-05	1.40-05	1.18-05	9.90-06	8.24-06	6.49-06							
22	2.29-05	1.90-05	1.58-05	1.31-05	1.08-05	8.49-06								
21	2.60-05	2.14-05	1.76-05	1.45-05	1.12-05									
20	2.94-05	2.40-05	1.95-05	1.50-05										
19	3.32-05	2.66-05	2.03-05											
18	3.69-05	2.79-05												
17	3.88-05													

H TE = 1.00+04 NE = 1.00+08 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.41-31	8.03-38	-1.68-37	-8.23-37	-2.24-36	-4.91-36	-9.50-36	-1.68-35	-2.76-35	-4.22-35	-5.98-35	-7.82-35	-9.49-35	-1.08-34
45	1.29-30	1.10-37	-2.33-37	-1.14-36	-3.13-36	-6.88-36	-1.34-35	-2.39-35	-3.95-35	-6.09-35	-8.72-35	-1.15-34	-1.42-34	-1.64-34
40	1.84-30	1.57-37	-3.37-37	-1.65-36	-4.55-36	-1.01-35	-1.98-35	-3.56-35	-5.96-35	-9.31-35	-1.35-34	-1.82-34	-2.28-34	-2.69-34
35	2.76-30	2.34-37	-5.13-37	-2.53-36	-7.01-36	-1.57-35	-3.12-35	-5.69-35	-9.69-35	-1.54-34	-2.29-34	-3.16-34	-4.08-34	-4.97-34
30	4.40-30	3.74-37	-8.35-37	-4.15-36	-1.16-35	-2.65-35	-5.37-35	-1.00-34	-1.75-34	-2.88-34	-4.43-34	-6.37-34	-8.61-34	-1.11-33
29	4.88-30	4.15-37	-9.30-37	-4.63-36	-1.30-35	-2.98-35	-6.07-35	-1.14-34	-2.01-34	-3.33-34	-5.17-34	-7.52-34	-1.03-33	-1.35-33
28	5.43-30	4.62-37	-1.04-36	-5.18-36	-1.47-35	-3.37-35	-6.90-35	-1.31-34	-2.32-34	-3.88-34	-6.09-34	-8.97-34	-1.25-33	-1.66-33
27	6.06-30	5.17-37	-1.16-36	-5.83-36	-1.66-35	-3.82-35	-7.89-35	-1.50-34	-2.70-34	-4.56-34	-7.25-34	-1.08-33	-1.53-33	-2.08-33
26	6.80-30	5.81-37	-1.31-36	-6.59-36	-1.88-35	-4.37-35	-9.07-35	-1.75-34	-3.16-34	-5.41-34	-8.74-34	-1.33-33	-1.92-33	-2.67-33
25	7.66-30	6.57-37	-1.48-36	-7.48-36	-2.15-35	-5.02-35	-1.05-34	-2.04-34	-3.75-34	-6.50-34	-1.07-33	-1.66-33	-2.45-33	-3.50-33
24	8.68-30	7.48-37	-1.67-36	-8.52-36	-2.46-35	-5.80-35	-1.23-34	-2.41-34	-4.49-34	-7.92-34	-1.32-33	-2.10-33	-3.19-33	-4.72-33
23	9.89-30	8.58-37	-1.90-36	-9.76-36	-2.84-35	-6.76-35	-1.45-34	-2.88-34	-5.44-34	-9.78-34	-1.67-33	-2.73-33	-4.29-33	-6.60-33
22	1.13-29	9.94-37	-2.16-36	-1.12-35	-3.30-35	-7.92-35	-1.72-34	-3.47-34	-6.68-34	-1.23-33	-2.16-33	-3.65-33	-5.96-33	-9.66-33
21	1.31-29	1.16-36	-2.45-36	-1.30-35	-3.84-35	-9.35-35	-2.06-34	-4.24-34	-8.34-34	-1.58-33	-2.86-33	-5.03-33	-8.65-33	-1.50-32
20	1.52-29	1.38-36	-2.76-36	-1.49-35	-4.49-35	-1.11-34	-2.48-34	-5.22-34	-1.05-33	-2.06-33	-3.90-33	-7.20-33	-1.32-32	-2.49-32
19	1.78-29	1.66-36	-3.10-36	-1.73-35	-5.28-35	-1.32-34	-3.02-34	-6.53-34	-1.36-33	-2.77-33	-5.52-33	-1.09-32	-2.18-32	-4.67-32
18	2.10-29	2.03-36	-3.43-36	-2.00-35	-6.21-35	-1.59-34	-3.72-34	-8.30-34	-1.80-33	-3.86-33	-8.22-33	-1.77-32	-4.02-32	-1.04-31
17	2.51-29	2.54-36	-3.70-36	-2.30-35	-7.31-35	-1.92-34	-4.62-34	-1.07-33	-2.45-33	-5.60-33	-1.30-32	-3.19-32	-8.80-32	-3.22-31
16	3.03-29	3.25-36	-3.80-36	-2.60-35	-8.55-35	-2.31-34	-5.78-34	-1.41-33	-3.43-33	-8.59-33	-2.27-32	-6.76-32	-2.63-31	-2.16-30
15	3.71-29	4.25-36	-3.56-36	-2.89-35	-9.89-35	-2.77-34	-7.27-34	-1.89-33	-5.03-33	-1.43-32	-4.61-32	-1.94-31	-1.70-30	
14	4.61-29	5.71-36	-2.74-36	-3.11-35	-1.12-34	-3.30-34	-9.21-34	-2.60-33	-7.87-33	-2.72-32	-1.24-31	-1.18-30		
13	5.83-29	7.82-36	-1.03-36	-3.22-35	-1.26-34	-3.92-34	-1.19-33	-3.78-33	-1.39-32	-6.79-32	-7.03-31			
12	7.53-29	1.09-35	1.93-36	-3.18-35	-1.39-34	-4.72-34	-1.60-33	-6.15-33	-3.17-32	-3.50-31				
11	9.98-29	1.55-35	6.72-36	-3.00-35	-1.57-34	-5.99-34	-2.42-33	-1.30-32	-1.49-31					
10	1.36-28	2.26-35	1.47-35	-2.54-35	-1.84-34	-8.42-34	-4.69-33	-5.55-32						
9	1.94-28	3.45-35	2.98-35	-1.16-35	-2.16-34	-1.38-33	-1.66-32							
8	2.92-28	5.59-35	6.20-35	3.74-35	-1.77-34	-2.46-33								
7	4.71-28	9.93-35	1.44-34	2.57-34	1.39-33									
6	8.46-28	2.02-34	4.19-34	2.16-33										
5	1.81-27	5.21-34	2.22-33											
4	5.41-27	2.50-33												
3	3.92-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.16-34	-1.20-34	-1.19-34	-1.13-34	-1.03-34	-8.45-35	-6.35-35	-3.60-35	-8.21-37	4.37-35	1.00-34	1.71-34	2.61-34	3.75-34
45	-1.80-34	-1.89-34	-1.92-34	-1.88-34	-1.78-34	-1.54-34	-1.26-34	-8.77-35	-3.49-35	3.57-35	1.30-34	2.57-34	4.26-34	6.56-34
40	-3.02-34	-3.28-34	-3.44-34	-3.52-34	-3.50-34	-3.26-34	-2.96-34	-2.46-34	-1.68-34	-5.15-35	1.23-34	3.82-34	7.73-34	1.37-33
35	-5.80-34	-6.57-34	-7.27-34	-7.91-34	-8.47-34	-8.70-34	-8.97-34	-8.97-34	-8.48-34	-7.16-34	-4.23-34	1.69-34	1.38-33	3.92-33
30	-1.38-33	-1.68-33	-2.03-33	-2.45-33	-2.98-33	-3.58-33	-4.47-33	-5.75-33	-7.66-33	-1.08-32	-1.63-32	-2.78-32	-5.83-32	-1.91-31
29	-1.71-33	-2.13-33	-2.63-33	-3.27-33	-4.12-33	-5.20-33	-6.89-33	-9.56-33	-1.41-32	-2.31-32	-4.40-32	-1.13-31	-6.09-31	
28	-2.15-33	-2.74-33	-3.50-33	-4.51-33	-5.93-33	-7.91-33	-1.13-32	-1.73-32	-2.93-32	-5.91-32	-1.63-31	-9.89-31		
27	-2.76-33	-3.63-33	-4.79-33	-6.44-33	-8.95-33	-1.28-32	-2.01-32	-3.50-32	-7.29-32	-2.11-31	-1.34-30			
26	-3.64-33	-4.94-33	-6.81-33	-9.65-33	-1.44-32	-2.25-32	-4.02-32	-8.58-32	-2.54-31	-1.67-30				
25	-4.93-33	-6.99-33	-1.01-32	-1.54-32	-2.50-32	-4.47-32	-9.71-32	-2.94-31	-1.97-30					
24	-6.94-33	-1.03-32	-1.60-32	-2.66-32	-4.91-32	-1.07-31	-3.28-31	-2.24-30						
23	-1.02-32	-1.63-32	-2.76-32	-5.18-32	-1.16-31	-3.57-31	-2.47-30							
22	-1.59-32	-2.78-32	-5.33-32	-1.21-31	-3.83-31	-2.66-30								
21	-2.70-32	-5.32-32	-1.24-31	-3.97-31	-2.78-30									
20	-5.08-32	-1.21-31	-3.97-31	-2.85-30										
19	-1.15-31	-3.88-31	-2.84-30											
18	-3.63-31	-2.74-30												
17	-2.51-30													

H TE = 1.00+04 NE = 1.00+09 CASE B NC = 20

TOTAL RC = 2.847-13 4-2 RC = 3.447-14 4-2 EM = 1.409-25 2S RC = 9.210-14 2P RC = 1.926-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.88-04	2.72-04	1.17-04	6.07-05	3.54-05	2.24-05	1.51-05	1.06-05	7.77-06	5.85-06	4.52-06	3.56-06	2.85-06	2.32-06
45	1.22-03	3.74-04	1.61-04	8.33-05	4.86-05	3.08-05	2.07-05	1.46-05	1.07-05	8.03-06	6.20-06	4.88-06	3.91-06	3.18-06
40	1.74-03	5.34-04	2.29-04	1.19-04	6.93-05	4.39-05	2.95-05	2.08-05	1.52-05	1.14-05	8.83-06	6.95-06	5.57-06	4.53-06
35	2.60-03	7.99-04	3.43-04	1.78-04	1.04-04	6.56-05	4.41-05	3.11-05	2.27-05	1.71-05	1.32-05	1.04-05	8.32-06	6.77-06
30	4.15-03	1.27-03	5.47-04	2.83-04	1.65-04	1.05-04	7.03-05	4.95-05	3.62-05	2.72-05	2.10-05	1.65-05	1.32-05	1.07-05
29	4.60-03	1.41-03	6.[illegible]-04	3.14-04	1.83-04	1.16-04	7.78-05	5.48-05	4.00-05	3.01-05	2.32-05	1.83-05	1.46-05	1.19-05
28	5.11-03	1.57-03	6.[illegible]-04	3.49-04	2.03-04	1.29-04	8.65-05	6.09-05	4.45-05	3.35-05	2.58-05	2.03-05	1.62-05	1.32-05
27	5.71-03	1.75-03	7.52-[illegible]	3.89-04	2.27-04	1.44-04	9.66-05	6.80-05	4.96-05	3.73-05	2.88-05	2.26-05	1.81-05	1.47-05
26	6.40-03	1.96-03	8.43-0[illegible]	4.36-04	2.54-04	1.61-04	1.08-04	7.62-05	5.56-05	4.18-05	3.22-05	2.53-05	2.03-05	1.65-05
25	7.21-03	2.21-03	9.49-0[illegible]	4.91-04	2.86-04	1.81-04	1.22-04	8.57-05	6.26-05	4.70-05	3.62-05	2.85-05	2.28-05	1.85-05
24	8.16-03	2.50-03	1.07-03	5.56-04	3.24-04	2.05-04	1.38-04	9.69-05	7.07-05	5.32-05	4.09-05	3.22-05	2.57-05	2.09-05
23	9.28-03	2.85-03	1.22-03	6.32-04	3.68-04	2.33-04	1.57-04	1.10-04	8.04-05	6.04-05	4.65-05	3.65-05	2.92-05	2.36-05
22	1.06-02	3.25-03	1.40-03	7.23-04	4.21-04	2.66-04	1.79-04	1.26-04	9.18-05	6.90-05	5.31-05	4.16-05	3.32-05	2.69-05
21	1.22-02	3.75-03	1.61-03	8.32-04	4.84-04	3.06-04	2.06-04	1.45-04	1.05-04	7.92-05	6.09-05	4.78-05	3.81-05	3.08-05
20	1.42-02	4.34-03	1.86-03	9.63-04	5.61-04	3.54-04	2.38-04	1.67-04	1.22-04	9.15-05	7.03-05	5.51-05	4.38-05	3.53-05
19	1.65-02	5.06-03	2.17-03	1.12-03	6.53-04	4.13-04	2.77-04	1.95-04	1.42-04	1.06-04	8.16-05	6.38-05	5.07-05	4.07-05
18	1.94-02	5.94-03	2.55-03	1.32-03	7.67-04	4.85-04	3.25-04	2.28-04	1.66-04	1.24-04	9.53-05	7.44-05	5.88-05	4.69-05
17	2.30-02	7.03-03	3.02-03	1.56-03	9.07-04	5.73-04	3.84-04	2.69-04	1.96-04	1.46-04	1.12-04	8.70-05	6.83-05	5.35-05
16	2.74-02	8.39-03	3.60-03	1.86-03	1.08-03	6.82-04	4.57-04	3.20-04	2.32-04	1.73-04	1.32-04	1.02-04	7.86-05	5.79-05
15	3.29-02	1.01-02	4.32-03	2.23-03	1.30-03	8.18-04	5.47-04	3.83-04	2.77-04	2.06-04	1.56-04	1.18-04	8.57-05	
14	3.99-02	1.22-02	5.23-03	2.70-03	1.57-03	9.87-04	6.59-04	4.60-04	3.32-04	2.45-04	1.82-04	1.30-04		
13	4.85-02	1.48-02	6.35-03	3.27-03	1.90-03	1.19-0[illegible]	7.96-04	5.53-04	3.96-04	2.87-04	2.01-04			
12	5.90-02	1.80-02	7.72-03	3.97-03	2.30-03	1.44-03	9.59-04	6.62-04	4.66-04	3.18-04				
11	7.17-02	2.19-02	9.37-03	4.82-03	2.78-03	1.74-03	1.15-03	7.79-04	5.16-04					
10	8.74-02	2.67-02	1.14-02	5.85-03	3.37-03	2.09-03	1.36-03	8.66-04						
9	1.09-01	3.32-02	1.41-02	7.23-03	4.14-03	2.53-03	1.54-03							
8	1.42-01	4.32-02	1.84-02	9.34-03	5.26-03	3.03-03								
7	1.98-01	6.00-02	2.54-02	1.27-02	6.77-03									
6	2.97-01	8.98-02	3.76-02	1.78-02										
5	5.00-01	1.48-01	5.87-02											
4	1.00+00	2.69-01												
3	2.62+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.91-06	1.60-06	1.35-06	1.14-06	9.82-07	8.48-07	7.38-07	6.46-07	5.68-07	5.03-07	4.47-07	3.99-07	3.58-07	3.22-07
45	2.63-06	2.19-06	1.85-06	1.57-06	1.35-06	1.16-06	1.01-06	8.85-07	7.78-07	6.88-07	6.12-07	5.46-07	4.89-07	4.40-07
40	3.74-06	3.12-06	2.63-06	2.23-06	1.91-06	1.65-06	1.44-06	1.26-06	1.11-06	9.77-07	8.67-07	7.73-07	6.92-07	6.21-07
35	5.58-06	4.65-06	3.92-06	3.33-06	2.85-06	2.46-06	2.14-06	1.87-06	1.64-06	1.45-06	1.28-06	1.14-06	1.02-06	9.09-07
30	8.84-06	7.37-06	6.20-06	5.26-06	4.50-06	3.87-06	3.36-06	2.92-06	2.56-06	2.24-06	1.97-06	1.72-06	1.48-06	1.21-06
29	9.78-06	8.15-06	6.85-06	5.81-06	4.97-06	4.28-06	3.70-06	3.22-06	2.81-06	2.45-06	2.13-06	1.83-06	1.49-06	
28	1.09-05	9.04-06	7.60-06	6.44-06	5.50-06	4.73-06	4.09-06	3.55-06	3.08-06	2.67-06	2.29-06	1.85-06		
27	1.21-05	1.01-05	8.46-06	7.16-06	6.11-06	5.25-06	4.52-06	3.91-06	3.37-06	2.87-06	2.31-06			
26	1.35-05	1.13-05	9.44-06	7.99-06	6.81-06	5.83-06	5.01-06	4.29-06	3.64-06	2.92-06				
25	1.52-05	1.26-05	1.06-05	8.94-06	7.60-06	6.48-06	5.52-06	4.65-06	3.71-06					
24	1.71-05	1.42-05	1.19-05	1.00-05	8.49-06	7.19-06	6.02-06	4.77-06						
23	1.94-05	1.61-05	1.34-05	1.13-05	9.46-06	7.87-06	6.20-06							
22	2.20-05	1.82-05	1.52-05	1.26-05	1.04-05	8.16-06								
21	2.51-05	2.07-05	1.71-05	1.40-05	1.09-05									
20	2.88-05	2.35-05	1.91-05	1.47-05										
19	3.29-05	2.64-05	2.02-05											
18	3.72-05	2.81-05												
17	4.00-05													

H TE = 1.00+04 NE = 1.00+09 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.17-31	5.07-38	-2.14-37	-8.41-37	-2.12-36	-4.41-36	-7.90-36	-1.22-35	-1.58-35	-1.71-35	-1.56-35	-1.14-35	-4.64-36	4.51-36
45	2.98-31	6.93-38	-2.97-37	-1.17-36	-2.96-36	-6.18-36	-1.12-35	-1.73-35	-2.26-35	-2.49-35	-2.31-35	-1.74-35	-7.96-36	5.19-36
40	4.25-31	9.84-38	-4.29-37	-1.69-36	-4.32-36	-9.08-36	-1.65-35	-2.59-35	-3.43-35	-3.84-35	-3.66-35	-2.88-35	-1.50-35	4.88-36
35	6.36-31	1.46-37	-6.54-37	-2.59-36	-6.67-36	-1.42-35	-2.62-35	-4.17-35	-5.63-35	-6.47-35	-6.39-35	-5.33-35	-3.24-35	-2.66-37
30	1.01-30	2.31-37	-1.07-36	-4.29-36	-1.12-35	-2.42-35	-4.55-35	-7.43-35	-1.04-34	-1.24-34	-1.29-34	-1.17-34	-8.58-35	-3.01-35
29	1.12-30	2.55-37	-1.20-36	-4.79-36	-1.25-35	-2.72-35	-5.16-35	-8.48-35	-1.19-34	-1.44-34	-1.53-34	-1.42-34	-1.08-34	-4.54-35
28	1.25-30	2.83-37	-1.34-36	-5.39-36	-1.41-35	-3.09-35	-5.88-35	-9.75-35	-1.39-34	-1.69-34	-1.82-34	-1.73-34	-1.38-34	-6.79-35
27	1.40-30	3.15-37	-1.51-36	-6.08-36	-1.60-35	-3.52-35	-6.76-35	-1.13-34	-1.62-34	-2.01-34	-2.20-34	-2.15-34	-1.79-34	-1.01-34
26	1.57-30	3.52-37	-1.71-36	-6.91-36	-1.83-35	-4.05-35	-7.83-35	-1.32-34	-1.92-34	-2.42-34	-2.70-34	-2.71-34	-2.37-34	-1.52-34
25	1.77-30	3.95-37	-1.95-36	-7.89-36	-2.10-35	-4.68-35	-9.14-35	-1.56-34	-2.30-34	-2.94-34	-3.37-34	-3.48-34	-3.20-34	-2.32-34
24	2.00-30	4.46-37	-2.23-36	-9.07-36	-2.43-35	-5.46-35	-1.08-34	-1.86-34	-2.78-34	-3.64-34	-4.27-34	-4.58-34	-4.45-34	-3.61-34
23	2.28-30	5.06-37	-2.57-36	-1.05-35	-2.84-35	-6.43-35	-1.28-34	-2.25-34	-3.43-34	-4.58-34	-5.54-34	-6.19-34	-6.38-34	-5.77-34
22	2.61-30	5.78-37	-2.99-36	-1.23-35	-3.34-35	-7.66-35	-1.55-34	-2.76-34	-4.29-34	-5.89-34	-7.37-34	-8.63-34	-9.52-34	-9.63-34
21	3.01-30	6.64-37	-3.49-36	-1.44-35	-3.97-35	-9.22-35	-1.89-34	-3.44-34	-5.49-34	-7.77-34	-1.01-33	-1.25-33	-1.49-33	-1.70-33
20	3.50-30	7.71-37	-4.12-36	-1.71-35	-4.77-35	-1.12-34	-2.35-34	-4.38-34	-7.18-34	-1.06-33	-1.44-33	-1.90-33	-2.47-33	-3.22-33
19	4.09-30	9.03-37	-4.90-36	-2.06-35	-5.81-35	-1.39-34	-2.98-34	-5.70-34	-9.68-34	-1.49-33	-2.16-33	-3.08-33	-4.47-33	-6.88-33
18	4.84-30	1.07-36	-5.87-36	-2.50-35	-7.17-35	-1.75-34	-3.85-34	-7.63-34	-1.35-33	-2.20-33	-3.43-33	-5.42-33	-9.13-33	-1.77-32
17	5.78-30	1.29-36	-7.11-36	-3.07-35	-8.98-35	-2.25-34	-5.12-34	-1.06-33	-1.98-33	-3.45-33	-5.94-33	-1.08-32	-2.24-32	-6.31-32
16	6.98-30	1.59-36	-8.67-36	-3.82-35	-1.14-34	-2.96-34	-7.00-34	-1.52-33	-3.06-33	-5.87-33	-1.15-32	-2.57-32	-7.70-32	-4.99-31
15	8.54-30	2.01-36	-1.06-35	-4.81-35	-1.48-34	-4.00-34	-9.94-34	-2.32-33	-5.11-33	-1.12-32	-2.69-32	-8.57-32	-5.86-31	
14	1.06-29	2.64-36	-1.31-35	-6.11-35	-1.96-34	-5.55-34	-1.48-33	-3.78-33	-9.49-33	-2.54-32	-8.73-32	-6.31-31		
13	1.34-29	3.63-36	-1.59-35	-7.82-35	-2.63-34	-7.96-34	-2.32-33	-6.77-33	-2.09-32	-7.96-32	-6.20-31			
12	1.73-29	5.30-36	-1.88-35	-9.96-35	-3.58-34	-1.18-33	-3.94-33	-1.41-32	-6.20-32	-5.38-31				
11	2.30-29	8.21-36	-2.08-35	-1.25-34	-4.91-34	-1.85-33	-7.52-33	-3.85-32	-3.87-31					
10	3.14-29	1.34-35	-2.03-35	-1.52-34	-6.81-34	-3.11-33	-1.81-32	-2.12-31						
9	4.48-29	2.26-35	-1.52-35	-1.81-34	-1.00-33	-6.45-33	-8.49-32							
8	6.72-29	3.95-35	-2.30-36	-2.29-34	-1.83-33	-2.63-32								
7	1.08-28	7.38-35	3.14-35	-3.38-34	-6.41-33									
6	1.95-28	1.58-34	1.56-34	-6.60-34										
5	4.17-28	4.38-34	1.03-33											
4	1.25-27	2.18-33												
3	9.04-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.61-35	3.05-35	4.79-35	6.90-35	9.44-35	1.26-34	1.63-34	2.08-34	2.63-34	3.31-34	4.13-34	5.14-34	6.40-34	7.96-34
45	2.23-35	4.38-35	7.06-35	1.04-34	1.45-34	1.97-34	2.61-34	3.41-34	4.42-34	5.70-34	7.32-34	9.42-34	1.21-33	1.57-33
40	3.16-35	6.65-35	1.11-34	1.69-34	2.44-34	3.42-34	4.69-34	6.35-34	8.57-34	1.15-33	1.56-33	2.13-33	2.93-33	4.09-33
35	4.54-35	1.08-34	1.94-34	3.12-34	4.73-34	7.02-34	1.02-33	1.48-33	2.16-33	3.18-33	4.78-33	7.38-33	1.19-32	2.01-32
30	5.79-35	1.92-34	3.96-34	7.07-34	1.19-33	1.99-33	3.31-33	5.62-33	1.00-32	1.90-32	4.02-32	1.02-31	3.56-31	2.77-30
29	5.66-35	2.17-34	4.69-34	8.69-34	1.52-33	2.64-33	4.60-33	8.30-33	1.60-32	3.43-32	8.76-32	3.10-31	2.42-30	
28	5.10-35	2.46-34	5.63-34	1.09-33	1.99-33	3.63-33	6.73-33	1.32-32	2.88-32	7.42-32	2.65-31	2.09-30		
27	3.77-35	2.76-34	6.84-34	1.40-33	2.69-33	5.25-33	1.06-32	2.35-32	6.18-32	2.23-31	1.78-30			
26	1.03-35	3.06-34	8.44-34	1.85-33	3.83-33	8.17-33	1.87-32	4.99-32	1.84-31	1.48-30				
25	-4.31-35	3.28-34	1.06-33	2.55-33	5.83-33	1.41-32	3.91-32	1.47-31	1.21-30					
24	-1.48-34	3.22-34	1.35-33	3.71-33	9.77-33	2.88-32	1.12-31	9.42-31						
23	-3.53-34	2.37-34	1.74-33	5.86-33	1.92-32	8.10-32	7.13-31							
22	-7.85-34	-8.82-35	2.20-33	1.05-32	5.09-32	4.88-31								
21	-1.76-33	-1.17-33	2.33-33	2.36-32	2.90-31									
20	-4.17-33	-4.99-33	-1.17-33	9.89-32										
19	-1.18-32	-2.45-32	-7.94-32											
18	-4.53-32	-2.40-31												
17	-3.81-31													

N TE = 1.00+04 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 3.082-13 4-2 RC = 3.751-14 4-2 EM = 1.533-25 2S RC = 8.350-14 2P RC = 2.247-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.16-04	2.50-04	1.08-04	5.57-05	3.25-05	2.06-05	1.39-05	9.77-06	7.14-06	5.38-06	4.15-06	3.27-06	2.62-06	2.13-06
45	1.12-03	3.44-04	1.48-04	7.65-05	4.47-05	2.83-05	1.90-05	1.34-05	9.80-06	7.38-06	5.70-06	4.49-06	3.60-06	2.93-06
40	1.60-03	4.91-04	2.11-04	1.09-04	6.37-05	4.03-05	2.71-05	1.91-05	1.40-05	1.05-05	8.12-06	6.39-06	5.12-06	4.17-06
35	2.39-03	7.34-04	3.15-04	1.63-04	9.53-05	6.03-05	4.06-05	2.86-05	2.09-05	1.57-05	1.21-05	9.55-06	7.65-06	6.22-06
30	3.82-03	1.17-03	5.03-04	2.60-04	1.52-04	9.61-05	6.46-05	4.55-05	3.33-05	2.50-05	1.93-05	1.52-05	1.22-05	9.88-06
29	4.23-03	1.30-03	5.57-04	2.89-04	1.68-04	1.06-04	7.16-05	5.04-05	3.68-05	2.77-05	2.14-05	1.68-05	1.35-05	1.09-05
28	4.71-03	1.44-03	6.20-04	3.21-04	1.87-04	1.18-04	7.96-05	5.61-05	4.09-05	3.08-05	2.37-05	1.87-05	1.49-05	1.21-05
27	5.26-03	1.61-03	6.92-04	3.58-04	2.09-04	1.32-04	8.89-05	6.26-05	4.57-05	3.44-05	2.65-05	2.08-05	1.67-05	1.35-05
26	5.90-03	1.81-03	7.76-04	4.02-04	2.34-04	1.48-04	9.96-05	7.01-05	5.12-05	3.85-05	2.97-05	2.33-05	1.87-05	1.52-05
25	6.64-03	2.04-03	8.75-04	4.53-04	2.64-04	1.67-04	1.12-04	7.90-05	5.77-05	4.33-05	3.34-05	2.62-05	2.10-05	1.70-05
24	7.52-03	2.31-03	9.90-04	5.13-04	2.99-04	1.89-04	1.27-04	8.94-05	6.52-05	4.90-05	3.77-05	2.97-05	2.37-05	1.92-05
23	8.56-03	2.63-03	1.13-03	5.83-04	3.40-04	2.15-04	1.44-04	1.02-04	7.42-05	5.57-05	4.29-05	3.37-05	2.69-05	2.18-05
22	9.81-03	3.01-03	1.29-03	6.68-04	3.89-04	2.46-04	1.65-04	1.16-04	8.48-05	6.37-05	4.90-05	3.85-05	3.07-05	2.49-05
21	1.13-02	3.47-03	1.49-03	7.70-04	4.48-04	2.83-04	1.90-04	1.34-04	9.76-05	7.33-05	5.53-05	4.42-05	3.52-05	2.85-05
20	1.31-02	4.02-03	1.73-03	8.93-04	5.20-04	3.29-04	2.21-04	1.55-04	1.13-04	8.49-05	6.52-05	5.11-05	4.07-05	3.28-05
19	1.54-02	4.71-03	2.02-03	1.04-03	6.08-04	3.84-04	2.58-04	1.81-04	1.32-04	9.90-05	7.59-05	5.94-05	4.72-05	3.79-05
18	1.81-02	5.56-03	2.38-03	1.23-03	7.17-04	4.53-04	3.04-04	2.13-04	1.55-04	1.16-04	8.91-05	6.95-05	5.50-05	4.38-05
17	2.16-02	6.62-03	2.84-03	1.47-03	8.54-04	5.39-04	3.61-04	2.54-04	1.84-04	1.38-04	1.05-04	8.19-05	6.43-05	5.04-05
16	2.60-02	7.97-03	3.42-03	1.77-03	1.03-03	6.48-04	4.34-04	3.04-04	2.21-04	1.65-04	1.25-04	9.67-05	7.46-05	5.50-05
15	3.17-02	9.72-03	4.17-03	2.15-03	1.25-03	7.88-04	5.27-04	3.69-04	2.67-04	1.98-04	1.50-04	1.14-04	8.25-05	
14	3.92-02	1.20-02	5.14-03	2.65-03	1.54-03	9.70-04	6.48-04	4.52-04	3.26-04	2.40-04	1.79-04	1.27-04		
13	4.91-02	1.50-02	6.43-03	3.32-03	1.92-03	1.21-03	8.06-04	5.60-04	4.01-04	2.90-04	2.03-04			
12	6.24-02	1.91-02	8.16-03	4.20-03	2.43-03	1.53-03	1.01-03	6.99-04	4.92-04	3.35-04				
11	8.05-02	2.46-02	1.05-02	5.40-03	3.12-03	1.95-03	1.28-03	8.70-04	5.76-04					
10	1.05-01	3.20-02	1.36-02	7.00-03	4.03-03	2.50-03	1.62-03	1.03-03						
9	1.37-01	4.17-02	1.77-02	9.06-03	5.17-03	3.15-03	1.92-03							
8	1.77-01	5.39-02	2.28-02	1.16-02	6.50-03	3.73-03								
7	2.31-01	7.01-02	2.95-02	1.47-02	7.77-03									
6	3.25-01	9.76-02	4.04-02	1.90-02										
5	5.19-01	1.53-01	5.98-02											
4	1.00+00	2.74-01												
3	2.62+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.76-06	1.47-06	1.24-06	1.05-06	9.02-07	7.80-07	6.78-07	5.93-07	5.22-07	4.62-07	4.11-07	3.67-07	3.29-07	2.96-07
45	2.41-06	2.01-06	1.70-06	1.44-06	1.24-06	1.07-06	9.29-07	8.13-07	7.15-07	6.33-07	5.62-07	5.02-07	4.49-07	4.04-07
40	3.44-06	2.87-06	2.41-06	2.05-06	1.76-06	1.52-06	1.32-06	1.16-06	1.02-06	8.98-07	7.97-07	7.10-07	6.36-07	5.71-07
35	5.13-06	4.27-06	3.60-06	3.06-06	2.62-06	2.26-06	1.96-06	1.72-06	1.51-06	1.33-06	1.18-06	1.05-06	9.39-07	8.36-07
30	8.13-06	6.78-06	5.70-06	4.84-06	4.14-06	3.56-06	3.09-06	2.69-06	2.35-06	2.06-06	1.81-06	1.58-06	1.37-06	1.11-06
29	9.00-06	7.50-06	6.30-06	5.35-06	4.57-06	3.93-06	3.40-06	2.96-06	2.58-06	2.25-06	1.96-06	1.69-06	1.37-06	
28	1.00-05	8.32-06	6.99-06	5.93-06	5.06-06	4.35-06	3.76-06	3.26-06	2.83-06	2.46-06	2.10-06	1.70-06		
27	1.11-05	9.27-06	7.79-06	6.60-06	5.63-06	4.83-06	4.16-06	3.60-06	3.10-06	2.54-06	2.13-06			
26	1.25-05	1.04-05	8.70-06	7.36-06	6.27-06	5.37-06	4.61-06	3.95-06	3.35-06	2.68-06				
25	1.40-05	1.16-05	9.75-06	8.24-06	7.00-06	5.97-06	5.09-06	4.29-06	3.42-06					
24	1.58-05	1.31-05	1.10-05	9.25-06	7.83-06	6.63-06	5.55-06	4.40-06						
23	1.79-05	1.48-05	1.24-05	1.04-05	8.73-06	7.27-06	5.72-06							
22	2.04-05	1.68-05	1.40-05	1.17-05	9.63-06	7.54-06								
21	2.33-05	1.92-05	1.58-05	1.30-05	1.01-05									
20	2.67-05	2.18-05	1.77-05	1.36-05										
19	3.06-05	2.46-05	1.88-05											
18	3.48-05	2.63-05												
17	3.76-05													

N TE = 1.00+04 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.67-32	8.62-39	-2.15-37	-7.07-37	-1.57-36	-2.45-36	-2.30-36	-4.62-37	2.91-36	7.57-36	1.35-35	2.07-35	2.95-35	4.01-35
45	3.66-32	1.15-38	-2.97-37	-9.83-37	-2.19-36	-3.45-36	-3.28-36	-7.46-37	3.98-36	1.06-35	1.91-35	2.97-35	4.27-35	5.86-35
40	5.23-32	1.58-38	-4.30-37	-1.43-36	-3.21-36	-5.09-36	-4.93-36	-1.30-36	5.64-36	1.56-35	2.85-35	4.50-35	6.57-35	9.17-35
35	7.82-32	2.22-38	-6.55-37	-2.19-36	-4.97-36	-8.00-36	-7.98-36	-2.52-36	8.33-36	2.43-35	4.57-35	7.37-35	1.10-34	1.58-34
30	1.25-31	3.18-38	-1.08-36	-3.63-36	-8.36-36	-1.38-35	-1.43-35	-5.62-36	1.28-35	4.11-35	8.11-35	1.36-34	2.12-34	3.16-34
29	1.38-31	3.42-38	-1.20-36	-4.06-36	-9.40-36	-1.56-35	-1.64-35	-6.75-36	1.40-35	4.63-35	9.25-35	1.57-34	2.47-34	3.74-34
28	1.54-31	3.68-38	-1.35-36	-4.57-36	-1.06-35	-1.77-35	-1.88-35	-8.19-36	1.53-35	5.25-35	1.06-34	1.83-34	2.91-34	4.47-34
27	1.72-31	3.94-38	-1.52-36	-5.17-36	-1.21-35	-2.03-35	-2.19-35	-1.00-35	1.67-35	5.97-35	1.23-34	2.15-34	3.47-34	5.42-34
26	1.93-31	4.23-38	-1.72-36	-5.88-36	-1.38-35	-2.34-35	-2.56-35	-1.24-35	1.82-35	6.85-35	1.44-34	2.55-34	4.20-34	6.70-34
25	2.17-31	4.51-38	-1.96-36	-6.73-36	-1.59-35	-2.72-35	-3.03-35	-1.56-35	1.98-35	7.90-35	1.70-34	3.07-34	5.17-34	8.44-34
24	2.46-31	4.78-38	-2.25-36	-7.76-36	-1.85-35	-3.19-35	-3.62-35	-1.98-35	2.12-35	9.18-35	2.03-34	3.76-34	6.49-34	1.09-33
23	2.80-31	5.03-38	-2.60-36	-9.01-36	-2.16-35	-3.78-35	-4.38-35	-2.56-35	2.24-35	1.08-34	2.46-34	4.69-34	8.34-34	1.45-33
22	3.21-31	5.23-38	-3.03-36	-1.06-35	-2.56-35	-4.54-35	-5.37-35	-3.37-35	2.30-35	1.27-34	3.03-34	5.98-34	1.10-33	2.02-33
21	3.70-31	5.33-38	-3.55-36	-1.25-35	-3.06-35	-5.52-35	-6.71-35	-4.52-35	2.22-35	1.52-34	3.80-34	7.84-34	1.52-33	2.96-33
20	4.30-31	5.27-38	-4.22-36	-1.49-35	-3.71-35	-6.81-35	-8.53-35	-6.21-35	1.86-35	1.83-34	4.90-34	1.07-33	2.21-33	4.66-33
19	5.04-31	4.93-38	-5.06-36	-1.81-35	-4.56-35	-8.56-35	-1.11-34	-8.79-35	9.24-36	2.22-34	6.48-34	1.52-33	3.43-33	8.18-33
18	5.95-31	4.15-38	-6.14-36	-2.23-35	-5.71-35	-1.10-34	-1.48-34	-1.28-34	-1.18-35	2.71-34	8.92-34	2.31-33	5.92-33	1.71-32
17	7.11-31	2.70-38	-7.57-36	-2.78-35	-7.29-35	-1.45-34	-2.05-34	-1.96-34	-5.81-35	3.27-34	1.29-33	3.86-33	1.21-32	4.89-32
16	8.59-31	1.89-39	-9.48-36	-3.55-35	-9.54-35	-1.96-34	-2.95-34	-3.13-34	-1.62-34	3.73-34	1.99-33	7.52-33	3.35-32	3.06-31
15	1.05-30	-3.87-38	-1.21-35	-4.62-35	-1.28-34	-2.77-34	-4.45-34	-5.35-34	-4.10-34	3.32-34	3.42-33	1.94-32	1.99-31	
14	1.31-30	-1.01-37	-1.58-35	-6.19-35	-1.79-34	-4.09-34	-7.16-34	-9.95-34	-1.07-33	-2.06-34	6.87-33	1.03-31		
13	1.65-30	-1.88-37	-2.10-35	-8.56-35	-2.61-34	-6.41-34	-1.26-33	-2.09-33	-3.22-33	-4.12-33	1.70-32			
12	2.13-30	-2.88-37	-2.88-35	-1.23-34	-4.01-34	-1.09-33	-2.48-33	-5.29-33	-1.30-32	-5.66-32				
11	2.83-30	-3.20-37	-4.04-35	-1.84-34	-6.59-34	-2.06-33	-5.87-33	-1.86-32	-1.13-31					
10	3.87-30	2.89-38	-5.77-35	-2.88-34	-1.18-33	-4.59-33	-1.91-32	-1.43-31						
9	5.51-30	1.83-36	-8.20-35	-4.72-34	-2.40-33	-1.35-32	-1.32-31							
8	8.27-30	8.26-36	-1.10-34	-8.04-34	-5.95-33	-7.89-32								
7	1.33-29	2.71-35	-1.30-34	-1.51-33	-2.62-32									
6	2.40-29	7.82-35	-1.26-34	-4.78-33										
5	5.13-29	2.58-34	1.47-34											
4	1.53-28	1.56-33												
3	1.11-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.28-35	6.83-35	8.68-35	1.09-34	1.36-34	1.69-34	2.08-34	2.56-34	3.14-34	3.84-34	4.71-34	5.77-34	7.08-34	8.71-34
45	7.83-35	1.02-34	1.32-34	1.68-34	2.13-34	2.69-34	3.38-34	4.25-34	5.33-34	6.70-34	8.44-34	1.07-33	1.36-33	1.74-33
40	1.24-34	1.66-34	2.18-34	2.85-34	3.70-34	4.79-34	6.22-34	8.07-34	1.05-33	1.38-33	1.83-33	2.45-33	3.32-33	4.58-33
35	2.20-34	3.02-34	4.11-34	5.57-34	7.54-34	1.03-33	1.41-33	1.95-33	2.74-33	3.92-33	5.75-33	8.73-33	1.38-32	2.31-32
30	4.63-34	6.71-34	9.72-34	1.42-33	2.09-33	3.16-33	4.90-33	7.90-33	1.35-32	2.47-32	5.10-32	1.26-31	4.35-31	3.33-30
29	5.55-34	8.17-34	1.21-33	1.80-33	2.74-33	4.28-33	6.95-33	1.19-32	2.20-32	4.54-32	1.13-31	3.91-31	3.00-30	
28	6.74-34	1.01-33	1.53-33	2.35-33	3.71-33	6.06-33	1.04-32	1.94-32	4.03-32	1.00-31	3.47-31	2.69-30		
27	8.35-34	1.28-33	2.00-33	3.18-33	5.24-33	9.08-33	1.70-32	3.54-32	8.86-32	3.08-31	2.11-30			
26	1.06-33	1.67-33	2.69-33	4.48-33	7.84-33	1.47-32	3.10-32	7.78-32	2.72-31	2.37-30				
25	1.37-33	2.25-33	3.79-33	6.69-33	1.27-32	2.68-32	6.78-32	2.38-31	1.86-30					
24	1.83-33	3.15-33	5.63-33	1.08-32	2.30-32	5.85-32	2.07-31	1.61-30						
23	2.56-33	4.66-33	9.05-33	1.95-32	5.00-32	1.78-31	1.40-30							
22	3.77-33	7.46-33	1.63-32	4.22-32	1.51-31	1.19-30								
21	6.00-33	1.33-32	3.51-32	1.27-31	1.02-30									
20	1.07-32	2.65-32	1.05-31	8.48-31										
19	2.25-32	8.45-32	6.93-31											
18	6.59-32	5.52-31												
17	4.23-31													

H TE = 1.25+04 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 2.144-13 4-2 RC = 2.482-14 4-2 EM = 1.014-25 2S RC = 7.152-14 2P RC = 1.429-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.51-04	1.74-04	7.74-05	4.14-05	2.48-05	1.60-05	1.10-05	7.87-06	5.83-06	4.44-06	3.47-06	2.76-06	2.23-06	1.83-06
45	7.10-04	2.26-04	1.02-04	5.52-05	3.34-05	2.18-05	1.50-05	1.08-05	8.06-06	6.16-06	4.82-06	3.84-06	3.11-06	2.55-06
40	9.49-04	3.06-04	1.40-04	7.69-05	4.70-05	3.10-05	2.15-05	1.55-05	1.16-05	8.91-06	6.98-06	5.57-06	4.52-06	3.71-06
35	1.34-03	4.37-04	2.04-04	1.14-04	7.01-05	4.64-05	3.24-05	2.35-05	1.76-05	1.35-05	1.06-05	8.46-06	6.86-06	5.64-06
30	2.04-03	6.75-04	3.20-04	1.80-04	1.12-04	7.42-05	5.19-05	3.77-05	2.83-05	2.17-05	1.70-05	1.36-05	1.10-05	9.06-06
29	2.24-03	7.45-04	3.54-04	1.99-04	1.24-04	8.23-05	5.75-05	4.18-05	3.13-05	2.41-05	1.89-05	1.51-05	1.22-05	1.00-05
28	2.48-03	8.25-04	3.93-04	2.21-04	1.37-04	9.15-05	6.40-05	4.65-05	3.49-05	2.68-05	2.10-05	1.68-05	1.36-05	1.12-05
27	2.75-03	9.17-04	4.38-04	2.47-04	1.53-04	1.02-04	7.15-05	5.20-05	3.90-05	2.99-05	2.35-05	1.88-05	1.52-05	1.25-05
26	3.06-03	1.03-03	4.90-04	2.76-04	1.72-04	1.15-04	8.02-05	5.83-05	4.37-05	3.36-05	2.63-05	2.10-05	1.70-05	1.40-05
25	3.43-03	1.15-03	5.51-04	3.11-04	1.94-04	1.29-04	9.03-05	6.56-05	4.92-05	3.78-05	2.97-05	2.37-05	1.92-05	1.57-05
24	3.87-03	1.30-03	6.22-04	3.51-04	2.19-04	1.46-04	1.02-04	7.43-05	5.57-05	4.28-05	3.35-05	2.68-05	2.17-05	1.78-05
23	4.38-03	1.47-03	7.07-04	3.99-04	2.49-04	1.66-04	1.16-04	8.45-05	6.33-05	4.87-05	3.81-05	3.04-05	2.46-05	2.01-05
22	4.99-03	1.68-03	8.07-04	4.56-04	2.85-04	1.90-04	1.33-04	9.66-05	7.24-05	5.56-05	4.36-05	3.48-05	2.81-05	2.30-05
21	5.73-03	1.93-03	9.28-04	5.25-04	3.27-04	2.18-04	1.53-04	1.11-04	8.34-05	6.40-05	5.02-05	3.99-05	3.23-05	2.63-05
20	6.63-03	2.24-03	1.07-03	6.08-04	3.79-04	2.53-04	1.77-04	1.29-04	9.66-05	7.42-05	5.81-05	4.62-05	3.72-05	3.03-05
19	7.72-03	2.61-03	1.25-03	7.09-04	4.43-04	2.95-04	2.07-04	1.51-04	1.13-04	8.65-05	6.77-05	5.38-05	4.32-05	3.50-05
18	9.08-03	3.06-03	1.47-03	8.34-04	5.21-04	3.48-04	2.44-04	1.77-04	1.33-04	1.02-04	7.95-05	6.30-05	5.04-05	4.05-05
17	1.08-02	3.64-03	1.75-03	9.91-04	6.19-04	4.13-04	2.90-04	2.11-04	1.58-04	1.21-04	9.41-05	7.43-05	5.89-05	4.64-05
16	1.29-02	4.36-03	2.10-03	1.19-03	7.44-04	4.97-04	3.48-04	2.53-04	1.89-04	1.45-04	1.12-04	8.79-05	6.84-05	5.03-05
15	1.57-02	5.29-03	2.55-03	1.45-03	9.04-04	6.04-04	4.23-04	3.08-04	2.30-04	1.75-04	1.35-04	1.03-04	7.51-05	
14	1.93-02	6.51-03	3.14-03	1.78-03	1.11-03	7.45-04	5.22-04	3.79-04	2.82-04	2.13-04	1.61-04	1.15-04		
13	2.41-02	8.14-03	3.93-03	2.23-03	1.40-03	9.33-04	6.53-04	4.72-04	3.49-04	2.59-04	1.83-04			
12	3.07-02	1.04-02	5.01-03	2.85-03	1.78-03	1.19-03	8.32-04	5.98-04	4.34-04	3.01-04				
11	4.00-02	1.35-02	6.52-03	3.71-03	2.33-03	1.55-03	1.08-03	7.63-04	5.18-04					
10	5.34-02	1.80-02	8.72-03	4.97-03	3.11-03	2.07-03	1.42-03	9.40-04						
9	7.37-02	2.49-02	1.21-02	6.88-03	4.30-03	2.82-03	1.82-03							
8	1.06-01	3.57-02	1.73-02	9.89-03	6.13-03	3.80-03								
7	1.60-01	5.40-02	2.63-02	1.49-02	8.78-03									
6	2.61-01	8.77-02	4.26-02	2.32-02										
5	4.71-01	1.57-01	7.38-02											
4	1.00+00	3.19-01												
3	2.82+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.52-06	1.27-06	1.08-06	9.21-07	7.93-07	6.88-07	6.01-07	5.27-07	4.65-07	4.13-07	3.68-07	3.29-07	2.95-07	2.66-07
45	2.12-06	1.78-06	1.51-06	1.29-06	1.11-06	9.66-07	8.44-07	7.41-07	6.54-07	5.80-07	5.16-07	4.62-07	4.14-07	3.73-07
40	3.09-06	2.59-06	2.20-06	1.88-06	1.62-06	1.41-06	1.23-06	1.08-06	9.49-07	8.41-07	7.48-07	6.68-07	5.99-07	5.38-07
35	4.69-06	3.94-06	3.34-06	2.85-06	2.46-06	2.13-06	1.85-06	1.62-06	1.43-06	1.26-06	1.12-06	9.96-07	8.88-07	7.93-07
30	7.53-06	6.32-06	5.35-06	4.56-06	3.91-06	3.38-06	2.94-06	2.56-06	2.24-06	1.96-06	1.72-06	1.50-06	1.28-06	1.04-06
29	8.34-06	7.00-06	5.92-06	5.04-06	4.33-06	3.73-06	3.24-06	2.82-06	2.45-06	2.14-06	1.86-06	1.59-06	1.28-06	
28	9.27-06	7.77-06	6.57-06	5.60-06	4.80-06	4.13-06	3.58-06	3.10-06	2.69-06	2.32-06	1.98-06	1.59-06		
27	1.03-05	8.67-06	7.32-06	6.23-06	5.33-06	4.58-06	3.95-06	3.41-06	2.93-06	2.49-06	1.98-06			
26	1.16-05	9.70-06	8.18-06	6.95-06	5.94-06	5.09-06	4.37-06	3.74-06	3.15-06	2.50-06				
25	1.30-05	1.09-05	9.18-06	7.78-06	6.63-06	5.65-06	4.81-06	4.03-06	3.19-06					
24	1.47-05	1.23-05	1.03-05	8.73-06	7.40-06	6.25-06	5.22-06	4.10-06						
23	1.67-05	1.39-05	1.16-05	9.80-06	8.23-06	6.82-06	5.33-06							
22	1.90-05	1.58-05	1.32-05	1.10-05	9.03-06	7.01-06								
21	2.17-05	1.79-05	1.48-05	1.21-05	9.34-06									
20	2.48-05	2.04-05	1.65-05	1.26-05										
19	2.84-05	2.29-05	1.73-05											
18	3.22-05	2.42-05												
17	3.45-05													

H TE = 1.25+04 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.18-37	1.19-37	1.41-37	1.84-37	2.89-37	5.31-37	1.03-36	1.98-36	3.64-36	6.36-36	1.06-35	1.71-35	2.65-35
45	0.00+00	1.60-37	1.81-37	2.43-37	3.56-37	5.73-37	9.86-37	1.74-36	3.05-36	5.20-36	8.60-36	1.38-35	2.16-35	3.28-35
40	0.00+00	2.30-37	2.77-37	4.00-37	6.18-37	9.93-37	1.63-36	2.68-36	4.36-36	6.99-36	1.10-35	1.69-35	2.55-35	3.79-35
35	0.00+00	3.42-37	4.25-37	6.39-37	1.01-36	1.59-36	2.50-36	3.89-36	5.95-36	8.98-36	1.34-35	1.96-35	2.84-35	4.09-35
30	0.00+00	5.39-37	6.76-37	1.03-36	1.63-36	2.54-36	3.87-36	5.76-36	8.39-36	1.20-35	1.68-35	2.32-35	3.17-35	4.26-35
29	0.00+00	5.96-37	7.48-37	1.15-36	1.81-36	2.81-36	4.27-36	6.32-36	9.14-36	1.29-35	1.80-35	2.45-35	3.28-35	4.31-35
28	0.00+00	6.61-37	8.31-37	1.27-36	2.01-36	3.13-36	4.74-36	7.00-36	1.01-35	1.41-35	1.94-35	2.61-35	3.42-35	4.36 35
27	0.00+00	7.37-37	9.27-37	1.43-36	2.25-36	3.51-36	5.31-36	7.82-36	1.12-35	1.56-35	2.12-35	2.81-35	3.59-35	4.39-35
26	0.00+00	8.26-37	1.04-36	1.60-36	2.54-36	3.96-36	6.00-36	8.82-36	1.26-35	1.75-35	2.36-35	3.07-35	3.81-35	4.39-35
25	0.00+00	9.30-37	1.17-36	1.81-36	2.88-36	4.51-36	6.85-36	1.01-35	1.44-35	1.99-35	2.67-35	3.41-35	4.08-35	4.29-35
24	0.00+00	1.05-36	1.33-36	2.07-36	3.30-36	5.18-36	7.90-36	1.17-35	1.67-35	2.31-35	3.07-35	3.85-35	4.38-35	3.93-35
23	0.00+00	1.20-36	1.52-36	2.37-36	3.81-36	6.01-36	9.22-36	1.37-35	1.97-35	2.72-35	3.60-35	4.41-35	4.67-35	2.98-35
22	0.00+00	1.37-36	1.75-36	2.74-36	4.43-36	7.06-36	1.09-35	1.63-35	2.36-35	3.28-35	4.31-35	5.13-35	4.80-35	5.93-36
21	0.00+00	1.59-36	2.03-36	3.20-36	5.22-36	8.39-36	1.31-35	1.98-35	2.89-35	4.03-35	5.27-35	6.01-35	4.39-35	-5.48-35
20	0.00+00	1.85-36	2.37-36	3.77-36	6.22-36	1.01-35	1.60-35	2.45-35	3.61-35	5.08-35	6.58-35	6.96-35	2.21-35	-2.19-34
19	0.00+00	2.17-36	2.80-36	4.50-36	7.50-36	1.24-35	1.99-35	3.09-35	4.63-35	6.57-35	8.36-35	7.54-35	-5.63-35	-7.21-34
18	0.00+00	2.57-36	3.34-36	5.43-36	9.19-36	1.54-35	2.52-35	4.00-35	6.11-35	8.75-35	1.07-34	5.95-35	-3.37-34	-2.62-33
17	0.00+00	3.08-36	4.04-36	6.66-36	1.15-35	1.96-35	3.28-35	5.34-35	8.35-35	1.20-34	1.32-34	-5.70-35	-1.52-33	-1.32-32
16	0.00+00	3.74-36	4.96-36	8.30-36	1.46-35	2.56-35	4.40-35	7.40-35	1.19-34	1.69-34	1.30-34	-6.92-34	-8.71-33	-1.58-31
15	0.00+00	4.60-36	6.18-36	1.05-35	1.90-35	3.44-35	6.15-35	1.07-34	1.78-34	2.37-34	-1.08-34	-5.16-33	-1.15-31	
14	0.00+00	5.76-36	7.86-36	1.37-35	2.56-35	4.81-35	9.02-35	1.66-34	2.81-34	2.63-34	-2.50-33	-7.88-32		
13	0.00+00	7.35-36	1.02-35	1.84-35	3.58-35	7.09-35	1.42-34	2.77-34	4.58-34	-6.47-34	-4.95-32			
12	0.00+00	9.61-36	1.37-35	2.57-35	5.26-35	1.12-34	2.44-34	5.18-34	4.96-34	-2.70-32				
11	0.00+00	1.29-35	1.90-35	3.76-35	8.31-35	1.96-34	4.86-34	1.07-33	-1.11-32					
10	0.00+00	1.80-35	2.78-35	5.91-35	1.46-34	4.02-34	1.22-33	-1.07-33						
9	0.00+00	2.64-35	4.32-35	1.03-34	3.01-34	1.09-33	4.02-33							
8	0.00+00	4.12-35	7.41-35	2.10-34	8.44-34	5.53-33								
7	0.00+00	7.07-35	1.48-34	5.82-34	4.89-33									
6	0.00+00	1.41-34	3.95-34	3.43-33										
5	0.00+00	3.67-34	2.14-33											
4	0.00+00	1.83-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.01-35	5.92-35	8.57-35	1.22-34	1.71-34	2.37-34	3.25-34	4.43-34	5.98-34	8.04-34	1.08-33	1.43-33	1.91-33	2.54-33
45	4.89-35	7.14-35	1.03-34	1.46-34	2.05-34	2.86-34	3.95-34	5.43-34	7.43-34	1.01-33	1.38-33	1.89-33	2.58-33	3.54-33
40	5.55-35	8.02-35	1.15-34	1.63-34	2.29-34	3.22-34	4.50-34	6.28-34	8.77-34	1.23-33	1.73-33	2.45-33	3.50-33	5.07-33
35	5.83-35	8.26-35	1.17-34	1.64-34	2.31-34	3.26-34	4.61-34	6.56-34	9.41-34	1.37-33	2.02-33	3.04-33	4.72-33	7.67-33
30	5.66-35	7.42-35	9.56-35	1.20-34	1.46-34	1.63-34	1.51-34	4.99-35	-3.02-34	-1.39-33	-4.83-33	-1.74-32	-7.99-32	-7.45-31
29	5.54-35	6.92-35	8.28-35	9.15-35	8.36-35	3.10-35	-1.37-34	-6.06-34	-1.91-33	-5.84-33	-1.98-32	-8.83-32	-8.27-31	
28	5.34-35	6.13-35	6.20-35	4.27-35	-2.69-35	-2.20-34	-7.29-34	-2.10-33	-6.15-33	-2.04-32	-9.02-32	-8.53-31		
27	4.98-35	4.81-35	2.65-35	-4.43-35	-2.35-34	-7.31-34	-2.06-33	-5.98-33	-1.97-32	-8.78-32	-8.41-31			
26	4.33-35	2.51-35	-3.70-35	-2.08-34	-6.57-34	-1.87-33	-5.48-33	-1.83-32	-8.23-32	-8.03-31				
25	3.11-35	-1.71-35	-1.58-34	-5.40-34	-1.60-33	-4.80-33	-1.63-32	-7.49-32	-7.46-31					
24	7.02-36	-9.97-35	-4.07-34	-1.29-33	-4.03-33	-1.41-32	-6.64-32	-6.80-31						
23	-4.31-35	-2.75-34	-9.77-34	-3.24-33	-1.18-32	-5.75-32	-6.08-31							
22	-1.55-34	-6.85-34	-2.49-33	-9.60-33	-4.86-32	-5.34-31								
21	-4.30-34	-1.80-33	-7.51-33	-4.01-32	-4.61-31									
20	-1.21-33	-5.62-33	-3.22-32	-3.90-31										
19	-3.98-33	-2.50-32	-3.24-31											
18	-1.86-32	-2.63-31												
17	-2.07-31													

H TE = 1.25+04 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 2.145-13 4-2 RC = 2.485-14 4-2 EM = 1.015-25 2S RC = 7.162-14 2P RC = 1.429-13

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.46-04	1.99-04	8.62-05	4.49-05	2.64-05	1.68-05	1.13-05	8.02-06	5.88-06	4.44-06	3.44-06	2.71-06	2.18-06	1.78-06
45	8.45-04	2.62-04	1.14-04	5.97-05	3.52-05	2.25-05	1.52-05	1.08-05	7.94-06	6.01-06	4.66-06	3.68-06	2.96-06	2.42-06
40	1.13-03	3.54-04	1.56-04	8.22-05	4.88-05	3.13-05	2.14-05	1.52-05	1.12-05	8.52-06	6.62-06	5.25-06	4.23-06	3.46-06
35	1.56-03	4.95-04	2.21-04	1.18-04	7.10-05	4.61-05	3.16-05	2.27-05	1.68-05	1.28-05	1.00-05	7.95-06	6.42-06	5.27-06
30	2.28-03	7.31-04	3.34-04	1.82-04	1.11-04	7.28-05	5.04-05	3.64-05	2.71-05	2.08-05	1.62-05	1.29-05	1.05-05	8.59-06
29	2.48-03	7.99-04	3.66-04	2.01-04	1.23-04	8.06-05	5.59-05	4.04-05	3.01-05	2.31-05	1.81-05	1.44-05	1.17-05	9.57-06
28	2.72-03	8.76-04	4.04-04	2.22-04	1.36-04	8.96-05	6.23-05	4.50-05	3.36-05	2.58-05	2.02-05	1.61-05	1.30-05	1.07-05
27	2.99-03	9.66-04	4.47-04	2.47-04	1.52-04	1.00-04	6.97-05	5.04-05	3.77-05	2.89-05	2.26-05	1.80-05	1.46-05	1.20-05
26	3.30-03	1.07-03	4.98-04	2.76-04	1.70-04	1.12-04	7.82-05	5.67-05	4.24-05	3.25-05	2.54-05	2.03-05	1.64-05	1.35-05
25	3.66-03	1.19-03	5.57-04	3.10-04	1.91-04	1.27-04	8.83-05	6.40-05	4.79-05	3.67-05	2.87-05	2.29-05	1.85-05	1.52-05
24	4.08-03	1.34-03	6.27-04	3.50-04	2.16-04	1.44-04	1.00-04	7.26-05	5.43-05	4.17-05	3.26-05	2.60-05	2.10-05	1.72-05
23	4.58-03	1.51-03	7.10-04	3.97-04	2.46-04	1.63-04	1.14-04	8.28-05	6.19-05	4.75-05	3.72-05	2.96-05	2.39-05	1.96-05
22	5.18-03	1.71-03	8.10-04	4.54-04	2.82-04	1.87-04	1.31-04	9.49-05	7.10-05	5.44-05	4.26-05	3.39-05	2.74-05	2.23-05
21	5.90-03	1.96-03	9.30-04	5.22-04	3.25-04	2.16-04	1.51-04	1.09-04	8.19-05	6.28-05	4.91-05	3.90-05	3.14-05	2.56-05
20	6.77-03	2.26-03	1.07-03	6.05-04	3.76-04	2.50-04	1.75-04	1.27-04	9.50-05	7.28-05	5.69-05	4.52-05	3.63-05	2.95-05
19	7.85-03	2.62-03	1.25-03	7.06-04	4.40-04	2.93-04	2.05-04	1.49-04	1.11-04	8.50-05	6.63-05	5.26-05	4.22-05	3.41-05
18	9.18-03	3.08-03	1.47-03	8.32-04	5.18-04	3.45-04	2.41-04	1.75-04	1.31-04	1.00-04	7.79-05	6.16-05	4.92-05	3.95-05
17	1.09-02	3.65-03	1.75-03	9.88-04	6.16-04	4.10-04	2.87-04	2.02-04	1.55-04	1.19-04	9.22-05	7.26-05	5.75-05	4.52-05
16	1.30-02	4.37-03	2.10-03	1.19-03	7.40-04	4.93-04	3.45-04	2.50-04	1.86-04	1.42-04	1.10-04	8.58-05	6.66-05	4.91-05
15	1.57-02	5.30-03	2.55-03	1.44-03	9.00-04	6.00-04	4.19-04	3.04-04	2.26-04	1.71-04	1.32-04	1.01-04	7.33-05	
14	1.93-02	6.52-03	3.14-03	1.78-03	1.11-03	7.39-04	5.17-04	3.74-04	2.77-04	2.09-04	1.57-04	1.13-04		
13	2.42-02	8.15-03	3.92-03	2.22-03	1.39-03	9.26-04	6.46-04	4.66-04	3.43-04	2.53-04	1.79-04			
12	3.07-02	1.04-02	5.00-03	2.84-03	1.77-03	1.18-03	8.22-04	5.88-04	4.25-04	2.94-04				
11	4.00-02	1.35-02	6.51-03	3.70-03	2.31-03	1.54-03	1.06-03	7.48-04	5.07-04					
10	5.34-02	1.80-02	8.71-03	4.95-03	3.09-03	2.05-03	1.39-03	9.20-04						
9	7.37-02	2.49-02	1.20-02	6.84-03	4.26-03	2.78-03	1.78-03							
8	1.06-01	3.57-02	1.73-02	9.84-03	6.06-03	3.73-03								
7	1.60-01	5.40-02	2.62-02	1.48-02	8.64-03									
6	2.61-01	8.76-02	4.24-02	2.29-02										
5	4.71-01	1.57-01	7.31-02											
4	1.00+00	3.17-01												
3	2.81+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.47-06	1.23-06	1.04-06	8.83-07	7.59-07	6.56-07	5.71-07	5.01-07	4.41-07	3.91-07	3.47-07	3.10-07	2.79-07	2.51-07
45	2.00-06	1.67-06	1.41-06	1.20-06	1.04-06	8.96-07	7.81-07	6.84-07	6.03-07	5.34-07	4.75-07	4.24-07	3.81-07	3.43-07
40	2.87-06	2.40-06	2.03-06	1.73-06	1.49-06	1.29-06	1.13-06	9.86-07	8.69-07	7.70-07	6.85-07	6.12-07	5.48-07	4.93-07
35	4.37-06	3.66-06	3.10-06	2.65-06	2.28-06	1.97-06	1.72-06	1.51-06	1.33-06	1.17-06	1.04-06	9.29-07	8.30-07	7.43-07
30	7.13-06	5.98-06	5.06-06	4.32-06	3.71-06	3.21-06	2.79-06	2.43-06	2.13-06	1.87-06	1.64-06	1.44-06	1.24-06	1.01-06
29	7.94-06	6.66-06	5.63-06	4.80-06	4.12-06	3.56-06	3.09-06	2.69-06	2.35-06	2.05-06	1.79-06	1.53-06	1.24-06	
28	8.86-06	7.43-06	6.28-06	5.35-06	4.59-06	3.96-06	3.43-06	2.98-06	2.59-06	2.24-06	1.92-06	1.54-06		
27	9.93-06	8.31-06	7.02-06	5.98-06	5.12-06	4.40-06	3.80-06	3.29-06	2.83-06	2.41-06	1.93-06			
26	1.12-05	9.33-06	7.88-06	6.69-06	5.72-06	4.91-06	4.22-06	3.61-06	3.06-06	2.44-06				
25	1.26-05	1.05-05	8.86-06	7.51-06	6.40-06	5.46-06	4.65-06	3.92-06	3.11-06					
24	1.42-05	1.19-05	9.99-06	8.44-06	7.16-06	6.06-06	5.07-06	4.00-06						
23	1.62-05	1.35-05	1.13-05	9.49-06	7.98-06	6.63-06	5.20-06							
22	1.84-05	1.53-05	1.28-05	1.06-05	8.78-06	6.84-06								
21	2.11-05	1.74-05	1.44-05	1.18-05	9.12-06									
20	2.42-05	1.98-05	1.61-05	1.23-05										
19	2.77-05	2.23-05	1.69-05											
18	3.14-05	2.37-05												
17	3.37-05													

H TE = 1.25+04 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.04-37	7.90-38	2.75-38	-6.68-38	-1.84-37	-2.60-37	-1.74-37	2.70-37	1.37-36	3.54-36	7.37-36	1.36-35	2.33-35
45	0.00+00	1.48-37	1.27-37	9.01-38	2.87-38	-1.15-38	8.14-38	5.08-37	1.59-36	3.80-36	7.83-36	1.46-35	2.55-35	4.23-35
40	0.00+00	2.18-37	2.12-37	2.15-37	2.32-37	3.45-37	7.31-37	1.70-36	3.72-36	7.56-36	1.42-35	2.53-35	4.28-35	6.99-35
35	0.00+00	3.39-37	3.71-37	4.71-37	6.66-37	1.09-36	2.02-36	3.87-36	7.36-36	1.35-35	2.39-35	4.08-35	6.76-35	1.09-34
30	0.00+00	5.53-37	6.65-37	9.62-37	1.51-36	2.50-36	4.30-36	7.47-36	1.29-35	2.21-35	3.70-35	6.10-35	9.91-35	1.59-34
29	0.00+00	6.14-37	7.48-37	1.10-36	1.74-36	2.89-36	4.90-36	8.40-36	1.43-35	2.41-35	3.99-35	6.54-35	1.06-34	1.70-34
28	0.00+00	6.83-37	8.42-37	1.26-36	2.01-36	3.32-36	5.57-36	9.39-36	1.57-35	2.61-35	4.29-35	6.97-35	1.12-34	1.80-34
27	0.00+00	7.63-37	9.49-37	1.44-36	2.31-36	3.80-36	6.31-36	1.05-35	1.73-35	2.83-35	4.60-35	7.42-35	1.19-34	1.91-34
26	0.00+00	8.54-37	1.07-36	1.64-36	2.64-36	4.33-36	7.13-36	1.17-35	1.90-35	3.07-35	4.93-35	7.87-35	1.26-34	2.01-34
25	0.00+00	9.60-37	1.21-36	1.87-36	3.03-36	4.95-36	8.06-36	1.30-35	2.09-35	3.33-35	5.28-35	8.35-35	1.32-34	2.11-34
24	0.00+00	1.08-36	1.38-36	2.14-36	3.47-36	5.65-36	9.14-36	1.46-35	2.31-35	3.63-35	5.67-35	8.86-35	1.39-34	2.19-34
23	0.00+00	1.23-36	1.57-36	2.45-36	3.99-36	6.48-36	1.04-35	1.65-35	2.57-35	3.98-35	6.13-35	9.43-35	1.45-34	2.25-34
22	0.00+00	1.41-36	1.80-36	2.83-36	4.61-36	7.49-36	1.20-35	1.88-35	2.90-35	4.43-35	6.69-35	1.01-34	1.50-34	2.22-34
21	0.00+00	1.62-36	2.08-36	3.28-36	5.37-36	8.73-36	1.39-35	2.17-35	3.33-35	5.01-35	7.41-35	1.07-34	1.51-34	1.96-34
20	0.00+00	1.88-36	2.42-36	3.84-36	6.33-36	1.03-35	1.65-35	2.57-35	3.91-35	5.79-35	8.33-35	1.14-34	1.37-34	1.03-34
19	0.00+00	2.20-36	2.84-36	4.55-36	7.55-36	1.24-35	1.99-35	3.11-35	4.71-35	6.89-35	9.51-35	1.15-34	7.99-35	-2.15-34
18	0.00+00	2.59-36	3.38-36	5.46-36	9.15-36	1.52-35	2.46-35	3.87-35	5.88-35	8.46-35	1.09-34	9.34-35	-1.32-34	-1.45-33
17	0.00+00	3.10-36	4.07-36	6.65-36	1.13-35	1.90-35	3.13-35	4.99-35	7.62-35	1.07-34	1.18-34	-1.77-35	-1.00-33	-8.09-33
16	0.00+00	3.76-36	4.97-36	8.24-36	1.43-35	2.45-35	4.13-35	6.72-35	1.03-34	1.39-34	9.10-35	-5.51-34	-5.94-33	-9.01-32
15	0.00+00	4.62-36	6.18-36	1.04-35	1.85-35	3.27-35	5.67-35	9.49-35	1.47-34	1.73-34	-1.60-34	-3.91-33	-7.07-32	
14	0.00+00	5.77-36	7.84-36	1.35-35	2.48-35	4.54-35	8.09-35	1.42-34	2.19-34	1.35-34	-2.16-33	-5.22-32		
13	0.00+00	7.36-36	1.02-35	1.81-35	3.45-35	6.63-35	1.27-34	2.31-34	3.23-34	-7.89-34	-3.55-32			
12	0.00+00	9.62-36	1.36-35	2.52-35	5.05-35	1.04-34	2.14-34	4.11-34	1.79-34	-2.13-32				
11	0.00+00	1.29-35	1.89-35	3.69-35	7.95-35	1.80-34	4.15-34	7.52-34	-1.01-32					
10	0.00+00	1.80-35	2.76-35	5.78-35	1.38-34	3.63-34	9.82-34	-2.20-33						
9	0.00+00	2.64-35	4.30-35	1.00-34	2.83-34	9.57-34	2.52-33							
8	0.00+00	4.12-35	7.36-35	2.04-34	7.80-34	4.44-33								
7	0.00+00	7.07-35	1.47-34	5.60-34	4.34-33									
6	0.00+00	1.41-34	3.90-34	3.23-33										
5	0.00+00	3.67-34	2.09-33											
4	0.00+00	1.83-33												
3	0.00+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.79-35	5.90-35	8.89-35	1.31-34	1.88-34	2.65-34	3.68-34	5.05-34	6.85-34	9.20-34	1.23-33	1.62-33	2.13-33	2.78-33
45	6.74-35	1.04-34	1.57-34	2.31-34	3.34-34	4.78-34	6.75-34	9.44-34	1.31-33	1.81-33	2.49-33	3.42-33	4.68-33	6.41-33
40	1.11-34	1.71-34	2.59-34	3.86-34	5.69-34	8.30-34	1.20-33	1.74-33	2.50-33	3.61-33	5.22-33	7.58-33	1.11-32	1.65-32
35	1.73-34	2.69-34	4.13-34	6.29-34	9.52-34	1.44-33	2.18-33	3.32-33	5.10-33	7.95-33	1.26-32	2.07-32	3.50-32	6.25-32
30	2.53-34	4.01-34	6.34-34	1.01-33	1.61-33	2.62-33	4.36-33	7.48-33	1.35-32	2.60-32	5.56-32	1.41-31	4.97-31	3.86-30
29	2.71-34	4.31-34	6.89-34	1.11-33	1.81-33	3.01-33	5.16-33	9.27-33	1.78-32	3.79-32	9.58-32	3.33-31	2.56-30	
28	2.88-34	4.62-34	7.46-34	1.22-33	2.03-33	3.48-33	6.23-33	1.19-32	2.51-32	6.27-32	2.15-31	1.63-30		
27	3.06-34	4.94-34	8.06-34	1.34-33	2.29-33	4.08-33	7.72-33	1.61-32	3.94-32	1.32-31	9.77-31			
26	3.23-34	5.25-34	8.68-34	1.47-33	2.59-33	4.84-33	9.86-33	2.34-32	7.53-32	5.35-31				
25	3.39-34	5.54-34	9.25-34	1.60-33	2.91-33	5.72-33	1.29-32	3.82-32	2.46-31					
24	3.51-34	5.71-34	9.55-34	1.66-33	3.04-33	6.12-33	1.47-32	6.34-32						
23	3.52-34	5.55-34	8.84-34	1.39-33	1.98-33	4.89-34	-4.61-32							
22	3.21-34	4.36-34	4.49-34	-3.63-34	-7.49-33	-1.07-31								
21	2.02-34	-2.82-35	-1.50-33	-1.13-32	-1.36-31									
20	-2.09-34	-1.88-33	-1.23-32	-1.45-31										
19	-1.79-33	-1.17-32	-1.39-31											
18	-1.01-32	-1.27-31												
17	-1.09-31													

H TE = 1.25+04 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 2.149-13 4-2 RC = 2.489-14 4-2 EM = 1.017-25 2S RC = 7.180-14 2P RC = 1.430-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.46-04	2.29-04	9.85-05	5.11-05	2.98-05	1.89-05	1.27-05	8.98-06	6.57-06	4.95-06	3.82-06	3.01-06	2.42-06	1.97-06
45	9.67-04	2.97-04	1.28-04	6.64-05	3.88-05	2.46-05	1.66-05	1.17-05	8.56-06	6.45-06	4.98-06	3.93-06	3.15-06	2.57-06
40	1.30-03	3.99-04	1.72-04	8.95-05	5.24-05	3.33-05	2.24-05	1.58-05	1.16-05	8.75-06	6.76-06	5.33-06	4.28-06	3.48-06
35	1.83-03	5.64-04	2.44-04	1.28-04	7.48-05	4.77-05	3.22-05	2.28-05	1.67-05	1.26-05	9.77-06	7.72-06	6.20-06	5.05-06
30	2.70-03	8.42-04	3.68-04	1.94-04	1.15-04	7.34-05	4.99-05	3.55-05	2.61-05	1.98-05	1.54-05	1.22-05	9.78-06	7.99-06
29	2.94-03	9.18-04	4.03-04	2.13-04	1.26-04	8.09-05	5.51-05	3.92-05	2.89-05	2.19-05	1.70-05	1.35-05	1.08-05	8.86-06
28	3.20-03	1.00-03	4.42-04	2.34-04	1.39-04	8.94-05	6.10-05	4.35-05	3.21-05	2.44-05	1.89-05	1.50-05	1.21-05	9.88-06
27	3.50-03	1.10-03	4.86-04	2.58-04	1.54-04	9.93-05	6.79-05	4.85-05	3.58-05	2.72-05	2.12-05	1.68-05	1.35-05	1.11-05
26	3.83-03	1.21-03	5.37-04	2.87-04	1.71-04	1.11-04	7.59-05	5.43-05	4.02-05	3.06-05	2.38-05	1.89-05	1.52-05	1.24-05
25	4.22-03	1.33-03	5.96-04	3.19-04	1.92-04	1.24-04	8.53-05	6.11-05	4.53-05	3.45-05	2.69-05	2.13-05	1.72-05	1.41-05
24	4.66-03	1.48-03	6.64-04	3.58-04	2.16-04	1.40-04	9.65-05	6.93-05	5.14-05	3.92-05	3.06-05	2.43-05	1.96-05	1.60-05
23	5.18-03	1.65-03	7.45-04	4.03-04	2.44-04	1.59-04	1.10-04	7.90-05	5.87-05	4.48-05	3.49-05	2.77-05	2.24-05	1.83-05
22	5.79-03	1.85-03	8.41-04	4.58-04	2.78-04	1.82-04	1.26-04	9.06-05	6.74-05	5.15-05	4.02-05	3.19-05	2.57-05	2.10-05
21	6.52-03	2.09-03	9.57-04	5.24-04	3.19-04	2.10-04	1.45-04	1.05-04	7.80-05	5.96-05	4.65-05	3.69-05	2.97-05	2.42-05
20	7.39-03	2.38-03	1.10-03	6.04-04	3.70-04	2.43-04	1.69-04	1.22-04	9.08-05	6.94-05	5.41-05	4.29-05	3.45-05	2.81-05
19	8.46-03	2.74-03	1.27-03	7.02-04	4.32-04	2.85-04	1.98-04	1.43-04	1.07-04	8.14-05	6.34-05	5.02-05	4.03-05	3.26-05
18	9.77-03	3.18-03	1.48-03	8.25-04	5.09-04	3.36-04	2.34-04	1.69-04	1.26-04	9.62-05	7.48-05	5.91-05	4.72-05	3.78-05
17	1.14-02	3.73-03	1.75-03	9.80-04	6.06-04	4.01-04	2.79-04	2.02-04	1.50-04	1.14-04	8.88-05	6.98-05	5.52-05	4.35-05
16	1.35-02	4.44-03	2.10-03	1.18-03	7.29-04	4.83-04	3.36-04	2.43-04	1.81-04	1.37-04	1.06-04	8.27-05	6.42-05	4.74-05
15	1.62-02	5.35-03	2.55-03	1.43-03	8.88-04	5.89-04	4.10-04	2.96-04	2.19-04	1.66-04	1.27-04	9.72-05	7.08-05	
14	1.97-02	6.56-03	3.13-03	1.76-03	1.10-03	7.27-04	5.06-04	3.64-04	2.69-04	2.02-04	1.52-04	1.09-04		
13	2.44-02	8.18-03	3.91-03	2.21-03	1.37-03	9.11-04	6.33-04	4.54-04	3.33-04	2.45-04	1.73-04			
12	3.10-02	1.04-02	4.99-03	2.82-03	1.75-03	1.16-03	8.05-04	5.73-04	4.12-04	2.85-04				
11	4.02-02	1.35-02	6.49-03	3.67-03	2.29-03	1.51-03	1.04-03	7.28-04	4.91-04					
10	5.36-02	1.80-02	8.68-03	4.92-03	3.05-03	2.01-03	1.36-03	8.92-04						
9	7.39-02	2.48-02	1.20-02	6.79-03	4.20-03	2.72-03	1.73-03							
8	1.06-01	3.57-02	1.72-02	9.74-03	5.95-03	3.63-03								
7	1.61-01	5.39-02	2.61-02	1.46-02	8.43-03									
6	2.61-01	8.75-02	4.20-02	2.24-02										
5	4.72-01	1.56-01	7.20-02											
4	1.00+00	3.14-01												
3	2.81+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.62-06	1.35-06	1.14-06	9.72-07	8.34-07	7.21-07	6.27-07	5.49-07	4.83-07	4.28-07	3.80-07	3.39-07	3.04-07	2.74-07
45	2.12-06	1.77-06	1.49-06	1.27-06	1.09-06	9.40-07	8.18-07	7.16-07	6.30-07	5.56-07	4.96-07	4.43-07	3.97-07	3.57-07
40	2.88-06	2.40-06	2.03-06	1.72-06	1.48-06	1.28-06	1.11-06	9.73-07	8.56-07	7.58-07	6.73-07	6.00-07	5.38-07	4.83-07
35	4.17-06	3.49-06	2.94-06	2.50-06	2.15-06	1.86-06	1.61-06	1.41-06	1.24-06	1.10-06	9.74-07	8.67-07	7.74-07	6.93-07
30	6.61-06	5.52-06	4.66-06	3.97-06	3.41-06	2.94-06	2.56-06	2.23-06	1.95-06	1.72-06	1.51-06	1.32-06	1.14-06	9.33-07
29	7.33-06	6.13-06	5.18-06	4.41-06	3.78-06	3.26-06	2.83-06	2.47-06	2.16-06	1.89-06	1.65-06	1.42-06	1.15-06	
28	8.17-06	6.84-06	5.77-06	4.91-06	4.21-06	3.63-06	3.15-06	2.74-06	2.38-06	2.07-06	1.78-06	1.44-06		
27	9.15-06	7.66-06	6.46-06	5.50-06	4.71-06	4.06-06	3.51-06	3.04-06	2.63-06	2.24-06	1.81-06			
26	1.03-05	8.61-06	7.27-06	6.18-06	5.29-06	4.54-06	3.91-06	3.36-06	2.86-06	2.29-06				
25	1.17-05	9.74-06	8.21-06	6.97-06	5.95-06	5.09-06	4.35-06	3.68-06	2.93-06					
24	1.32-05	1.11-05	9.31-06	7.88-06	6.70-06	5.69-06	4.78-06	3.79-06						
23	1.51-05	1.26-05	1.06-05	8.92-06	7.52-06	6.28-06	4.95-06							
22	1.73-05	1.44-05	1.20-05	1.01-05	8.34-06	6.54-06								
21	1.99-05	1.65-05	1.37-05	1.12-05	8.74-06									
20	2.30-05	1.89-05	1.54-05	1.18-05										
19	2.65-05	2.13-05	1.63-05											
18	3.02-05	2.28-05												
17	3.25-05													

H TE = 1.25+04 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	9.31-38	3.02-38	-1.24-37	-4.48-37	-1.02-36	-1.92-36	-3.24-36	-5.07-36	-7.55-36	-1.08-35	-1.51-35	-2.08-35	-2.84-35
45	0.00+00	1.34-37	6.88-38	-8.68-38	-4.07-37	-9.47-37	-1.74-36	-2.80-36	-4.10-36	-5.60-36	-7.23-36	-8.90-36	-1.05-35	-1.22-35
40	0.00+00	2.01-37	1.37-37	-6.27-39	-2.89-37	-7.17-37	-1.23-36	-1.68-36	-1.79-36	-1.15-36	8.65-37	5.09-36	1.27-35	2.50-35
35	0.00+00	3.14-37	2.58-37	1.46-37	-5.95-38	-2.82-37	-3.02-37	3.08-37	2.27-36	6.73-36	1.54-35	3.08-35	5.65-35	9.78-35
30	0.00+00	5.23-37	5.06-37	4.99-37	5.13-37	7.64-37	1.75-36	4.39-36	1.03-35	2.20-35	4.35-35	8.15-35	1.46-34	2.53-34
29	0.00+00	5.86-37	5.85-37	6.21-37	7.21-37	1.14-36	2.47-36	5.75-36	1.28-35	2.67-35	5.23-35	9.74-35	1.74-34	3.04-34
28	0.00+00	6.59-37	6.79-37	7.71-37	9.80-37	1.61-36	3.34-36	7.39-36	1.59-35	3.24-35	6.27-35	1.16-34	2.09-34	3.65-34
27	0.00+00	7.44-37	7.92-37	9.54-37	1.30-36	2.19-36	4.40-36	9.34-36	1.95-35	3.90-35	7.48-35	1.38-34	2.49-34	4.40-34
26	0.00+00	8.42-37	9.25-37	1.18-36	1.69-36	2.89-36	5.67-36	1.17-35	2.37-35	4.68-35	8.90-35	1.65-34	2.98-34	5.31-34
25	0.00+00	9.58-37	1.08-36	1.44-36	2.16-36	3.74-36	7.20-36	1.44-35	2.87-35	5.58-35	1.06-34	1.96-34	3.56-34	6.43-34
24	0.00+00	1.09-36	1.27-36	1.77-36	2.74-36	4.76-36	9.01-36	1.76-35	3.44-35	6.62-35	1.25-34	2.32-34	4.26-34	7.83-34
23	0.00+00	1.25-36	1.50-36	2.15-36	3.42-36	5.98-36	1.11-35	2.14-35	4.11-35	7.83-35	1.47-34	2.75-34	5.12-34	9.60-34
22	0.00+00	1.44-36	1.76-36	2.61-36	4.25-36	7.43-36	1.37-35	2.58-35	4.88-35	9.22-35	1.74-34	3.26-34	6.17-34	1.19-33
21	0.00+00	1.67-36	2.08-36	3.17-36	5.23-36	9.16-36	1.67-35	3.09-35	5.78-35	1.08-34	2.04-34	3.88-34	7.49-34	1.49-33
20	0.00+00	1.94-36	2.46-36	3.83-36	6.42-36	1.12-35	2.02-35	3.69-35	6.82-35	1.27-34	2.40-34	4.63-34	9.18-34	1.92-33
19	0.00+00	2.28-36	2.93-36	4.64-36	7.85-36	1.37-35	2.44-35	4.41-35	8.06-35	1.50-34	2.84-34	5.55-34	1.14-33	2.53-33
18	0.00+00	2.68-36	3.50-36	5.62-36	9.61-36	1.68-35	2.97-35	5.30-35	9.59-35	1.77-34	3.38-34	6.72-34	1.43-33	3.41-33
17	0.00+00	3.20-36	4.21-36	6.84-36	1.18-35	2.07-35	3.65-35	6.46-35	1.16-34	2.13-34	4.04-34	8.07-34	1.73-33	4.05-33
16	0.00+00	3.85-36	5.12-36	8.47-36	1.48-35	2.60-35	4.58-35	8.09-35	1.44-34	2.61-34	4.79-34	8.63-34	1.03-33	-1.49-32
15	0.00+00	4.71-36	6.33-36	1.06-35	1.88-35	3.35-35	5.95-35	1.05-34	1.86-34	3.21-34	4.79-34	-1.94-34	-2.28-32	
14	0.00+00	5.86-36	7.97-36	1.36-35	2.47-35	4.49-35	8.15-35	1.46-34	2.51-34	3.53-34	-4.16-34	-2.29-32		
13	0.00+00	7.45-36	1.03-35	1.81-35	3.37-35	6.36-35	1.20-34	2.18-34	3.42-34	-1.61-34	-1.89-32			
12	0.00+00	9.69-36	1.37-35	2.49-35	4.86-35	9.69-35	1.93-34	3.57-34	2.38-34	-1.31-32				
11	0.00+00	1.30-35	1.89-35	3.61-35	7.53-35	1.63-34	3.55-34	5.86-34	-7.21-33					
10	0.00+00	1.81-35	2.74-35	5.61-35	1.29-34	3.20-34	7.85-34	-2.10-33						
9	0.00+00	2.65-35	4.26-35	9.66-35	2.61-34	8.11-34	1.53-33							
8	0.00+00	4.13-35	7.28-35	1.95-34	7.02-34	3.41-33								
7	0.00+00	7.08-35	1.45-34	5.30-34	3.70-33									
6	0.00+00	1.41-34	3.83-34	2.97-33										
5	0.00+00	3.67-34	2.03-33											
4	0.00+00	1.82-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-3.87-35	-5.30-35	-7.32-35	-1.02-34	-1.44-34	-2.04-34	-2.92-34	-4.20-34	-6.05-34	-8.71-34	-1.25-33	-1.79-33	-2.56-33	-3.63-33
45	-1.41-35	-1.67-35	-2.12-35	-2.96-35	-4.56-35	-7.50-35	-1.27-34	-2.17-34	-3.68-34	-6.13-34	-1.00-33	-1.62-33	-2.58-33	-4.06-33
40	4.39-35	7.14-35	1.10-34	1.62-34	2.28-34	3.12-34	4.09-34	5.15-34	6.14-34	6.77-34	6.46-34	4.18-34	-2.05-34	-1.58-33
35	1.62-34	2.59-34	4.05-34	6.18-34	9.29-34	1.38-33	2.03-33	2.97-33	4.32-33	6.29-33	9.21-33	1.36-32	2.03-32	3.10-32
30	4.27-34	7.10-34	1.17-33	1.91-33	3.15-33	5.21-33	8.79-33	1.52-32	2.76-32	5.32-32	1.13-31	2.86-31	9.86-31	7.36-30
29	5.18-34	8.71-34	1.46-33	2.44-33	4.12-33	7.07-33	1.25-32	2.30-32	4.51-32	9.79-32	2.51-31	8.85-31	6.77-30	
28	6.29-34	1.07-33	1.83-33	3.15-33	5.50-33	9.86-33	1.84-32	3.67-32	8.10-32	2.11-31	7.55-31	5.88-30		
27	7.68-34	1.33-33	2.33-33	4.14-33	7.52-33	1.43-32	2.88-32	6.44-32	1.70-31	6.16-31	4.85-30			
26	9.41-34	1.67-33	3.01-33	5.55-33	1.07-32	2.18-32	4.92-32	1.31-31	4.80-31	3.80-30				
25	1.16-33	2.12-33	3.97-33	7.70-33	1.59-32	3.62-32	9.72-32	3.57-31	2.84-30					
24	1.45-33	2.74-33	5.37-33	1.12-32	2.56-32	6.90-32	2.54-31	2.01-30						
23	1.83-33	3.62-33	7.58-33	1.74-32	4.70-32	1.72-31	1.35-30							
22	2.36-33	4.96-33	1.14-32	3.06-32	1.11-31	8.57-31								
21	3.13-33	7.17-33	1.91-32	6.80-32	5.09-31									
20	4.34-33	1.13-32	3.92-32	2.79-31										
19	6.40-33	2.10-32	1.36-31											
18	1.01-32	5.19-32												
17	6.77-33													

H TE = 1.25+04 NE = 1.00+05 CASE B NC = 62

TOTAL RC = 2.155-13 4-2 RC = 2.497-14 4-2 EM = 1.021-25 2S RC = 7.213-14 2P RC = 1.434-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.35-04	2.56-04	1.10-04	5.71-05	3.33-05	2.11-05	1.42-05	1.00-05	7.31-06	5.51-06	4.25-06	3.35-06	2.68-06	2.18-06
45	1.11-03	3.42-04	1.47-04	7.61-05	4.44-05	2.81-05	1.89-05	1.33-05	9.75-06	7.34-06	5.67-06	4.47-06	3.58-06	2.91-06
40	1.51-03	4.64-04	2.00-04	1.03-04	6.04-05	3.82-05	2.57-05	1.81-05	1.33-05	9.99-06	7.71-06	6.07-06	4.87-06	3.96-06
35	2.10-03	6.46-04	2.78-04	1.44-04	8.41-05	5.33-05	3.59-05	2.53-05	1.85-05	1.39-05	1.08-05	8.47-06	6.79-06	5.53-06
30	3.07-03	9.43-04	4.06-04	2.11-04	1.23-04	7.83-05	5.27-05	3.72-05	2.72-05	2.05-05	1.58-05	1.25-05	1.00-05	8.14-06
29	3.34-03	1.03-03	4.43-04	2.30-04	1.35-04	8.54-05	5.76-05	4.06-05	2.97-05	2.24-05	1.73-05	1.36-05	1.09-05	8.90-06
28	3.65-03	1.12-03	4.85-04	2.52-04	1.48-04	9.37-05	6.32-05	4.46-05	3.26-05	2.46-05	1.90-05	1.50-05	1.20-05	9.77-06
27	4.01-03	1.23-03	5.33-04	2.77-04	1.62-04	1.03-04	6.97-05	4.92-05	3.60-05	2.72-05	2.10-05	1.65-05	1.33-05	1.08-05
26	4.42-03	1.36-03	5.89-04	3.07-04	1.80-04	1.14-04	7.72-05	5.46-05	4.00-05	3.01-05	2.33-05	1.84-05	1.47-05	1.20-05
25	4.89-03	1.51-03	6.54-04	3.41-04	2.00-04	1.27-04	8.61-05	6.09-05	4.46-05	3.37-05	2.60-05	2.05-05	1.65-05	1.34-05
24	5.43-03	1.68-03	7.29-04	3.81-04	2.24-04	1.43-04	9.65-05	6.83-05	5.01-05	3.78-05	2.92-05	2.31-05	1.85-05	1.51-05
23	6.05-03	1.88-03	8.16-04	4.27-04	2.52-04	1.61-04	1.09-04	7.71-05	5.66-05	4.28-05	3.31-05	2.61-05	2.09-05	1.70-05
22	6.77-03	2.10-03	9.18-04	4.82-04	2.85-04	1.82-04	1.24-04	8.76-05	6.44-05	4.87-05	3.77-05	2.98-05	2.39-05	1.94-05
21	7.60-03	2.37-03	1.04-03	5.48-04	3.24-04	2.08-04	1.41-04	1.00-04	7.39-05	5.59-05	4.33-05	3.42-05	2.74-05	2.23-05
20	8.58-03	2.69-03	1.18-03	6.26-04	3.72-04	2.39-04	1.63-04	1.16-04	8.54-05	6.47-05	5.02-05	3.96-05	3.17-05	2.58-05
19	9.74-03	3.06-03	1.36-03	7.21-04	4.30-04	2.78-04	1.90-04	1.35-04	9.98-05	7.56-05	5.86-05	4.63-05	3.70-05	3.00-05
18	1.11-02	3.52-03	1.57-03	8.39-04	5.03-04	3.25-04	2.23-04	1.59-04	1.18-04	8.93-05	6.92-05	5.45-05	4.35-05	3.50-05
17	1.29-02	4.07-03	1.83-03	9.86-04	5.94-04	3.86-04	2.65-04	1.90-04	1.40-04	1.06-04	8.24-05	6.48-05	5.13-05	4.05-05
16	1.50-02	4.77-03	2.16-03	1.17-03	7.11-04	4.64-04	3.19-04	2.29-04	1.69-04	1.28-04	9.90-05	7.72-05	6.01-05	4.46-05
15	1.77-02	5.67-03	2.59-03	1.42-03	8.62-04	5.65-04	3.90-04	2.79-04	2.07-04	1.56-04	1.19-04	9.15-05	6.69-05	
14	2.13-02	6.83-03	3.16-03	1.74-03	1.06-03	6.98-04	4.82-04	3.46-04	2.55-04	1.91-04	1.44-04	1.03-04		
13	2.60-02	8.40-03	3.92-03	2.17-03	1.33-03	8.78-04	6.06-04	4.33-04	3.16-04	2.33-04	1.64-04			
12	3.23-02	1.06-02	4.97-03	2.77-03	1.71-03	1.12-03	7.73-04	5.48-04	3.93-04	2.72-04				
11	4.14-02	1.36-02	6.45-03	3.61-03	2.23-03	1.46-03	1.00-03	6.97-04	4.69-04					
10	5.45-02	1.81-02	8.62-03	4.84-03	2.98-03	1.95-03	1.31-03	8.54-04						
9	7.46-02	2.49-02	1.19-02	6.68-03	4.10-03	2.63-03	1.66-03							
8	1.07-01	3.56-02	1.71-02	9.56-03	5.78-03	3.49-03								
7	1.61-01	5.38-02	2.58-02	1.43-02	8.14-03									
6	2.62-01	8.71-02	4.14-02	2.17-02										
5	4.72-01	1.55-01	7.03-02											
4	1.00+00	3.10-01												
3	2.79+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.80-06	1.50-06	1.27-06	1.08-06	9.25-07	7.99-07	6.95-07	6.08-07	5.35-07	4.74-07	4.21-07	3.76-07	3.37-07	3.03-07
45	2.40-06	2.00-06	1.69-06	1.44-06	1.23-06	1.06-06	9.26-07	8.10-07	7.13-07	6.31-07	5.60-07	5.00-07	4.48-07	4.03-07
40	3.27-06	2.73-06	2.30-06	1.95-06	1.67-06	1.45-06	1.26-06	1.10-06	9.68-07	8.55-07	7.59-07	6.77-07	6.06-07	5.45-07
35	4.56-06	3.80-06	3.20-06	2.72-06	2.33-06	2.01-06	1.75-06	1.53-06	1.34-06	1.19-06	1.05-06	9.36-07	8.35-07	7.47-07
30	6.71-06	5.59-06	4.71-06	4.00-06	3.43-06	2.95-06	2.56-06	2.23-06	1.95-06	1.71-06	1.51-06	1.32-06	1.14-06	9.31-07
29	7.33-06	6.11-06	5.15-06	4.37-06	3.74-06	3.22-06	2.79-06	2.43-06	2.12-06	1.85-06	1.62-06	1.39-06	1.13-06	
28	8.05-06	6.71-06	5.65-06	4.80-06	4.10-06	3.53-06	3.05-06	2.65-06	2.31-06	2.00-06	1.72-06	1.39-06		
27	8.89-06	7.41-06	6.24-06	5.29-06	4.52-06	3.89-06	3.35-06	2.90-06	2.51-06	2.14-06	1.73-06			
26	9.87-06	8.23-06	6.92-06	5.87-06	5.01-06	4.29-06	3.69-06	3.17-06	2.69-06	2.16-06				
25	1.10-05	9.19-06	7.72-06	6.54-06	5.57-06	4.76-06	4.06-06	3.43-06	2.74-06					
24	1.24-05	1.03-05	8.66-06	7.32-06	6.21-06	5.27-06	4.43-06	3.52-06						
23	1.40-05	1.17-05	9.77-06	8.23-06	6.93-06	5.78-06	4.57-06							
22	1.60-05	1.33-05	1.11-05	9.25-06	7.67-06	6.02-06								
21	1.83-05	1.51-05	1.26-05	1.03-05	8.05-06									
20	2.11-05	1.73-05	1.41-05	1.09-05										
19	2.44-05	1.97-05	1.51-05											
18	2.79-05	2.12-05												
17	3.05-05													

H TE = 1.25+04 NE = 1.00+05 CASE B NC = 62

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	8.33-38	-1.51-38	-2.69-37	-8.26-37	-1.88-36	-3.67-36	-6.58-36	-1.11-35	-1.79-35	-2.80-35	-4.28-35	-6.43-35	-9.52-35
45	0.00+00	1.18-37	-5.26-39	-3.24-37	-1.02-36	-2.34-36	-4.59-36	-8.24-36	-1.39-35	-2.25-35	-3.55-35	-5.47-35	-8.30-35	-1.24-34
40	0.00+00	1.77-37	2.80-38	-3.55-37	-1.19-36	-2.77-36	-5.44-36	-9.74-36	-1.64-35	-2.67-35	-4.22-35	-6.56-35	-1.01-34	-1.54-34
35	0.00+00	2.83-37	1.18-37	-2.97-37	-1.20-36	-2.86-36	-5.60-36	-9.89-36	-1.64-35	-2.63-35	-4.13-35	-6.45-35	-1.01-34	-1.58-34
30	0.00+00	4.85-37	3.27-37	-5.37-38	-8.61-37	-2.22-36	-4.21-36	-6.83-36	-1.01-35	-1.40-35	-1.91-35	-2.67-35	-3.98-35	-6.48-35
29	0.00+00	5.44-37	3.91-37	2.66-38	-7.39-37	-1.99-36	-3.69-36	-6.69-36	-7.70-36	-9.38-36	-1.05-35	-1.13-35	-1.34-35	-2.15-35
28	0.00+00	6.13-37	4.65-37	1.21-37	-5.95-37	-1.71-36	-3.09-36	-4.35-36	-4.87-36	-3.73-36	2.24-37	8.12-36	2.05-35	3.58-35
27	0.00+00	6.92-37	5.53-37	2.34-37	-4.21-37	-1.38-36	-2.36-36	-2.75-36	-1.46-36	3.15-36	1.35-35	3.27-35	6.46-35	1.13-34
26	0.00+00	7.86-37	6.57-37	3.71-37	-2.08-37	-9.67-37	-1.47-36	-7.89-37	2.72-36	1.17-35	3.03-35	6.44-35	1.23-34	2.18-34
25	0.00+00	8.96-37	7.83-37	5.42-37	6.41-38	-4.46-37	-3.52-37	1.67-36	7.98-36	2.26-35	5.19-35	1.06-34	2.02-34	3.66-34
24	0.00+00	1.03-36	9.37-37	7.59-37	4.19-37	2.37-37	1.10-36	4.83-36	1.48-35	3.67-35	8.06-35	1.63-34	3.13-34	5.82-34
23	0.00+00	1.18-36	1.13-36	1.04-36	8.93-37	1.15-36	3.03-36	9.00-36	2.37-35	5.55-35	1.19-34	2.42-34	4.74-34	9.09-34
22	0.00+00	1.38-36	1.37-36	1.41-36	1.53-36	2.40-36	5.62-36	1.46-35	3.57-35	8.09-35	1.73-34	3.55-34	7.13-34	1.42-33
21	0.00+00	1.61-36	1.67-36	1.89-36	2.40-36	4.08-36	9.13-36	2.20-35	5.18-35	1.16-34	2.48-34	5.20-34	1.08-33	2.28-33
20	0.00+00	1.90-36	2.06-36	2.53-36	3.56-36	6.37-36	1.39-35	3.21-35	7.37-35	1.64-34	3.56-34	7.68-34	1.68-33	3.81-33
19	0.00+00	2.25-36	2.55-36	3.37-36	5.13-36	9.46-36	2.02-35	4.57-35	1.04-34	2.32-34	5.15-34	1.16-33	2.71-33	6.03-33
18	0.00+00	2.70-36	3.18-36	4.48-36	7.23-36	1.36-35	2.88-35	6.41-35	1.45-34	3.29-34	7.56-34	1.81-33	4.65-33	1.38-32
17	0.00+00	3.26-36	3.99-36	5.94-36	1.00-35	1.92-35	4.04-35	8.93-35	2.03-34	4.72-34	1.14-33	2.98-33	8.94-33	3.57-32
16	0.00+00	3.97-36	5.04-36	7.86-36	1.38-35	2.67-35	5.61-35	1.24-34	2.86-34	6.93-34	1.81-33	5.42-33	2.14-32	1.73-31
15	0.00+00	4.89-36	6.40-36	1.04-35	1.88-35	3.70-35	7.78-35	1.74-34	4.12-34	1.06-33	3.11-33	1.19-32	8.99-32	
14	0.00+00	6.10-36	8.20-36	1.38-35	2.58-35	5.13-35	1.09-34	2.48-34	6.13-34	1.73-33	6.22-33	4.11-32		
13	0.00+00	7.73-36	1.07-35	1.86-35	3.56-35	7.25-35	1.57-34	3.67-34	9.69-34	3.13-33	1.57-32			
12	0.00+00	1.00-35	1.41-35	2.56-35	5.07-35	1.06-34	2.38-34	5.85-34	1.64-33	4.30-33				
11	0.00+00	1.33-35	1.94-35	3.66-35	7.62-35	1.69-34	4.03-34	1.03-33	5.86-34					
10	0.00+00	1.84-35	2.78-35	5.58-35	1.26-34	3.09-34	8.15-34	4.68-34						
9	0.00+00	2.68-35	4.27-35	9.40-35	2.44-34	7.25-34	1.64-33							
8	0.00+00	4.16-35	7.22-35	1.86-34	6.26-34	2.73-33								
7	0.00+00	7.11-35	1.43-34	4.93-34	3.08-33									
6	0.00+00	1.41-34	3.73-34	2.66-33										
5	0.00+00	3.67-34	1.94-33											
4	0.00+00	1.82-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.39-34	-2.01-34	-2.88-34	-4.07-34	-5.71-34	-7.93-34	-1.09-33	-1.49-33	-2.01-33	-2.70-33	-3.60-33	-4.78-33	-6.29-33	-8.28-33
45	-1.84-34	-2.71-34	-3.96-34	-5.72-34	-8.20-34	-1.17-33	-1.65-33	-2.31-33	-3.22-33	-4.47-33	-6.18-33	-8.52-33	-1.17-32	-1.61-32
40	-2.34-34	-3.53-34	-5.30-34	-7.93-34	-1.18-33	-1.74-33	-2.57-33	-3.77-33	-5.54-33	-8.13-33	-1.19-32	-1.76-32	-2.61-32	-3.90-32
35	-2.50-34	-3.96-34	-6.29-34	-1.00-33	-1.60-33	-2.54-33	-4.06-33	-6.50-33	-1.05-32	-1.72-32	-2.87-32	-4.89-32	-8.63-32	-1.59-31
30	-1.15-34	-2.17-34	-4.18-34	-8.14-34	-1.58-33	-3.08-33	-6.06-33	-1.22-32	-2.55-32	-5.67-32	-1.40-31	-4.09-31	-1.64-30	-1.45-29
29	-4.66-35	-1.13-34	-2.68-34	-6.14-34	-1.35-33	-2.93-33	-6.34-33	-1.41-32	-3.29-32	-8.45-32	-2.56-31	-1.07-30	-9.76-30	
28	4.74-35	3.66-35	-4.01-35	-2.82-34	-9.13-34	-2.47-33	-6.30-33	-1.63-32	-4.50-32	-1.45-31	-6.35-31	-6.07-30		
27	1.78-34	2.54-34	3.12-34	2.74-34	-7.60-35	-1.34-33	-5.32-33	-1.83-32	-6.75-32	-3.25-31	-3.35-30			
26	3.64-34	5.79-34	8.75-34	1.24-33	1.57-33	1.38-33	-1.38-33	-1.69-32	-1.17-31	-1.47-30				
25	6.38-34	1.09-33	1.82-33	3.02-33	5.04-33	8.45-33	1.37-32	1.35-32	-2.44-31					
24	1.06-33	1.92-33	3.50-33	6.60-33	1.33-32	3.03-32	8.82-32	4.88-31						
23	1.74-33	3.37-33	6.78-33	1.47-32	3.69-32	1.24-31	8.67-31							
22	2.89-33	6.11-33	1.40-32	3.70-32	1.32-31	1.00-30								
21	5.02-33	1.19-32	3.29-32	1.22-31	9.69-31									
20	9.37-33	2.67-32	1.02-31	8.35-31										
19	1.99-32	7.82-32	6.51-31											
18	5.50-32	4.61-31												
17	2.97-31													

H TE = 1.25+04 NE = 1.00+06 CASE B NC = 39

TOTAL RC = 2.167-13 4-2 RC = 2.511-14 4-2 EM = 1.026-25 2S RC = 7.267-14 2P RC = 1.440-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.63-04	2.65-04	1.14-04	5.89-05	3.44-05	2.18-05	1.47-05	1.03-05	7.55-06	5.69-06	4.39-06	3.46-06	2.77-06	2.26-06
45	1.18-03	3.61-04	1.55-04	8.04-05	4.69-05	2.97-05	2.00-05	1.41-05	1.03-05	7.75-06	5.98-06	4.71-06	3.77-06	3.07-06
40	1.66-03	5.08-04	2.18-04	1.13-04	6.59-05	4.17-05	2.81-05	1.98-05	1.45-05	1.09-05	8.40-06	6.62-06	5.30-06	4.31-06
35	2.40-03	7.36-04	3.16-04	1.64-04	9.56-05	6.05-05	4.07-05	2.87-05	2.10-05	1.58-05	1.22-05	9.59-06	7.68-06	6.25-06
30	3.60-03	1.10-03	4.75-04	2.46-04	1.43-04	9.08-05	6.11-05	4.31-05	3.15-05	2.37-05	1.83-05	1.44-05	1.15-05	9.36-06
29	3.92-03	1.20-03	5.17-04	2.68-04	1.56-04	9.89-05	6.66-05	4.69-05	3.43-05	2.58-05	1.99-05	1.56-05	1.25-05	1.02-05
28	4.27-03	1.31-03	5.64-04	2.92-04	1.70-04	1.08-04	7.26-05	5.11-05	3.74-05	2.81-05	2.17-05	1.71-05	1.37-05	1.11-05
27	4.67-03	1.43-03	6.16-04	3.19-04	1.86-04	1.18-04	7.93-05	5.59-05	4.08-05	3.07-05	2.37-05	1.86-05	1.49-05	1.21-05
26	5.11-03	1.57-03	6.75-04	3.50-04	2.04-04	1.29-04	8.69-05	6.12-05	4.47-05	3.37-05	2.59-05	2.04-05	1.63-05	1.33-05
25	5.61-03	1.72-03	7.41-04	3.84-04	2.24-04	1.42-04	9.55-05	6.73-05	4.92-05	3.70-05	2.85-05	2.24-05	1.79-05	1.46-05
24	6.19-03	1.90-03	8.18-04	4.24-04	2.47-04	1.57-04	1.05-04	7.43-05	5.43-05	4.08-05	3.15-05	2.47-05	1.98-05	1.61-05
23	6.86-03	2.11-03	9.06-04	4.70-04	2.74-04	1.74-04	1.17-04	8.24-05	6.02-05	4.53-05	3.49-05	2.74-05	2.19-05	1.78-05
22	7.64-03	2.35-03	1.01-03	5.25-04	3.06-04	1.94-04	1.31-04	9.21-05	6.73-05	5.06-05	3.90-05	3.06-05	2.45-05	1.99-05
21	8.58-03	2.64-03	1.14-03	5.90-04	3.45-04	2.19-04	1.47-04	1.04-04	7.58-05	5.70-05	4.39-05	3.45-05	2.75-05	2.23-05
20	9.71-03	2.99-03	1.29-03	6.69-04	3.91-04	2.48-04	1.67-04	1.18-04	8.61-05	6.48-05	4.99-05	3.92-05	3.12-05	2.52-05
19	1.11-02	3.41-03	1.47-03	7.66-04	4.48-04	2.85-04	1.92-04	1.35-04	9.88-05	7.43-05	5.72-05	4.49-05	3.57-05	2.88-05
18	1.27-02	3.93-03	1.70-03	8.85-04	5.18-04	3.30-04	2.22-04	1.57-04	1.15-04	8.62-05	6.63-05	5.19-05	4.12-05	3.29-05
17	1.47-02	4.56-03	1.98-03	1.03-03	6.06-04	3.86-04	2.60-04	1.84-04	1.34-04	1.01-04	7.76-05	6.06-05	4.78-05	3.76-05
16	1.72-02	5.34-03	2.32-03	1.22-03	7.16-04	4.57-04	3.09-04	2.18-04	1.60-04	1.20-04	9.19-05	7.13-05	5.54-05	4.10-05
15	2.03-02	6.31-03	2.76-03	1.45-03	8.58-04	5.49-04	3.72-04	2.63-04	1.92-04	1.44-04	1.10-04	8.39-05	6.14-05	
14	2.41-02	7.55-03	3.32-03	1.76-03	1.04-03	6.70-04	4.55-04	3.22-04	2.35-04	1.75-04	1.32-04	9.48-05		
13	2.92-02	9.16-03	4.07-03	2.17-03	1.29-03	8.33-04	5.67-04	4.01-04	2.91-04	2.14-04	1.51-04			
12	3.59-02	1.13-02	5.07-03	2.73-03	1.64-03	1.06-03	7.21-04	5.08-04	3.64-04	2.52-04				
11	4.51-02	1.43-02	6.49-03	3.52-03	2.13-03	1.38-03	9.34-04	6.48-04	4.37-04					
10	5.84-02	1.86-02	8.56-03	4.69-03	2.84-03	1.83-03	1.23-03	8.00-04						
9	7.83-02	2.52-02	1.17-02	6.46-03	3.91-03	2.49-03	1.56-03							
8	1.10-01	3.57-02	1.68-02	9.25-03	5.52-03	3.31-03								
7	1.63-01	5.36-02	2.53-02	1.38-02	7.75-03									
6	2.64-01	8.65-02	4.04-02	2.08-02										
5	4.73-01	1.53-01	6.80-02											
4	1.00+00	3.03-01												
3	2.78+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.86-06	1.55-06	1.31-06	1.11-06	9.54-07	8.24-07	7.17-07	6.28-07	5.52-07	4.89-07	4.34-07	3.88-07	3.47-07	3.13-07
45	2.53-06	2.11-06	1.78-06	1.51-06	1.30-06	1.12-06	9.75-07	8.54-07	7.51-07	6.64-07	5.90-07	5.26-07	4.72-07	4.24-07
40	3.56-06	2.97-06	2.50-06	2.12-06	1.82-06	1.57-06	1.37-06	1.20-06	1.05-06	9.29-07	8.25-07	7.35-07	6.58-07	5.91-07
35	5.15-06	4.29-06	3.62-06	3.07-06	2.63-06	2.27-06	1.97-06	1.72-06	1.51-06	1.34-06	1.18-06	1.05-06	9.40-07	8.40-07
30	7.71-06	6.42-06	5.40-06	4.59-06	3.92-06	3.38-06	2.93-06	2.55-06	2.23-06	1.96-06	1.72-06	1.50-06	1.30-06	1.06-06
29	8.39-06	6.99-06	5.88-06	4.99-06	4.26-06	3.67-06	3.18-06	2.76-06	2.41-06	2.11-06	1.84-06	1.58-06	1.28-06	
28	9.14-06	7.61-06	6.40-06	5.43-06	4.64-06	3.99-06	3.45-06	2.99-06	2.60-06	2.26-06	1.93-06	1.56-06		
27	9.98-06	8.31-06	6.98-06	5.92-06	5.05-06	4.34-06	3.74-06	3.23-06	2.79-06	2.38-06	1.92-06			
26	1.09-05	9.09-06	7.63-06	6.46-06	5.51-06	4.72-06	4.05-06	3.48-06	2.95-06	2.37-06				
25	1.20-05	9.97-06	8.36-06	7.07-06	6.01-06	5.13-06	4.38-06	3.69-06	2.95-06					
24	1.32-05	1.10-05	9.19-06	7.75-06	6.57-06	5.57-06	4.67-06	3.71-06						
23	1.46-05	1.21-05	1.01-05	8.52-06	7.17-06	5.97-06	4.71-06							
22	1.63-05	1.35-05	1.12-05	9.37-06	7.75-06	6.08-06								
21	1.82-05	1.50-05	1.24-05	1.02-05	7.95-06									
20	2.06-05	1.69-05	1.37-05	1.06-05										
19	2.33-05	1.88-05	1.44-05											
18	2.62-05	1.99-05												
17	2.82-05													

H TE = 1.25+04 NE = 1.00+06 CASE B NC = 39

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	8.04-38	-3.21-38	-3.30-37	-9.98-37	-2.30-36	-4.60-36	-8.47-36	-1.47-35	-2.42-35	-3.87-35	-5.99-35	-9.03-35	-1.33-34
45	0.00+00	1.11-37	-4.11-38	-4.46-37	-1.36-36	-3.14-36	-6.34-36	-1.17-35	-2.05-35	-3.41-35	-5.49-35	-8.59-35	-1.31-34	-1.96-34
40	0.00+00	1.61-37	-4.94-38	-6.13-37	-1.89-36	-4.41-36	-8.96-36	-1.67-35	-2.94-35	-4.97-35	-8.10-35	-1.29-34	-2.00-34	-3.04-34
35	0.00+00	2.50-37	-3.99-38	-8.21-37	-2.61-36	-6.17-36	-1.27-35	-2.40-35	-4.28-35	-7.35-35	-1.22-34	-1.99-34	-3.18-34	-4.98-34
30	0.00+00	4.24-37	4.04-38	-1.00-36	-3.42-36	-8.30-36	-1.74-35	-3.34-35	-6.11-35	-1.08-34	-1.85-34	-3.13-34	-5.23-34	-8.63-34
29	0.00+00	4.79-37	7.81-38	-1.01-36	-3.55-36	-8.67-36	-1.82-35	-3.53-35	-6.48-35	-1.15-34	-2.00-34	-3.41-34	-5.77-34	-9.67-34
28	0.00+00	5.42-37	1.28-37	-9.98-37	-3.64-36	-8.98-36	-1.90-35	-3.69-35	-6.81-35	-1.22-34	-2.14-34	-3.70-34	-6.35-34	-1.08-33
27	0.00+00	6.18-37	1.94-37	-9.62-37	-3.68-36	-9.19-36	-1.95-35	-3.82-35	-7.10-35	-1.28-34	-2.27-34	-3.99-34	-6.96-34	-1.21-33
26	0.00+00	7.07-37	2.78-37	-8.94-37	-3.66-36	-9.28-36	-1.98-35	-3.90-35	-7.30-35	-1.33-34	-2.39-34	-4.27-34	-7.60-34	-1.35-33
25	0.00+00	8.14-37	3.85-37	-7.87-37	-3.57-36	-9.21-36	-1.99-35	-3.92-35	-7.39-35	-1.36-34	-2.48-34	-4.52-34	-8.25-34	-1.51-33
24	0.00+00	9.42-37	5.19-37	-6.35-37	-3.39-36	-8.98-36	-1.95-35	-3.87-35	-7.35-35	-1.37-34	-2.54-34	-4.73-34	-8.88-34	-1.69-33
23	0.00+00	1.10-36	6.86-37	-4.34-37	-3.12-36	-8.55-36	-1.87-35	-3.74-35	-7.14-35	-1.35-34	-2.54-34	-4.87-34	-9.48-34	-1.89-33
22	0.00+00	1.28-36	8.91-37	-1.74-37	-2.75-36	-7.92-36	-1.75-35	-3.51-35	-6.73-35	-1.28-34	-2.48-34	-4.92-34	-1.00-33	-2.11-33
21	0.00+00	1.51-36	1.14-36	1.54-37	-2.27-36	-7.07-36	-1.58-35	-3.16-35	-6.07-35	-1.17-34	-2.32-34	-4.81-34	-1.04-33	-2.38-33
20	0.00+00	1.78-36	1.46-36	5.71-37	-1.63-36	-5.91-36	-1.35-35	-2.66-35	-5.04-35	-9.73-35	-1.99-34	-4.39-34	-1.04-33	-2.67-33
19	0.00+00	2.12-36	1.86-36	1.12-36	-7.71-37	-4.30-36	-1.00-35	-1.90-35	-3.40-35	-6.33-35	-1.34-34	-3.30-34	-9.21-34	-2.88-33
18	0.00+00	2.56-36	2.38-36	1.86-36	4.52-37	-1.91-36	-4.80-36	-7.04-36	-6.43-36	-1.30-36	1.62-36	-4.73-35	-3.93-34	-2.32-33
17	0.00+00	3.11-36	3.07-36	2.91-36	2.27-36	1.77-36	3.54-36	1.29-35	4.22-35	1.18-34	3.00-34	7.19-34	1.69-33	3.91-33
16	0.00+00	3.83-36	4.02-36	4.42-36	5.05-36	7.63-36	1.73-35	4.73-35	1.32-34	3.65-34	1.02-33	3.11-33	1.19-32	9.04-32
15	0.00+00	4.78-36	5.33-36	6.65-36	9.38-36	1.72-35	4.05-35	1.09-34	3.09-34	9.21-34	3.06-33	1.31-32	1.14-31	
14	0.00+00	6.07-36	7.18-36	1.00-35	1.62-35	3.29-35	8.10-35	2.25-34	6.84-34	2.38-33	1.08-32	1.00-31		
13	0.00+00	7.85-36	9.85-36	1.51-35	2.72-35	5.96-35	1.54-34	4.59-34	1.60-33	7.42-33	7.04-32			
12	0.00+00	1.03-35	1.37-35	2.30-35	4.54-35	1.07-34	2.97-34	9.98-34	4.52-33	4.17-32				
11	0.00+00	1.39-35	1.96-35	3.56-35	7.65-35	1.95-34	6.09-34	2.57-33	2.15-32					
10	0.00+00	1.93-35	2.88-35	5.70-35	1.35-34	3.85-34	1.46-33	1.02-32						
9	0.00+00	2.79-35	4.43-35	9.70-35	2.61-34	9.08-34	5.17-33							
8	0.00+00	4.29-35	7.41-35	1.87-34	6.34-34	3.38-33								
7	0.00+00	7.25-35	1.43-34	4.73-34	2.82-33									
6	0.00+00	1.43-34	3.66-34	2.37-33										
5	0.00+00	3.69-34	1.84-33											
4	0.00+00	1.82-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.92-34	-2.71-34	-3.75-34	-5.11-34	-6.85-34	-9.01-34	-1.16-33	-1.48-33	-1.85-33	-2.28-33	-2.77-33	-3.34-33	-4.00-33	-4.77-33
45	-2.86-34	-4.10-34	-5.79-34	-8.03-34	-1.10-33	-1.48-33	-1.96-33	-2.55-33	-3.28-33	-4.16-33	-5.24-33	-6.55-33	-8.17-33	-1.02-32
40	-4.54-34	-6.66-34	-9.64-34	-1.38-33	-1.94-33	-2.70-33	-3.71-33	-5.04-33	-6.78-33	-9.06-33	-1.21-32	-1.61-32	-2.15-32	-2.91-32
35	-7.68-34	-1.17-33	-1.77-33	-2.64-33	-3.92-33	-5.78-33	-8.48-33	-1.24-32	-1.81-32	-2.66-32	-3.97-32	-6.04-32	-9.51-32	-1.57-31
30	-1.41-33	-2.30-33	-3.75-33	-6.12-33	-1.00-32	-1.67-32	-2.81-32	-4.85-32	-8.73-32	-1.67-31	-3.54-31	-8.89-31	-3.08-30	-2.35-29
29	-1.61-33	-2.68-33	-4.46-33	-7.48-33	-1.27-32	-2.19-32	-3.88-32	-7.14-32	-1.40-31	-3.02-31	-7.73-31	-2.72-30	-2.10-29	
28	-1.84-33	-3.13-33	-5.37-33	-9.30-33	-1.64-32	-2.98-32	-5.63-32	-1.13-31	-2.49-31	-6.51-31	-2.33-30	-1.83-29		
27	-2.11-33	-3.69-33	-6.54-33	-1.18-32	-2.19-32	-4.24-32	-8.73-32	-1.98-31	-5.29-31	-1.94-30	-1.55-29			
26	-2.43-33	-4.39-33	-8.11-33	-1.54-32	-3.05-32	-6.45-32	-1.50-31	-4.12-31	-1.55-30	-1.27-29				
25	-2.81-33	-5.30-33	-1.03-32	-2.09-32	-4.52-32	-1.08-31	-3.05-31	-1.18-30	-9.90-30					
24	-3.27-33	-6.50-33	-1.35-32	-3.00-32	-7.35-32	-2.13-31	-8.48-31	-7.34-30						
23	-3.85-33	-8.21-33	-1.87-32	-4.70-32	-1.40-31	-5.74-31	-5.13-30							
22	-4.64-33	-1.09-32	-2.81-32	-8.61-32	-3.63-31	-3.35-30								
21	-5.77-33	-1.54-32	-4.89-32	-2.12-31	-2.02-30									
20	-7.52-33	-2.49-32	-1.13-31	-1.12-30										
19	-1.05-32	-5.12-32	-5.39-31											
18	-1.51-32	-1.92-31												
17	2.57-34													

H TE = 1.25+04 NE = 1.00+07 CASE B NC = 25

TOTAL RC = 2.189-13 4-2 RC = 2.535-14 4-2 EM = 1.036-25 2S RC = 7.358-14 2P RC = 1.453-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.61-04	2.64-04	1.14-04	5.88-05	3.43-05	2.17-05	1.46-05	1.03-05	7.54-06	5.67-06	4.38-06	3.45-06	2.77-06	2.25-06
45	1.18-03	3.62-04	1.56-04	8.06-05	4.70-05	2.98-05	2.00-05	1.41-05	1.03-05	7.78-06	6.00-06	4.73-06	3.79-06	3.08-06
40	1.68-03	5.15-04	2.21-04	1.15-04	6.69-05	4.23-05	2.85-05	2.01-05	1.47-05	1.10-05	8.52-06	6.71-06	5.38-06	4.38-06
35	2.50-03	7.66-04	3.29-04	1.70-04	9.93-05	6.29-05	4.23-05	2.98-05	2.18-05	1.64-05	1.26-05	9.95-06	7.98-06	6.49-06
30	3.91-03	1.20-03	5.16-04	2.67-04	1.56-04	9.85-05	6.63-05	4.67-05	3.41-05	2.56-05	1.98-05	1.56-05	1.25-05	1.01-05
29	4.31-03	1.32-03	5.68-04	2.94-04	1.72-04	1.09-04	7.30-05	5.14-05	3.76-05	2.82-05	2.18-05	1.71-05	1.37-05	1.11-05
28	4.77-03	1.46-03	6.28-04	3.25-04	1.89-04	1.20-04	8.06-05	5.68-05	4.15-05	3.12-05	2.40-05	1.89-05	1.51-05	1.23-05
27	5.28-03	1.62-03	6.95-04	3.60-04	2.10-04	1.33-04	8.93-05	6.28-05	4.59-05	3.45-05	2.66-05	2.09-05	1.67-05	1.36-05
26	5.86-03	1.80-03	7.72-04	3.99-04	2.33-04	1.47-04	9.90-05	6.97-05	5.09-05	3.83-05	2.95-05	2.32-05	1.86-05	1.51-05
25	6.50-03	1.99-03	8.56-04	4.43-04	2.58-04	1.63-04	1.10-04	7.74-05	5.65-05	4.25-05	3.27-05	2.57-05	2.06-05	1.67-05
24	7.24-03	2.22-03	9.54-04	4.94-04	2.88-04	1.82-04	1.22-04	8.62-05	6.29-05	4.73-05	3.64-05	2.86-05	2.29-05	1.86-05
23	8.09-03	2.48-03	1.07-03	5.51-04	3.21-04	2.03-04	1.37-04	9.62-05	7.02-05	5.28-05	4.06-05	3.19-05	2.55-05	2.07-05
22	9.05-03	2.78-03	1.19-03	6.17-04	3.60-04	2.28-04	1.53-04	1.08-04	7.85-05	5.90-05	4.54-05	3.56-05	2.85-05	2.30-05
21	1.02-02	3.11-03	1.34-03	6.92-04	4.03-04	2.55-04	1.71-04	1.21-04	8.80-05	6.61-05	5.08-05	3.99-05	3.18-05	2.57-05
20	1.14-02	3.50-03	1.50-03	7.78-04	4.53-04	2.87-04	1.93-04	1.36-04	9.88-05	7.42-05	5.70-05	4.47-05	3.56-05	2.87-05
19	1.29-02	3.95-03	1.70-03	8.78-04	5.12-04	3.24-04	2.17-04	1.53-04	1.11-04	8.36-05	6.42-05	5.03-05	3.99-05	3.21-05
18	1.46-02	4.48-03	1.93-03	9.97-04	5.81-04	3.67-04	2.47-04	1.73-04	1.26-04	9.47-05	7.26-05	5.67-05	4.49-05	3.58-05
17	1.67-02	5.13-03	2.20-03	1.14-03	6.65-04	4.20-04	2.82-04	1.98-04	1.44-04	1.08-04	8.27-05	6.43-05	5.06-05	3.97-05
16	1.93-02	5.93-03	2.55-03	1.32-03	7.69-04	4.87-04	3.27-04	2.29-04	1.67-04	1.25-04	9.50-05	7.34-05	5.67-05	4.19-05
15	2.26-02	6.96-03	2.99-03	1.55-03	9.04-04	5.72-04	3.83-04	2.69-04	1.95-04	1.45-04	1.10-04	8.37-05	6.09-05	
14	2.70-02	8.29-03	3.57-03	1.85-03	1.08-03	6.83-04	4.58-04	3.21-04	2.32-04	1.72-04	1.28-04	9.16-05		
13	3.26-02	1.00-02	4.33-03	2.25-03	1.31-03	8.32-04	5.57-04	3.89-04	2.80-04	2.04-04	1.43-04			
12	4.02-02	1.24-02	5.36-03	2.79-03	1.63-03	1.03-03	6.92-04	4.81-04	3.41-04	2.34-04				
11	5.04-02	1.56-02	6.78-03	3.54-03	2.08-03	1.32-03	8.77-04	6.01-04	4.02-04					
10	6.46-02	2.01-02	8.79-03	4.62-03	2.72-03	1.72-03	1.13-03	7.34-04						
9	8.56-02	2.67-02	1.18-02	6.24-03	3.68-03	2.30-03	1.44-03							
8	1.18-01	3.69-02	1.65-02	8.80-03	5.15-03	3.05-03								
7	1.72-01	5.40-02	2.45-02	1.30-02	7.22-03									
6	2.71-01	8.56-02	3.88-02	1.96-02										
5	4.78-01	1.50-01	6.47-02											
4	1.00+00	2.93-01												
3	2.75+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.86-06	1.55-06	1.31-06	1.11-06	9.52-07	8.23-07	7.16-07	6.26-07	5.51-07	4.88-07	4.33-07	3.87-07	3.47-07	3.12-07
45	2.54-06	2.12-06	1.79-06	1.52-06	1.30-06	1.13-06	9.79-07	8.57-07	7.54-07	6.66-07	5.92-07	5.28-07	4.73-07	4.26-07
40	3.61-06	3.01-06	2.53-06	2.16-06	1.85-06	1.60-06	1.39-06	1.21-06	1.07-06	9.43-07	8.37-07	7.46-07	6.68-07	6.00-07
35	5.35-06	4.46-06	3.75-06	3.19-06	2.73-06	2.36-06	2.05-06	1.79-06	1.57-06	1.39-06	1.23-06	1.09-06	9.74-07	8.71-07
30	8.34-06	6.95-06	5.84-06	4.96-06	4.24-06	3.65-06	3.17-06	2.76-06	2.41-06	2.11-06	1.85-06	1.62-06	1.40-06	1.14-06
29	9.18-06	7.64-06	6.43-06	5.45-06	4.66-06	4.01-06	3.47-06	3.02-06	2.63-06	2.30-06	2.00-06	1.72-06	1.40-06	
28	1.01-05	8.42-06	7.08-06	6.00-06	5.13-06	4.41-06	3.81-06	3.30-06	2.87-06	2.49-06	2.13-06	1.72-06		
27	1.12-05	9.31-06	7.82-06	6.62-06	5.65-06	4.85-06	4.18-06	3.61-06	3.11-06	2.65-06	2.14-06			
26	1.24-05	1.03-05	8.65-06	7.32-06	6.23-06	5.34-06	4.58-06	3.93-06	3.33-06	2.67-06				
25	1.37-05	1.14-05	9.56-06	8.08-06	6.87-06	5.86-06	4.99-06	4.21-06	3.36-06					
24	1.52-05	1.27-05	1.06-05	8.93-06	7.56-06	6.40-06	5.37-06	4.26-06						
23	1.70-05	1.41-05	1.17-05	9.86-06	8.29-06	6.90-06	5.44-06							
22	1.89-05	1.56-05	1.30-05	1.08-05	8.95-06	7.01-06								
21	2.10-05	1.73-05	1.43-05	1.17-05	9.12-06									
20	2.34-05	1.91-05	1.55-05	1.20-05										
19	2.59-05	2.09-05	1.59-05											
18	2.85-05	2.16-05												
17	2.97-05													

H TE = 1.25+04 NE = 1.00+07 CASE B NC = 25

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	8.02-38	-4.00-38	-3.68-37	-1.12-36	-2.61-36	-5.25-36	-9.62-36	-1.65-35	-2.69-35	-4.20-35	-6.30-35	-9.13-35	-1.27-34
45	0.00+00	1.10-37	-5.52-38	-5.09-37	-1.56-36	-3.64-36	-7.36-36	-1.36-35	-2.35-35	-3.87-35	-6.09-35	-9.24-35	-1.35-34	-1.92-34
40	0.00+00	1.58-37	-7.86-38	-7.32-37	-2.25-36	-5.29-36	-1.08-35	-2.01-35	-3.52-35	-5.86-35	-9.36-35	-1.44-34	-2.15-34	-3.10-34
35	0.00+00	2.38-37	-1.14-37	-1.10-36	-3.41-36	-8.11-36	-1.67-35	-3.16-35	-5.62-35	-9.52-35	-1.55-34	-2.45-34	-3.75-34	-5.57-34
30	0.00+00	3.86-37	-1.63-37	-1.72-36	-5.45-36	-1.32-35	-2.77-35	-5.34-35	-9.74-35	-1.70-34	-2.87-34	-4.71-34	-7.54-34	-1.18-33
29	0.00+00	4.31-37	-1.72-37	-1.89-36	-6.01-36	-1.46-35	-3.08-35	-5.99-35	-1.10-34	-1.94-34	-3.30-34	-5.48-34	-8.87-34	-1.41-33
28	0.00+00	4.83-37	-1.79-37	-2.07-36	-6.65-36	-1.62-35	-3.45-35	-6.74-35	-1.25-34	-2.22-34	-3.82-34	-6.41-34	-1.05-33	-1.70-33
27	0.00+00	5.44-37	-1.82-37	-2.27-36	-7.35-36	-1.80-35	-3.86-35	-7.61-35	-1.42-34	-2.55-34	-4.45-34	-7.57-34	-1.27-33	-2.08-33
26	0.00+00	6.17-37	-1.80-37	-2.48-36	-8.13-36	-2.01-35	-4.33-35	-8.61-35	-1.62-34	-2.95-34	-5.21-34	-9.02-34	-1.54-33	-2.58-33
25	0.00+00	7.07-37	-1.57-37	-2.67-36	-8.88-36	-2.22-35	-4.82-35	-9.67-35	-1.84-34	-3.40-34	-6.10-34	-1.08-33	-1.88-33	-3.24-33
24	0.00+00	8.14-37	-1.26-37	-2.88-36	-9.76-36	-2.46-35	-5.40-35	-1.09-34	-2.12-34	-3.96-34	-7.25-34	-1.31-33	-2.34-33	-4.18-33
23	0.00+00	9.46-37	-7.15-38	-3.08-36	-1.07-35	-2.72-35	-6.04-35	-1.24-34	-2.43-34	-4.64-34	-8.68-34	-1.61-33	-2.97-33	-5.52-33
22	0.00+00	1.11-36	1.80-38	-3.25-36	-1.16-35	-2.99-35	-6.72-35	-1.40-34	-2.80-34	-5.45-34	-1.05-33	-2.00-33	-3.86-33	-7.53-33
21	0.00+00	1.31-36	1.58-37	-3.34-36	-1.24-35	-3.26-35	-7.44-35	-1.58-34	-3.21-34	-6.42-34	-1.27-33	-2.54-33	-5.14-33	-1.07-32
20	0.00+00	1.57-36	3.69-37	-3.33-36	-1.31-35	-3.52-35	-8.16-35	-1.76-34	-3.68-34	-7.59-34	-1.57-33	-3.28-33	-7.09-33	-1.61-32
19	0.00+00	1.90-36	6.77-37	-3.16-36	-1.35-35	-3.73-35	-8.85-35	-1.96-34	-4.21-34	-9.01-34	-1.95-33	-4.37-33	-1.03-32	-2.66-32
18	0.00+00	2.32-36	1.11-36	-2.79-36	-1.35-35	-3.89-35	-9.47-35	-2.15-34	-4.80-34	-1.08-33	-2.49-33	-6.08-33	-1.62-32	-5.09-32
17	0.00+00	2.86-36	1.71-36	-2.16-36	-1.32-35	-3.99-35	-1.00-34	-2.35-34	-5.48-34	-1.31-33	-3.30-33	-9.11-33	-2.96-32	-1.31-31
16	0.00+00	3.57-36	2.52-36	-1.21-36	-1.23-35	-4.01-35	-1.05-34	-2.56-34	-6.33-34	-1.64-33	-4.68-33	-1.57-32	-7.18-32	-7.15-31
15	0.00+00	4.50-36	3.62-36	1.67-37	-1.09-35	-3.94-35	-1.08-34	-2.80-34	-7.47-34	-2.19-33	-7.56-33	-3.57-32	-3.69-31	
14	0.00+00	5.75-36	5.16-36	2.19-36	-8.45-36	-3.72-35	-1.10-34	-3.04-34	-9.10-34	-3.23-33	-1.58-32	-1.68-31		
13	0.00+00	7.49-36	7.38-36	5.36-36	-3.96-36	-3.10-35	-1.02-34	-3.13-34	-1.11-33	-5.60-33	-6.28-32			
12	0.00+00	9.99-36	1.08-35	1.07-35	5.05-36	-1.36-35	-6.18-35	-2.09-34	-1.00-33	-1.23-32				
11	0.00+00	1.37-35	1.62-35	2.03-35	2.45-35	3.50-35	1.05-34	6.17-34	7.04-33					
10	0.00+00	1.95-35	2.54-35	3.90-35	7.00-35	1.85-34	8.93-34	1.04-32						
9	0.00+00	2.88-35	4.18-35	7.81-35	1.91-34	7.66-34	7.85-33							
8	0.00+00	4.51-35	7.40-35	1.73-34	6.04-34	4.99-33								
7	0.00+00	7.63-35	1.47-34	4.71-34	3.25-33									
6	0.00+00	1.49-34	3.72-34	2.33-33										
5	0.00+00	3.77-34	1.78-33											
4	0.00+00	1.83-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.71-34	-2.22-34	-2.78-34	-3.36-34	-3.96-34	-4.56-34	-5.17-34	-5.78-34	-6.41-34	-7.07-34	-7.59-34	-8.31-34	-9.10-34	-9.98-34
45	-2.61-34	-3.44-34	-4.38-34	-5.40-34	-6.49-34	-7.65-34	-8.88-34	-1.02-33	-1.17-33	-1.33-33	-1.48-33	-1.69-33	-1.94-33	-2.23-33
40	-4.32-34	-5.82-34	-7.59-34	-9.63-34	-1.20-33	-1.46-33	-1.76-33	-2.11-33	-2.53-33	-3.04-33	-3.60-33	-4.39-33	-5.43-33	-6.84-33
35	-8.03-34	-1.12-33	-1.53-33	-2.03-33	-2.65-33	-3.42-33	-4.41-33	-5.70-33	-7.44-33	-9.88-33	-1.32-32	-1.84-32	-2.70-32	-4.18-32
30	-1.80-33	-2.68-33	-3.92-33	-5.67-33	-8.18-33	-1.19-32	-1.75-32	-2.68-32	-4.31-32	-7.45-32	-1.42-31	-3.29-31	-1.07-30	-7.69-30
29	-2.18-33	-3.32-33	-4.96-33	-7.37-33	-1.10-32	-1.65-32	-2.57-32	-4.18-32	-7.30-32	-1.43-31	-3.28-31	-1.07-30	-7.75-30	
28	-2.68-33	-4.17-33	-6.42-33	-9.84-33	-1.52-32	-2.41-32	-3.98-32	-7.05-32	-1.39-31	-3.28-31	-1.06-30	-7.71-30		
27	-3.36-33	-5.37-33	-8.52-33	-1.36-32	-2.20-32	-3.72-32	-6.68-32	-1.33-31	-3.18-31	-1.05-30	-7.61-30			
26	-4.29-33	-7.07-33	-1.17-32	-1.95-32	-3.38-32	-6.20-32	-1.26-31	-3.03-31	-1.01-30	-7.32-30				
25	-5.56-33	-9.53-33	-1.65-32	-2.94-32	-5.53-32	-1.14-31	-2.30-31	-5.43-31	-6.99-30					
24	-7.45-33	-1.34-32	-2.48-32	-4.81-32	-1.02-31	-2.55-31	-6.76-31	-6.59-30						
23	-1.04-32	-1.99-32	-4.01-32	-8.78-32	-2.25-31	-7.90-31	-6.05-30							
22	-1.51-32	-3.16-32	-7.19-32	-1.91-31	-6.87-31	-5.38-30								
21	-2.34-32	-5.55-32	-1.53-31	-5.69-31	-4.59-30									
20	-3.99-32	-1.15-31	-4.45-31	-3.71-30										
19	-7.98-32	-3.24-31	-2.81-30											
18	-2.16-31	-1.96-30												
17	-1.25-30													

H TE = 1.25+04 NE = 1.00+08 CASE B NC = 20

TOTAL RC = 2.230-13 4-2 RC = 2.607-14 4-2 EM = 1.065-25 2S RC = 7.525-14 2P RC = 1.478-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.39-04	2.57-04	1.11-04	5.73-05	3.34-05	2.12-05	1.42-05	1.00-05	7.34-06	5.53-06	4.26-06	3.36-06	2.69-06	2.19-06
45	1.15-03	3.53-04	1.52-04	7.86-05	4.59-05	2.91-05	1.95-05	1.38-05	1.01-05	7.58-06	5.85-06	4.61-06	3.69-06	3.01-06
40	1.64-03	5.03-04	2.16-04	1.12-04	6.54-05	4.14-05	2.78-05	1.96-05	1.43-05	1.08-05	8.33-06	6.56-06	5.26-06	4.28-06
35	2.45-03	7.52-04	3.23-04	1.67-04	9.76-05	6.18-05	4.16-05	2.93-05	2.14-05	1.61-05	1.24-05	9.78-06	7.84-06	6.37-06
30	3.89-03	1.19-03	5.13-04	2.66-04	1.55-04	9.81-05	6.59-05	4.64-05	3.39-05	2.55-05	1.97-05	1.55-05	1.24-05	1.01-05
29	4.31-03	1.32-03	5.68-04	2.94-04	1.71-04	1.09-04	7.30-05	5.14-05	3.75-05	2.82-05	2.18-05	1.71-05	1.37-05	1.11-05
28	4.79-03	1.47-03	6.31-04	3.26-04	1.90-04	1.20-04	8.10-05	5.70-05	4.16-05	3.13-05	2.41-05	1.90-05	1.52-05	1.24-05
27	5.34-03	1.64-03	7.03-04	3.64-04	2.12-04	1.34-04	9.02-05	6.35-05	4.64-05	3.49-05	2.69-05	2.11-05	1.69-05	1.37-05
26	5.97-03	1.83-03	7.86-04	4.07-04	2.37-04	1.50-04	1.01-04	7.10-05	5.18-05	3.90-05	3.00-05	2.36-05	1.89-05	1.53-05
25	6.70-03	2.06-03	8.83-04	4.57-04	2.66-04	1.68-04	1.13-04	7.97-05	5.82-05	4.37-05	3.37-05	2.65-05	2.12-05	1.72-05
24	7.56-03	2.32-03	9.95-04	5.15-04	3.00-04	1.90-04	1.28-04	8.98-05	6.55-05	4.93-05	3.79-05	2.98-05	2.38-05	1.93-05
23	8.56-03	2.62-03	1.13-03	5.83-04	3.40-04	2.15-04	1.44-04	1.02-04	7.41-05	5.57-05	4.29-05	3.37-05	2.69-05	2.18-05
22	9.74-03	2.99-03	1.28-03	6.63-04	3.86-04	2.44-04	1.64-04	1.15-04	8.42-05	6.33-05	4.87-05	3.82-05	3.05-05	2.47-05
21	1.11-02	3.41-03	1.46-03	7.57-04	4.41-04	2.79-04	1.87-04	1.32-04	9.61-05	7.21-05	5.55-05	4.35-05	3.47-05	2.80-05
20	1.28-02	3.91-03	1.68-03	8.68-04	5.05-04	3.19-04	2.15-04	1.51-04	1.10-04	8.25-05	6.34-05	4.96-05	3.95-05	3.19-05
19	1.47-02	4.50-03	1.93-03	9.99-04	5.82-04	3.68-04	2.47-04	1.73-04	1.26-04	9.47-05	7.27-05	5.69-05	4.52-05	3.63-05
18	1.70-02	5.20-03	2.23-03	1.15-03	6.72-04	4.25-04	2.85-04	2.00-04	1.46-04	1.09-04	8.36-05	6.53-05	5.16-05	4.12-05
17	1.97-02	6.04-03	2.59-03	1.34-03	7.79-04	4.92-04	3.30-04	2.32-04	1.68-04	1.26-04	9.63-05	7.49-05	5.88-05	4.61-05
16	2.29-02	7.02-03	3.01-03	1.56-03	9.06-04	5.72-04	3.83-04	2.69-04	1.95-04	1.46-04	1.11-04	8.55-05	6.60-05	4.87-05
15	2.68-02	8.20-03	3.52-03	1.82-03	1.06-03	6.66-04	4.46-04	3.12-04	2.26-04	1.68-04	1.27-04	9.65-05	7.01-05	
14	3.14-02	9.61-03	4.12-03	2.13-03	1.24-03	7.79-04	5.21-04	3.64-04	2.63-04	1.94-04	1.44-04	1.03-04		
13	3.71-02	1.14-02	4.87-03	2.52-03	1.46-03	9.20-04	6.14-04	4.27-04	3.06-04	2.22-04	1.55-04			
12	4.46-02	1.37-02	5.86-03	3.02-03	1.75-03	1.10-03	7.33-04	5.07-04	3.57-04	2.44-04				
11	5.51-02	1.69-02	7.23-03	3.73-03	2.16-03	1.35-03	8.94-04	6.08-04	4.04-04					
10	7.01-02	2.15-02	9.20-03	4.74-03	2.74-03	1.71-03	1.11-03	7.12-04						
9	9.23-02	2.83-02	1.21-02	6.25-03	3.60-03	2.21-03	1.36-03							
8	1.26-01	3.87-02	1.67-02	8.57-03	4.88-03	2.83-03								
7	1.83-01	5.58-02	2.40-02	1.23-02	6.64-03									
6	2.84-01	8.59-02	3.69-02	1.80-02										
5	4.91-01	1.46-01	6.01-02											
4	1.00+00	2.78-01												
3	2.69+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.81-06	1.51-06	1.27-06	1.08-06	9.27-07	8.01-07	6.97-07	6.10-07	5.37-07	4.75-07	4.22-07	3.77-07	3.38-07	3.04-07
45	2.48-06	2.07-06	1.74-06	1.48-06	1.27-06	1.10-06	9.55-07	8.35-07	7.35-07	6.50-07	5.77-07	5.15-07	4.62-07	4.15-07
40	3.53-06	2.94-06	2.48-06	2.11-06	1.81-06	1.56-06	1.36-06	1.19-06	1.04-06	9.21-07	8.18-07	7.29-07	6.53-07	5.86-07
35	5.25-06	4.38-06	3.69-06	3.13-06	2.68-06	2.32-06	2.01-06	1.76-06	1.54-06	1.36-06	1.21-06	1.07-06	9.57-07	8.56-07
30	8.30-06	6.91-06	5.82-06	4.94-06	4.22-06	3.64-06	3.15-06	2.74-06	2.40-06	2.10-06	1.84-06	1.61-06	1.39-06	1.14-06
29	9.17-06	7.64-06	6.42-06	5.45-06	4.66-06	4.03-06	3.47-06	3.02-06	2.63-06	2.30-06	2.00-06	1.72-06	1.40-06	
28	1.02-05	8.46-06	7.11-06	6.03-06	5.15-06	4.43-06	3.83-06	3.32-06	2.88-06	2.50-06	2.14-06	1.73-06		
27	1.13-05	9.41-06	7.90-06	6.69-06	5.71-06	4.90-06	4.23-06	3.65-06	3.15-06	2.68-06	2.16-06			
26	1.26-05	1.05-05	8.80-06	7.45-06	6.35-06	5.43-06	4.67-06	4.00-06	3.39-06	2.72-06				
25	1.41-05	1.17-05	9.84-06	8.31-06	7.07-06	6.03-06	5.13-06	4.33-06	3.45-06					
24	1.59-05	1.32-05	1.10-05	9.29-06	7.87-06	6.66-06	5.58-06	4.42-06						
23	1.79-05	1.48-05	1.24-05	1.04-05	8.73-06	7.26-06	5.72-06							
22	2.02-05	1.67-05	1.39-05	1.16-05	9.56-06	7.49-06								
21	2.29-05	1.89-05	1.56-05	1.27-05	9.90-06									
20	2.59-05	2.12-05	1.72-05	1.33-05										
19	2.93-05	2.35-05	1.80-05											
18	3.27-05	2.47-05												
17	3.44-05													

H TE = 1.25+04 NE = 1.00+08 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.80-31	7.57-38	-6.20-38	-4.30-37	-1.23-36	-2.74-36	-5.32-36	-9.44-36	-1.55-35	-2.38-35	-3.37-35	-4.43-35	-5.41-35	-6.21-35
45	6.60-31	1.04-37	-8.63-38	-5.98-37	-1.72-36	-3.80-36	-7.50-36	-1.34-35	-2.22-35	-3.43-35	-4.92-35	-6.53-35	-8.08-35	-9.41-35
40	9.42-31	1.48-37	-1.25-37	-8.65-37	-2.50-36	-5.62-36	-1.11-35	-2.00-35	-3.35-35	-5.24-35	-7.62-35	-1.03-34	-1.30-34	-1.54-34
35	1.41-30	2.22-37	-1.91-37	-1.32-36	-3.85-36	-8.74-36	-1.74-35	-3.19-35	-5.44-35	-8.67-35	-1.29-34	-1.78-34	-2.31-34	-2.84-34
30	2.25-30	3.55-37	-3.13-37	-2.17-36	-6.39-36	-1.47-35	-3.00-35	-5.61-35	-9.83-35	-1.62-34	-2.49-34	-3.59-34	-4.87-34	-6.32-34
29	2.49-30	3.94-37	-3.48-37	-2.42-36	-7.15-36	-1.66-35	-3.39-35	-6.38-35	-1.13-34	-1.87-34	-2.90-34	-4.23-34	-5.82-34	-7.67-34
28	2.77-30	4.39-37	-3.89-37	-2.71-36	-8.04-36	-1.87-35	-3.85-35	-7.30-35	-1.30-34	-2.17-34	-3.42-34	-5.05-34	-7.05-34	-9.44-34
27	3.10-30	4.91-37	-4.35-37	-3.04-36	-9.08-36	-2.12-35	-4.40-35	-8.41-35	-1.51-34	-2.55-34	-4.07-34	-6.09-34	-8.66-34	-1.18-33
26	3.47-30	5.52-37	-4.89-37	-3.44-36	-1.03-35	-2.43-35	-5.06-35	-9.76-35	-1.77-34	-3.03-34	-4.90-34	-7.46-34	-1.08-33	-1.51-33
25	3.91-30	6.24-37	-5.50-37	-3.90-36	-1.17-35	-2.79-35	-5.86-35	-1.14-34	-2.09-34	-3.64-34	-5.98-34	-9.29-34	-1.38-33	-1.98-33
24	4.43-30	7.10-37	-6.20-37	-4.44-36	-1.35-35	-3.22-35	-6.84-35	-1.35-34	-2.51-34	-4.42-34	-7.41-34	-1.18-33	-1.80-33	-2.67-33
23	5.05-30	8.13-37	-6.99-37	-5.08-36	-1.55-35	-3.74-35	-8.04-35	-1.61-34	-3.03-34	-5.46-34	-9.36-34	-1.53-33	-2.41-33	-3.73-33
22	5.79-30	9.38-37	-7.87-37	-5.83-36	-1.80-35	-4.39-35	-9.54-35	-1.93-34	-3.72-34	-6.85-34	-1.21-33	-2.04-33	-3.34-33	-5.44-33
21	6.67-30	1.09-36	-8.83-37	-6.72-36	-2.10-35	-5.17-35	-1.14-34	-2.36-34	-4.64-34	-8.78-34	-1.60-33	-2.81-33	-4.84-33	-8.42-33
20	7.75-30	1.29-36	-9.67-37	-7.72-36	-2.45-35	-6.12-35	-1.37-34	-2.90-34	-5.86-34	-1.14-33	-2.17-33	-4.01-33	-7.38-33	-1.40-32
19	9.08-30	1.54-36	-1.05-36	-8.91-36	-2.87-35	-7.30-35	-1.67-34	-3.63-34	-7.57-34	-1.54-33	-3.07-33	-6.06-33	-1.22-32	-2.61-32
18	1.07-29	1.86-36	-1.10-36	-1.02-35	-3.37-35	-8.76-35	-2.06-34	-4.60-34	-9.99-34	-2.14-33	-4.55-33	-9.82-33	-2.24-32	-5.81-32
17	1.28-29	2.29-36	-1.07-36	-1.17-35	-3.96-35	-1.05-34	-2.55-34	-5.93-34	-1.36-33	-3.10-33	-7.22-33	-1.77-32	-4.87-32	-1.79-31
16	1.59-29	2.87-36	-9.03-37	-1.31-35	-4.62-35	-1.27-34	-3.19-34	-7.78-34	-1.90-33	-4.75-33	-1.26-32	-3.73-32	-1.46-31	-1.20-30
15	1.89-29	3.68-36	-4.74-37	-1.44-35	-5.32-35	-1.52-34	-4.01-34	-1.00-33	-2.78-33	-7.90-33	-2.54-32	-1.07-31	-9.38-31	
14	2.35-29	4.82-36	3.88-37	-1.51-35	-6.02-35	-1.81-34	-5.07-34	-1.44-33	-4.35-33	-1.50-32	-6.87-32	-6.52-31		
13	2.98-29	6.45-36	1.91-36	-1.50-35	-6.68-35	-2.14-34	-6.52-34	-2.09-33	-7.66-33	-3.76-32	-3.88-31			
12	3.84-29	8.81-36	4.41-36	-1.37-35	-7.31-35	-2.57-34	-8.78-34	-3.39-33	-1.75-32	-1.94-31				
11	5.10-29	1.23-35	8.38-36	-1.08-35	-8.04-35	-3.22-34	-1.32-33	-7.10-33	-8.20-32					
10	6.97-29	1.78-35	1.50-35	-4.93-36	-8.99-45	-4.49-34	-2.52-33	-3.00-32						
9	9.92-29	2.68-35	2.72-35	9.28-36	-9.96-35	-7.04-34	-8.65-33							
8	1.49-28	4.31-35	5.29-35	5.16-35	-3.69-35	-1.05-33								
7	2.40-28	7.56-35	1.15-34	2.20-34	1.05-33									
6	4.32-28	1.52-34	3.19-34	1.55-33										
5	9.24-28	3.88-34	1.61-33											
4	2.76-27	1.84-33												
3	2.00-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-6.78-35	-7.11-35	-7.19-35	-7.05-35	-6.67-35	-5.84-35	-4.94-35	-3.71-35	-2.11-35	-5.29-37	2.56-35	5.90-35	1.02-34	1.56-34
45	-1.04-34	-1.12-34	-1.16-34	-1.16-34	-1.14-34	-1.04-34	-9.35-35	-7.76-35	-5.51-35	-2.41-35	1.78-35	7.47-35	1.52-34	2.58-34
40	-1.75-34	-1.93-34	-2.06-34	-2.16-34	-2.21-34	-2.15-34	-2.08-34	-1.93-34	-1.66-34	-1.22-34	-5.33-35	5.23-35	2.16-34	4.71-34
35	-3.36-34	-3.85-34	-4.33-34	-4.79-34	-5.26-34	-5.58-34	-6.00-34	-6.38-34	-6.65-34	-6.70-34	-6.32-34	-4.99-34	-1.55-34	6.53-34
30	-7.94-34	-9.79-34	-1.20-33	-1.47-33	-1.81-33	-2.22-33	-2.89-33	-3.78-33	-5.25-33	-7.78-33	-1.28-32	-2.45-32	-6.30-32	-3.43-31
29	-9.81-34	-1.23-33	-1.55-33	-1.99-33	-2.50-33	-3.21-33	-4.35-33	-6.20-33	-9.49-33	-1.61-32	-3.27-32	-9.10-32	-5.48-31	
28	-1.23-33	-1.59-33	-2.05-33	-2.68-33	-3.57-33	-4.85-33	-7.05-33	-1.10-32	-1.93-32	-4.02-32	-1.17-31	-7.47-31		
27	-1.58-33	-2.10-33	-2.80-33	-3.81-33	-5.37-33	-7.80-33	-1.24-32	-2.21-32	-4.72-32	-1.40-31	-9.20-31			
26	-2.08-33	-2.85-33	-3.97-33	-5.69-33	-8.57-33	-1.36-32	-2.47-32	-5.36-32	-1.62-31	-1.08-30				
25	-2.81-33	-4.02-33	-5.89-33	-9.03-33	-1.49-32	-2.68-32	-5.91-32	-1.81-31	-1.24-30					
24	-3.95-33	-5.94-33	-9.29-33	-1.56-32	-2.90-32	-6.37-32	-1.98-31	-1.37-30						
23	-5.80-33	-9.32-33	-1.59-32	-3.02-32	-6.82-32	-2.12-31	-1.48-30							
22	-9.04-33	-1.58-32	-3.06-32	-7.04-32	-2.24-31	-1.57-30								
21	-1.53-32	-3.03-32	-7.09-32	-2.29-31	-1.62-30									
20	-2.86-32	-6.87-32	-2.26-31	-1.63-30										
19	-6.48-32	-2.19-31	-1.61-30											
18	-2.03-31	-1.54-30												
17	-1.40-30													

H TE = 1.25+04 NE = 1.00+09 CASE B NC = 20

TOTAL RC = 2.307-13 4-2 RC = 2.754-14 4-2 EM = 1.125-25 2S RC = 7.621-14 2P RC = 1.545-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.94-04	2.44-04	1.05-04	5.43-05	3.16-05	2.00-05	1.35-05	9.51-06	6.95-06	5.23-06	4.04-06	3.18-06	2.55-06	2.08-06
45	1.09-03	3.35-04	1.44-04	7.45-05	4.35-05	2.75-05	1.85-05	1.30-05	9.54-06	7.18-06	5.54-06	4.37-06	3.50-06	2.85-06
40	1.56-03	4.77-04	2.05-04	1.06-04	6.19-05	3.92-05	2.64-05	1.86-05	1.36-05	1.04-05	7.89-06	6.22-06	4.98-06	4.05-06
35	2.33-03	7.14-04	3.07-04	1.59-04	9.26-05	5.86-05	3.94-05	2.78-05	2.03-05	1.53-05	1.18-05	9.28-06	7.43-06	6.05-06
30	3.70-03	1.14-03	4.88-04	2.53-04	1.47-04	9.33-05	6.27-05	4.42-05	3.23-05	2.43-05	1.87-05	1.47-05	1.18-05	9.59-06
29	4.10-03	1.26-03	5.41-04	2.80-04	1.63-04	1.03-04	6.95-05	4.89-05	3.57-05	2.69-05	2.07-05	1.63-05	1.31-05	1.06-05
28	4.56-03	1.40-03	6.01-04	3.11-04	1.81-04	1.15-04	7.72-05	5.44-05	3.97-05	2.99-05	2.30-05	1.81-05	1.45-05	1.18-05
27	5.09-03	1.56-03	6.71-04	3.47-04	2.02-04	1.28-04	8.61-05	6.06-05	4.43-05	3.33-05	2.57-05	2.02-05	1.62-05	1.31-05
26	5.71-03	1.75-03	7.52-04	3.89-04	2.27-04	1.44-04	9.65-05	6.79-05	4.96-05	3.73-05	2.87-05	2.26-05	1.81-05	1.47-05
25	6.43-03	1.97-03	8.46-04	4.38-04	2.55-04	1.62-04	1.09-04	7.64-05	5.58-05	4.19-05	3.23-05	2.54-05	2.03-05	1.65-05
24	7.27-03	2.23-03	9.57-04	4.95-04	2.89-04	1.83-04	1.23-04	8.64-05	6.30-05	4.74-05	3.65-05	2.87-05	2.29-05	1.86-05
23	8.27-03	2.53-03	1.09-03	5.63-04	3.28-04	2.08-04	1.39-04	9.81-05	7.16-05	5.38-05	4.14-05	3.25-05	2.60-05	2.11-05
22	9.45-03	2.90-03	1.24-03	6.44-04	3.75-04	2.37-04	1.59-04	1.12-04	8.17-05	6.14-05	4.72-05	3.71-05	2.96-05	2.40-05
21	1.09-02	3.33-03	1.43-03	7.40-04	4.31-04	2.73-04	1.83-04	1.29-04	9.39-05	7.05-05	5.42-05	4.25-05	3.39-05	2.74-05
20	1.26-02	3.86-03	1.66-03	8.56-04	4.99-04	3.15-04	2.12-04	1.49-04	1.08-04	8.14-05	6.25-05	4.90-05	3.90-05	3.14-05
19	1.47-02	4.50-03	1.93-03	9.98-04	5.81-04	3.67-04	2.46-04	1.73-04	1.26-04	9.46-05	7.26-05	5.68-05	4.51-05	3.62-05
18	1.72-02	5.28-03	2.27-03	1.17-03	6.82-04	4.31-04	2.89-04	2.03-04	1.48-04	1.11-04	8.47-05	6.61-05	5.23-05	4.17-05
17	2.04-02	6.25-03	2.68-03	1.39-03	8.06-04	5.09-04	3.41-04	2.39-04	1.74-04	1.30-04	9.95-05	7.73-05	6.07-05	4.76-05
16	2.44-02	7.46-03	3.20-03	1.65-03	9.61-04	6.06-04	4.06-04	2.85-04	2.07-04	1.54-04	1.17-04	9.05-05	6.98-05	5.15-05
15	2.93-02	8.97-03	3.84-03	1.99-03	1.15-03	7.28-04	4.87-04	3.41-04	2.47-04	1.83-04	1.38-04	1.05-04	7.62-05	
14	3.55-02	1.09-02	4.66-03	2.40-03	1.40-03	8.79-04	5.87-04	4.10-04	2.96-04	2.18-04	1.62-04	1.15-04		
13	4.33-02	1.32-02	5.67-03	2.92-03	1.70-03	1.07-03	7.11-04	4.94-04	3.54-04	2.56-04	1.79-04			
12	5.30-02	1.62-02	6.93-03	3.57-03	2.07-03	1.30-03	8.62-04	5.95-04	4.18-04	2.85-04				
11	6.51-02	1.99-02	8.50-03	4.37-03	2.53-03	1.58-03	1.04-03	7.06-04	4.68-04					
10	8.04-02	2.45-02	1.05-02	5.38-03	3.10-03	1.92-03	1.25-03	7.96-04						
9	1.02-01	3.10-02	1.32-02	6.76-03	3.86-03	2.36-03	1.44-03							
8	1.35-01	4.10-02	1.74-02	8.85-03	4.98-03	2.86-03								
7	1.90-01	5.76-02	2.44-02	1.22-02	6.48-03									
6	2.90-01	8.73-02	3.64-02	1.72-02										
5	4.94-01	1.45-01	5.70-02											
4	1.00+00	2.64-01												
3	2.62+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.71-06	1.43-06	1.20-06	1.02-06	8.78-07	7.59-07	6.60-07	5.78-07	5.08-07	4.50-07	4.00-07	3.57-07	3.20-07	2.88-07
45	2.35-06	1.96-06	1.65-06	1.40-06	1.20-06	1.04-06	9.04-07	7.91-07	6.96-07	6.16-07	5.47-07	4.88-07	4.37-07	3.93-07
40	3.34-06	2.79-06	2.35-06	2.00-06	1.71-06	1.48-06	1.28-06	1.12-06	9.88-07	8.73-07	7.75-07	6.91-07	6.18-07	5.55-07
35	4.98-06	4.15-06	3.50-06	2.97-06	2.55-06	2.20-06	1.91-06	1.67-06	1.46-06	1.29-06	1.15-06	1.02-06	9.08-07	8.12-07
30	7.89-06	6.58-06	5.53-06	4.69-06	4.02-06	3.46-06	3.00-06	2.61-06	2.28-06	2.00-06	1.75-06	1.54-06	1.33-06	1.08-06
29	8.73-06	7.27-06	6.11-06	5.19-06	4.43-06	3.82-06	3.30-06	2.87-06	2.50-06	2.19-06	1.90-06	1.64-06	1.33-06	
28	9.69-06	8.07-06	6.78-06	5.75-06	4.91-06	4.22-06	3.65-06	3.16-06	2.75-06	2.38-06	2.04-06	1.65-06		
27	1.08-05	8.98-06	7.54-06	6.39-06	5.45-06	4.68-06	4.03-06	3.49-06	3.01-06	2.56-06	2.06-06			
26	1.21-05	1.00-05	8.42-06	7.13-06	6.07-06	5.20-06	4.46-06	3.83-06	3.24-06	2.60-06				
25	1.35-05	1.13-05	9.43-06	7.97-06	6.77-06	5.78-06	4.92-06	4.15-06	3.31-06					
24	1.53-05	1.27-05	1.06-05	8.94-06	7.57-06	6.40-06	5.36-06	4.25-06						
23	1.73-05	1.43-05	1.20-05	1.00-05	8.43-06	7.01-06	5.53-06							
22	1.96-05	1.62-05	1.35-05	1.12-05	9.28-06	7.27-06								
21	2.24-05	1.84-05	1.52-05	1.25-05	9.68-06									
20	2.56-05	2.09-05	1.70-05	1.31-05										
19	2.92-05	2.35-05	1.79-05											
18	3.31-05	2.50-05												
17	3.55-05													

H TE = 1.25+04 NE = 1.00+09 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.03-32	5.22-38	-1.01-37	-4.57-37	-1.18-36	-2.47-36	-4.44-36	-6.86-36	-8.97-36	-9.94-36	-9.47-36	-7.58-36	-4.39-36	4.97-38
45	1.10-31	7.16-38	-1.40-37	-6.35-37	-1.65-36	-3.46-36	-6.27-36	-9.75-36	-1.29-35	-1.44-35	-1.40-35	-1.15-35	-7.05-36	-7.28-37
40	1.57-31	1.02-37	-2.03-37	-9.21-37	-2.40-36	-5.08-36	-9.28-36	-1.46-35	-1.95-35	-2.23-35	-2.20-35	-1.87-35	-1.24-35	-2.99-36
35	2.36-31	1.52-37	-3.09-37	-1.41-36	-3.70-36	-7.93-36	-1.47-35	-2.35-35	-3.20-35	-3.74-35	-3.82-35	-3.41-35	-2.49-35	-1.01-35
30	3.76-31	2.42-37	-5.08-37	-2.33-36	-6.19-36	-1.35-35	-2.55-35	-4.18-35	-5.87-35	-7.13-35	-7.67-35	-7.37-35	-6.12-35	-3.71-35
29	4.16-31	2.68-37	-5.68-37	-2.60-36	-6.95-36	-1.52-35	-2.89-35	-4.77-35	-6.75-35	-8.29-35	-9.04-35	-8.86-35	-7.58-35	-4.94-35
28	4.63-31	2.98-37	-6.37-37	-2.92-36	-7.84-36	-1.72-35	-3.29-35	-5.48-35	-7.83-35	-9.73-35	-1.08-34	-1.08-34	-9.53-35	-6.68-35
27	5.17-31	3.32-37	-7.17-37	-3.30-36	-8.89-36	-1.97-35	-3.78-35	-6.34-35	-9.16-35	-1.15-34	-1.30-34	-1.33-34	-1.22-34	-9.18-35
26	5.80-31	3.73-37	-8.12-37	-3.75-36	-1.01-35	-2.26-35	-4.38-35	-7.41-35	-1.08-34	-1.38-34	-1.59-34	-1.67-34	-1.59-34	-1.29-34
25	6.54-31	4.20-37	-9.25-37	-4.28-36	-1.16-35	-2.61-35	-5.11-35	-8.74-35	-1.29-34	-1.68-34	-1.97-34	-2.13-34	-2.12-34	-1.85-34
24	7.41-31	4.75-37	-1.06-36	-4.92-36	-1.35-35	-3.04-35	-6.02-35	-1.04-34	-1.57-34	-2.08-34	-2.50-34	-2.79-34	-2.90-34	-2.73-34
23	8.44-31	5.41-37	-1.22-36	-5.69-36	-1.57-35	-3.58-35	-7.16-35	-1.26-34	-1.93-34	-2.61-34	-3.23-34	-3.74-34	-4.10-34	-4.19-34
22	9.67-31	6.19-37	-1.42-36	-6.64-36	-1.85-35	-4.26-35	-8.63-35	-1.54-34	-2.41-34	-3.35-34	-4.28-34	-5.18-34	-6.03-34	-6.73-34
21	1.11-30	7.15-37	-1.66-36	-7.81-36	-2.19-35	-5.12-35	-1.06-34	-1.92-34	-3.08-34	-4.41-34	-5.86-34	-7.46-34	-9.30-34	-1.15-33
20	1.30-30	8.32-37	-1.95-36	-9.27-36	-2.63-35	-6.24-35	-1.31-34	-2.44-34	-4.02-34	-5.97-34	-8.31-34	-1.12-33	-1.52-33	-2.11-33
19	1.52-30	9.77-37	-2.32-36	-1.11-35	-3.20-35	-7.72-35	-1.66-34	-3.17-34	-5.41-34	-8.39-34	-1.24-33	-1.81-33	-2.72-33	-4.39-33
18	1.79-30	1.16-36	-2.78-36	-1.35-35	-3.95-35	-9.72-35	-2.14-34	-4.24-34	-7.54-34	-1.24-33	-1.96-33	-3.16-33	-5.47-33	-1.10-32
17	2.14-30	1.40-36	-3.36-36	-1.65-35	-4.94-35	-1.25-34	-2.84-34	-5.85-34	-1.10-33	-1.93-33	-3.37-33	-6.21-33	-1.33-32	-3.84-32
16	2.59-30	1.71-36	-4.09-36	-2.05-35	-6.28-35	-1.64-34	-3.87-34	-8.43-34	-1.70-33	-3.27-33	-6.51-33	-1.47-32	-4.49-32	-2.98-31
15	3.16-30	2.14-36	-4.99-36	-2.58-35	-8.13-35	-2.20-34	-5.49-34	-1.28-33	-2.82-33	-6.21-33	-1.51-32	-4.86-32	-3.37-31	
14	3.93-30	2.75-36	-6.07-36	-3.27-35	-1.07-34	-3.05-34	-8.13-34	-2.08-33	-5.23-33	-1.40-32	-4.86-32	-3.55-31		
13	4.97-30	3.67-36	-7.26-36	-4.17-35	-1.44-34	-4.37-34	-1.28-33	-3.72-33	-1.14-32	-4.37-32	-3.43-31			
12	6.42-30	5.10-36	-8.33-36	-5.30-35	-1.95-34	-6.50-34	-2.16-33	-7.73-33	-3.39-32	-2.94-31				
11	8.51-30	7.48-36	-8.67-36	-6.61-35	-2.67-34	-1.01-33	-4.13-33	-2.11-32	-2.11-31					
10	1.16-29	1.15-35	-7.12-36	-7.94-35	-3.70-34	-1.71-33	-9.96-33	-1.17-31						
9	1.66-29	1.86-35	-1.93-36	-9.26-35	-5.40-34	-3.54-33	-4.68-32							
8	2.49-29	3.14-35	9.99-36	-1.10-34	-9.69-34	-1.43-32								
7	4.02-29	5.75-35	4.00-35	-1.44-34	-3.30-33									
6	7.22-29	1.21-34	1.44-34	-1.79-34										
5	1.54-28	3.30-34	8.15-34											
4	4.62-28	1.61-33												
3	3.35-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.76-36	1.29-35	2.16-35	3.21-35	4.49-35	6.07-35	7.95-35	1.02-34	1.30-34	1.60-34	2.06-34	2.57-34	3.20-34	3.99-34
45	7.61-36	1.82-35	3.15-35	4.81-35	6.86-35	9.48-35	1.27-34	1.67-34	2.18-34	2.82-34	3.64-34	4.70-34	6.07-34	7.88-34
40	9.91-36	2.69-35	4.90-35	7.76-35	1.15-34	1.68-34	2.27-34	3.10-34	4.20-34	5.70-34	7.74-34	1.06-33	1.46-33	2.04-33
35	1.19-35	4.47-35	8.32-35	1.40-34	2.19-34	3.32-34	4.90-34	7.16-34	1.05-33	1.56-33	2.35-33	3.65-33	5.89-33	1.00-32
30	2.64-36	6.46-35	1.60-34	3.07-34	5.40-34	9.24-34	1.56-33	2.68-33	4.81-33	9.21-33	1.96-32	4.97-32	1.75-31	1.36-30
29	-4.13-36	6.90-35	1.86-34	3.73-34	6.81-34	1.22-33	2.16-33	3.95-33	7.69-33	1.66-32	4.26-32	1.51-31	1.19-30	
28	-1.52-35	7.18-35	2.17-34	4.60-34	8.81-34	1.66-33	3.14-33	6.25-33	1.37-32	3.57-32	1.28-31	1.01-30		
27	-3.33-35	7.10-35	2.54-34	5.79-34	1.18-33	2.38-33	4.92-33	1.11-32	2.93-32	1.07-31	8.61-31			
26	-6.35-35	6.18-35	2.97-34	7.47-34	1.65-33	3.65-33	8.55-33	2.32-32	8.63-32	7.03-31				
25	-1.15-34	3.57-35	3.44-34	9.96-34	2.45-33	6.22-33	1.77-32	6.76-32	5.62-31					
24	-2.04-34	-2.81-35	3.84-34	1.38-33	3.99-33	1.25-32	5.03-32	4.32-31						
23	-3.69-34	-1.79-34	3.72-34	2.00-33	7.91-33	3.39-32	3.11-31							
22	-6.93-34	-5.53-34	1.38-34	3.04-33	1.85-32	1.94-31								
21	-1.39-33	-1.56-33	-1.06-33	4.73-33	9.54-32									
20	-3.05-33	-4.72-33	-7.75-33	-1.42-33										
19	-8.10-33	-1.95-32	-9.13-32											
18	-2.98-32	-1.72-31												
17	-2.41-31													

B TE = 1.25+04 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 2.451-13 4-2 RC = 2.921-14 4-2 EM = 1.194-25 2S RC = 6.807-14 2P RC = 1.771-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.49-04	2.30-04	9.87-05	5.11-05	2.98-05	1.89-05	1.27-05	8.96-06	6.55-06	4.93-06	3.81-06	3.00-06	2.40-06	1.96-06
45	1.03-03	3.15-04	1.36-04	7.02-05	4.10-05	2.59-05	1.75-05	1.23-05	8.99-06	6.77-06	5.22-06	4.11-06	3.30-06	2.68-06
40	1.47-03	4.50-04	1.93-04	1.00-04	5.84-05	3.70-05	2.49-05	1.75-05	1.28-05	9.65-06	7.44-06	5.86-06	4.70-06	3.82-06
35	2.19-03	6.73-04	2.89-04	1.50-04	8.73-05	5.53-05	3.72-05	2.62-05	1.91-05	1.44-05	1.11-05	8.75-06	7.01-06	5.70-06
30	3.49-03	1.07-03	4.60-04	2.38-04	1.39-04	8.80-05	5.92-05	4.17-05	3.04-05	2.29-05	1.77-05	1.39-05	1.11-05	9.04-06
29	3.87-03	1.19-03	5.10-04	2.64-04	1.54-04	9.75-05	6.55-05	4.62-05	3.37-05	2.54-05	1.95-05	1.54-05	1.23-05	1.00-05
28	4.31-03	1.32-03	5.67-04	2.94-04	1.71-04	1.08-04	7.29-05	5.13-05	3.75-05	2.82-05	2.17-05	1.71-05	1.37-05	1.11-05
27	4.81-03	1.47-03	6.33-04	3.28-04	1.91-04	1.21-04	8.13-05	5.72-05	4.18-05	3.14-05	2.42-05	1.91-05	1.52-05	1.24-05
26	5.39-03	1.65-03	7.10-04	3.67-04	2.14-04	1.36-04	9.11-05	6.41-05	4.68-05	3.52-05	2.71-05	2.13-05	1.71-05	1.39-05
25	6.07-03	1.86-03	8.00-04	4.14-04	2.41-04	1.53-04	1.03-04	7.22-05	5.27-05	3.96-05	3.05-05	2.40-05	1.92-05	1.56-05
24	6.87-03	2.11-03	9.05-04	4.68-04	2.73-04	1.73-04	1.16-04	8.17-05	5.96-05	4.48-05	3.45-05	2.71-05	2.17-05	1.76-05
23	7.82-03	2.40-03	1.03-03	5.33-04	3.10-04	1.96-04	1.32-04	9.28-05	6.77-05	5.09-05	3.92-05	3.08-05	2.46-05	1.99-05
22	8.95-03	2.74-03	1.18-03	6.10-04	3.55-04	2.25-04	1.51-04	1.06-04	7.74-05	5.82-05	4.47-05	3.51-05	2.80-05	2.27-05
21	1.03-02	3.16-03	1.36-03	7.02-04	4.09-04	2.59-04	1.74-04	1.22-04	8.90-05	6.69-05	5.14-05	4.03-05	3.21-05	2.60-05
20	1.20-02	3.67-03	1.57-03	8.14-04	4.74-04	3.00-04	2.01-04	1.41-04	1.03-04	7.74-05	5.94-05	4.66-05	3.71-05	2.99-05
19	1.40-02	4.29-03	1.84-03	9.52-04	5.54-04	3.50-04	2.35-04	1.65-04	1.20-04	9.01-05	6.92-05	5.41-05	4.30-05	3.45-05
18	1.65-02	5.06-03	2.17-03	1.12-03	6.53-04	4.12-04	2.77-04	1.94-04	1.41-04	1.06-04	8.11-05	6.33-05	5.01-05	3.99-05
17	1.97-02	6.02-03	2.58-03	1.33-03	7.76-04	4.90-04	3.29-04	2.31-04	1.68-04	1.25-04	9.58-05	7.44-05	5.84-05	4.58-05
16	2.37-02	7.24-03	3.11-03	1.60-03	9.33-04	5.89-04	3.94-04	2.76-04	2.01-04	1.50-04	1.14-04	8.78-05	6.78-05	4.99-05
15	2.88-02	8.81-03	3.78-03	1.95-03	1.13-03	7.15-04	4.78-04	3.35-04	2.42-04	1.80-04	1.36-04	1.03-04	7.48-05	
14	3.55-02	1.09-02	4.66-03	2.40-03	1.39-03	8.78-04	5.87-04	4.10-04	2.95-04	2.18-04	1.62-04	1.15-04		
13	4.44-02	1.36-02	5.82-03	3.00-03	1.74-03	1.09-03	7.29-04	5.07-04	3.63-04	2.63-04	1.84-04			
12	5.64-02	1.72-02	7.38-03	3.80-03	2.20-03	1.38-03	9.15-04	6.32-04	4.44-04	3.03-04				
11	7.27-02	2.22-02	9.49-03	4.88-03	2.82-03	1.76-03	1.16-03	7.86-04	5.20-04					
10	9.49-02	2.89-02	1.23-02	6.33-03	3.64-03	2.26-03	1.46-03	9.33-04						
9	1.25-01	3.80-02	1.62-02	8.25-03	4.71-03	2.87-03	1.75-03							
8	1.64-01	4.98-02	2.11-02	1.07-02	6.01-03	3.45-03								
7	2.19-01	6.62-02	2.79-02	1.39-02	7.34-03									
6	3.14-01	9.42-02	3.96-02	1.83-02										
5	5.11-01	1.50-01	5.86-02											
4	1.00+00	2.72-01												
3	2.65+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.61-06	1.35-06	1.13-06	9.65-07	8.28-07	7.15-07	6.22-07	5.45-07	4.79-07	4.24-07	3.77-07	3.36-07	3.01-07	2.71-07
45	2.21-06	1.85-06	1.56-06	1.32-06	1.13-06	9.80-07	8.52-07	7.46-07	6.56-07	5.80-07	5.16-07	4.60-07	4.12-07	3.71-07
40	3.15-06	2.63-06	2.21-06	1.88-06	1.61-06	1.39-06	1.21-06	1.06-06	9.31-07	8.23-07	7.31-07	6.51-07	5.83-07	5.24-07
35	4.70-06	3.92-06	3.30-06	2.80-06	2.40-06	2.07-06	1.80-06	1.57-06	1.38-06	1.22-06	1.08-06	9.60-07	8.56-07	7.66-07
30	7.05-06	6.20-06	5.22-06	4.43-06	3.79-06	3.26-06	2.83-06	2.46-06	2.15-06	1.89-06	1.66-06	1.45-06	1.25-06	1.02-06
29	8.24-06	6.86-06	5.77-06	4.89-06	4.18-06	3.60-06	3.12-06	2.71-06	2.36-06	2.06-06	1.80-06	1.55-06	1.25-06	
28	9.15-06	7.61-06	6.40-06	5.42-06	4.63-06	3.98-06	3.44-06	2.99-06	2.59-06	2.25-06	1.92-06	1.56-06		
27	1.02-05	8.48-06	7.12-06	6.03-06	5.15-06	4.42-06	3.81-06	3.29-06	2.84-06	2.42-06	1.95-06			
26	1.14-05	9.47-06	7.95-06	6.73-06	5.73-06	4.91-06	4.21-06	3.61-06	3.06-06	2.45-06				
25	1.28-05	1.06-05	8.91-06	7.53-06	6.40-06	5.46-06	4.65-06	3.92-06	3.13-06					
24	1.44-05	1.20-05	1.00-05	8.45-06	7.15-06	6.05-06	5.07-06	4.02-06						
23	1.63-05	1.35-05	1.13-05	9.49-06	7.98-06	6.64-06	5.23-06							
22	1.86-05	1.54-05	1.28-05	1.06-05	8.79-06	6.88-06								
21	2.12-05	1.75-05	1.44-05	1.18-05	9.18-06									
20	2.43-05	1.99-05	1.61-05	1.24-05										
19	2.79-05	2.24-05	1.71-05											
18	3.17-05	2.39-05												
17	3.42-05													

II TE = 1.25+04 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.09-33	1.83-38	-1.11-37	-3.89-37	-8.77-37	-1.39-36	-1.37-36	-5.07-37	1.14-36	3.45-36	6.41-36	1.01-35	1.45-35	1.99-35
45	1.25-32	2.50-38	-1.54-37	-5.40-37	-1.23-36	-1.95-36	-1.95-36	-7.64-37	1.54-36	4.82-36	9.07-36	1.44-35	2.10-35	2.91-35
40	1.78-32	3.53-38	-2.22-37	-7.84-37	-1.79-36	-2.87-36	-2.93-36	-1.23-36	2.14-36	7.04-36	1.35-35	2.18-35	3.22-35	4.54-35
35	2.67-32	5.23-38	-3.38-37	-1.20-36	-2.77-36	-4.51-36	-4.72-36	-2.19-36	3.05-36	1.09-35	2.16-35	3.56-35	5.40-35	7.79-35
30	4.25-32	8.18-38	-5.55-37	-1.99-36	-4.66-36	-7.75-36	-8.42-36	-4.46-36	4.38-36	1.82-35	3.80-35	6.54-35	1.03-34	1.56-34
29	4.71-32	9.03-38	-6.20-37	-2.23-36	-5.23-36	-8.76-36	-9.61-36	-5.26-36	4.67-36	2.05-35	4.33-35	7.53-35	1.20-34	1.84-34
28	5.25-32	9.99-38	-6.96-37	-2.51-36	-5.91-36	-9.97-36	-1.10-35	-6.25-36	4.97-36	2.31-35	4.96-35	8.75-35	1.42-34	2.20-34
27	5.86-32	1.11-37	-7.84-37	-2.83-36	-6.72-36	-1.14-35	-1.28-35	-7.51-36	5.22-36	2.61-35	5.73-35	1.03-34	1.69-34	2.66-34
26	6.57-32	1.24-37	-8.88-37	-3.22-36	-7.68-36	-1.31-35	-1.49-35	-9.12-36	5.41-36	2.98-35	6.68-35	1.22-34	2.04-34	3.28-34
25	7.41-32	1.38-37	-1.01-36	-3.68-36	-8.84-36	-1.53-35	-1.76-35	-1.12-35	5.47-36	3.41-35	7.86-35	1.46-34	2.50-34	4.13-34
24	8.39-32	1.55-37	-1.16-36	-4.25-36	-1.03-35	-1.79-35	-2.10-35	-1.40-35	5.29-36	3.93-35	9.36-35	1.79-34	3.14-34	5.33-34
23	9.55-32	1.75-37	-1.34-36	-4.93-36	-1.20-35	-2.12-35	-2.54-35	-1.77-35	4.69-36	4.55-35	1.13-34	2.22-34	4.02-34	7.09-34
22	1.09-31	1.98-37	-1.56-36	-5.77-36	-1.42-35	-2.54-35	-3.11-35	-2.28-35	3.36-36	5.31-35	1.38-34	2.82-34	5.31-34	9.82-34
21	1.26-31	2.25-37	-1.83-36	-6.82-36	-1.70-35	-3.08-35	-3.86-35	-3.01-35	7.28-37	6.21-35	1.72-34	3.68-34	7.29-34	1.43-33
20	1.47-31	2.58-37	-2.18-36	-8.16-36	-2.05-35	-3.80-35	-4.90-35	-4.05-35	-4.18-36	7.29-35	2.19-34	4.98-34	1.05-33	2.25-33
19	1.72-31	2.97-37	-2.61-36	-9.87-36	-2.52-35	-4.77-35	-6.35-35	-5.61-35	-1.34-35	8.51-35	2.87-34	7.04-34	1.63-33	3.94-33
18	2.03-31	3.45-37	-3.17-36	-1.21-35	-3.15-35	-6.11-35	-8.45-35	-8.05-35	-3.10-35	9.72-35	3.87-34	1.06-33	2.79-33	8.16-33
17	2.42-31	4.03-37	-3.90-36	-1.51-35	-4.02-35	-8.02-35	-1.16-34	-1.20-34	-6.55-35	1.04-34	5.44-34	1.74-33	5.62-33	2.32-32
16	2.93-31	4.74-37	-4.88-36	-1.93-35	-5.25-35	-1.09-34	-1.66-34	-1.89-34	-1.37-34	8.68-35	8.05-34	3.32-33	1.54-32	1.44-31
15	3.58-31	5.66-37	-6.23-36	-2.51-35	-7.05-35	-1.53-34	-2.49-34	-3.17-34	-2.99-34	-2.32-35	1.26-33	8.30-33	8 96-32	
14	4.45-31	6.86-37	-8.10-36	-3.35-35	-9.81-35	-2.25-34	-3.99-34	-5.79-34	-7.12-34	-5.34-34	2.01-33	4.11-32		
13	5.63-31	8.54-37	-1.08-35	-4.62-35	-1.42-34	-3.51-34	-6.94-34	-1.20-33	-2.00-33	-3.42-33	-1.65-33			
12	7.27-31	1.11-36	-1.47-35	-6.61-35	-2.18-34	-5.93-34	-1.36-33	-2.98-33	-7.71-33	-3.77-32				
11	9.64-31	1.56-36	-2.06-35	-9.86-35	-3.57-34	-1.12-33	-3.19-33	-1.03-32	-6.48-32					
10	1.32-30	2.47-36	-2.92-35	-1.54-34	-6.39-34	-2.48-33	-1.03-32	-7.80-32						
9	1.88-30	4.64-36	-4.11-35	-2.51-34	-1.29-33	-7.28-33	-7.06-32							
8	2.82-30	1.03-35	-5.39-35	-4.28-34	-3.21-33	-4.25-32								
7	4.55-30	2.49-35	-5.88-35	-7.94-34	-1.42-32									
6	8.17-30	6.37-35	-3.10-35	-2.39-33										
5	1.75-29	1.99-34	2.94-34											
4	5.23-29	1.16-33												
3	3.79-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.64-35	3.42-35	4.36-35	5.50-35	6.88-35	8.54-35	1.05-34	1.30-34	1.59-34	1.95-34	2.39-34	2.94-34	3.61-34	4.44-34
45	3.90-35	5.12-35	6.63-35	8.48-35	1.08-34	1.36-34	1.71-34	2.15-34	2.71-34	3.40-34	4.29-34	5.43-34	6.90-34	8.84-34
40	6.20-35	8.29-35	1.09-34	1.43-34	1.86-34	2.42-34	3.15-34	4.09-34	5.34-34	7.02-34	9.29-34	1.24-33	1.69-33	2.33-33
35	1.09-34	1.51-34	2.06-34	2.80-34	3.80-34	5.18-34	7.11-34	9.86-34	1.39-33	1.99-33	2.92-33	4.43-33	7.02-33	1.08-32
30	2.29-34	3.34-34	4.86-34	7.11-34	1.05-33	1.59-33	2.47-33	3.99-33	6.80-33	1.25-32	2.58-32	6.38-32	2.20-31	1.69-30
29	2.75-34	4.07-34	6.03-34	9.03-34	1.38-33	2.15-33	3.50-33	6.00-33	1.11-32	2.30-32	5.70-32	1.97-31	1.51-30	
28	3.38-34	5.04-34	7.66-34	1.18-33	1.86-33	3.05-33	5.26-33	9.77-33	2.03-32	5.07-32	1.76-31	1.36-30		
27	4.13-34	6.39-34	9.98-34	1.59-33	2.63-33	4.57-33	8.54-33	1.79-32	4.47-32	1.56-31	1.20-30			
26	5.21-34	8.30-34	1.34-33	2.24-33	3.93-33	7.41-33	1.56-32	3.92-32	1.37-31	1.07-30				
25	6.75-34	1.11-33	1.89-33	3.34-33	6.35-33	1.35-32	3.41-32	1.20-31	9.36-31					
24	9.03-34	1.56-33	2.80-33	5.38-33	1.15-32	2.93-32	1.04-31	8.12-31						
23	1.26-33	2.31-33	4.50-33	9.72-33	2.50-32	8.90-32	7.02-31							
22	1.85-33	3.68-33	8.07-33	2.10-32	7.55-32	5.98-31								
21	2.93-33	6.57-33	1.73-32	6.31-32	5.07-31									
20	5.20-33	1.40-32	5.18-32	4.20-31										
19	1.10-32	4.14-32	3.41-31											
18	3.19-32	2.69-31												
17	2.93-31													

H TE = 1.50+04 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 1.835-13 4-2 RC = 2.105-14 4-2 EM = 8.601-26 2S RC = 6.268-14 2P RC = 1.298-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.27-04	1.65-04	7.31-05	3.89-05	2.32-05	1.50-05	1.03-05	7.33-06	5.42-06	4.13-06	3.22-06	2.55-06	2.06-06	1.69-06
45	6.87-04	2.17-04	9.69-05	5.21-05	3.14-05	2.04-05	1.40-05	1.01-05	7.49-06	5.72-06	4.46-06	3.55-06	2.87-06	2.36-06
40	9.30-04	2.95-04	1.34-04	7.29-05	4.43-05	2.90-05	2.01-05	1.45-05	1.08-05	8.25-06	6.45-06	5.14-06	4.16-06	3.42-06
35	1.33-03	4.25-04	1.96-04	1.08-04	6.61-05	4.35-05	3.02-05	2.18-05	1.63-05	1.25-05	9.78-06	7.79-06	6.31-06	5.18-06
30	2.03-03	6.59-04	3.08-04	1.71-04	1.05-04	6.96-05	4.84-05	3.50-05	2.62-05	2.00-05	1.57-05	1.25-05	1.01-05	8.30-06
29	2.23-03	7.28-04	3.41-04	1.89-04	1.17-04	7.71-05	5.37-05	3.88-05	2.90-05	2.22-05	1.74-05	1.39-05	1.12-05	9.20-06
28	2.47-03	8.06-04	3.78-04	2.10-04	1.30-04	8.58-05	5.97-05	4.32-05	3.23-05	2.47-05	1.94-05	1.54-05	1.25-05	1.02-05
27	2.74-03	8.97-04	4.22-04	2.35-04	1.45-04	9.58-05	6.67-05	4.83-05	3.60-05	2.76-05	2.16-05	1.72-05	1.39-05	1.14-05
26	3.06-03	1.00-03	4.72-04	2.63-04	1.62-04	1.07-04	7.47-05	5.41-05	4.04-05	3.10-05	2.42-05	1.93-05	1.56-05	1.28-05
25	3.43-03	1.13-03	5.31-04	2.96-04	1.83-04	1.21-04	8.42-05	6.09-05	4.55-05	3.49-05	2.73-05	2.17-05	1.76-05	1.44-05
24	3.86-03	1.27-03	6.00-04	3.35-04	2.07-04	1.37-04	9.52-05	6.89-05	5.15-05	3.94-05	3.08-05	2.46-05	1.98-05	1.62-05
23	4.38-03	1.44-03	6.81-04	3.80-04	2.35-04	1.55-04	1.08-04	7.84-05	5.85-05	4.48-05	3.51-05	2.79-05	2.25-05	1.84-05
22	4.99-03	1.65-03	7.78-04	4.35-04	2.69-04	1.78-04	1.24-04	8.96-05	6.69-05	5.13-05	4.01-05	3.19-05	2.57-05	2.10-05
21	5.73-03	1.89-03	8.95-04	5.00-04	3.09-04	2.05-04	1.42-04	1.03-04	7.70-05	5.89-05	4.61-05	3.66-05	2.95-05	2.40-05
20	6.63-03	2.19-03	1.04-03	5.79-04	3.58-04	2.37-04	1.65-04	1.19-04	8.92-05	6.82-05	5.33-05	4.23-05	3.40-05	2.77-05
19	7.73-03	2.56-03	1.21-03	6.75-04	4.18-04	2.77-04	1.93-04	1.39-04	1.04-04	7.96-05	6.21-05	4.92-05	3.95-05	3.20-05
18	9.09-03	3.01-03	1.42-03	7.95-04	4.91-04	3.26-04	2.27-04	1.64-04	1.22-04	9.36-05	7.29-05	5.76-05	4.60-05	3.69-05
17	1.08-02	3.57-03	1.69-03	9.44-04	5.84-04	3.87-04	2.69-04	1.95-04	1.45-04	1.11-04	8.62-05	6.79-05	5.38-05	4.23-05
16	1.29-02	4.28-03	2.03-03	1.13-03	7.01-04	4.65-04	3.24-04	2.34-04	1.74-04	1.33-04	1.03-04	8.02-05	6.23-05	4.98-05
15	1.57-02	5.20-03	2.46-03	1.38-03	8.52-04	5.65-04	3.93-04	2.84-04	2.11-04	1.60-04	1.23-04	9.42-05	6.84-05	
14	1.94-02	6.39-03	3.03-03	1.70-03	1.05-03	6.96-04	4.84-04	3.49-04	2.59-04	1.95-04	1.47-04	1.05-04		
13	2.42-02	7.99-03	3.79-03	2.12-03	1.31-03	8.71-04	6.05-04	4.35-04	3.20-04	2.37-04	1.67-04			
12	3.08-02	1.02-02	4.82-03	2.70-03	1.68-03	1.11-03	7.69-04	5.50-04	3.97-04	2.75-04				
11	4.02-02	1.32-02	6.28-03	3.52-03	2.18-03	1.44-03	9.94-04	6.99-04	4.73-04					
10	5.37-02	1.77-02	8.39-03	4.71-03	2.92-03	1.92-03	1.30-03	8.59-04						
9	7.41-02	2.44-02	1.16-02	6.50-03	4.01-03	2.60-03	1.66-03							
8	1.06-01	3.50-02	1.66-02	9.32-03	5.69-03	3.48-03								
7	1.61-01	5.29-02	2.51-02	1.40-02	8.08-03									
6	2.62-01	8.56-02	4.04-02	2.15-02										
5	4.73-01	1.52-01	6.91-02											
4	1.00+00	3.05-01												
3	2.79+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.40-06	1.17-06	9.95-07	8.50-07	7.31-07	6.34-07	5.53-07	4.86-07	4.28-07	3.80-07	3.38-07	3.03-07	2.72-07	2.45-07
45	1.96-06	1.64-06	1.39-06	1.19-06	1.02-06	8.88-07	7.75-07	6.80-07	6.00-07	5.32-07	4.73-07	4.23-07	3.80-07	3.42-07
40	2.84-06	2.38-06	2.02-06	1.73-06	1.49-06	1.29-06	1.12-06	9.85-07	8.68-07	7.69-07	6.84-07	6.10-07	5.47-07	4.91-07
35	4.30-06	3.61-06	3.06-06	2.61-06	2.24-06	1.94-06	1.69-06	1.48-06	1.30-06	1.15-06	1.02-06	9.08-07	8.09-07	7.23-07
30	6.89-06	5.77-06	4.88-06	4.16-06	3.57-06	3.08-06	2.67-06	2.33-06	2.04-06	1.78-06	1.56-06	1.36-06	1.17-06	9.46-07
29	7.63-06	6.39-06	5.40-06	4.60-06	3.95-06	3.40-06	2.95-06	2.56-06	2.24-06	1.95-06	1.69-06	1.45-06	1.17-06	
28	8.48-06	7.10-06	6.00-06	5.11-06	4.37-06	3.77-06	3.26-06	2.82-06	2.45-06	2.12-06	1.80-06	1.45-06		
27	9.46-06	7.92-06	6.68-06	5.68-06	4.86-06	4.18-06	3.60-06	3.11-06	2.67-06	2.26-06	1.81-06			
26	1.06-05	8.85-06	7.47-06	6.34-06	5.41-06	4.64-06	3.98-06	3.40-06	2.87-06	2.28-06				
25	1.19-05	9.94-06	8.37-06	7.09-06	6.04-06	5.15-06	4.38-06	3.67-06	2.90-06					
24	1.34-05	1.12-05	9.41-06	7.95-06	6.74-06	5.69-06	4.75-06	3.73-06						
23	1.52-05	1.27-05	1.06-05	8.92-06	7.49-06	6.21-06	4.85-06							
22	1.73-05	1.44-05	1.20-05	9.99-06	8.22-06	6.38-06								
21	1.98-05	1.63-05	1.35-05	1.10-05	8.50-06									
20	2.26-05	1.85-05	1.50-05	1.15-05										
19	2.59-05	2.08-05	1.58-05											
18	2.94-05	2.21-05												
17	3.14-05													

H TE = 1.50+04 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	9.29-38	1.03-37	1.29-37	1.76-37	2.69-37	4.59-37	8.25-37	1.48-36	2.60-36	4.40-36	7.17-36	1.13-35	1.74-35
45	0.00+00	1.29-37	1.51-37	2.06-37	3.02-37	4.74-37	7.82-37	1.32-36	2.22-36	3.66-36	5.91-36	9.30-36	1.43-35	2.15-35
40	0.00+00	1.85-37	2.23-37	3.22-37	4.92-37	7.72-37	1.23-36	1.97-36	3.13-36	4.89-36	7.53-36	1.14-35	1.70-35	2.49-35
35	0.00+00	2.74-37	3.37-37	4.99-37	7.70-37	1.19-36	1.84-36	2.80-36	4.21-36	6.24-36	9.14-36	1.32-35	1.90-35	2.69-35
30	0.00+00	4.29-37	5.31-37	7.92-37	1.22-36	1.85-36	2.77-36	4.06-36	5.84-36	8.23-36	1.14-35	1.57-35	2.12-35	2.82-35
29	0.00+00	4.75-37	5.87-37	8.76-37	1.35-36	2.05-36	3.05-36	4.44-36	6.34-36	8.87-36	1.22-35	1.65-35	2.19-35	2.86-35
28	0.00+00	5.27-37	6.51-37	9.73-37	1.50-36	2.27-36	3.38-36	4.90-36	6.95-36	9.66-36	1.32-35	1.75-35	2.28-35	2.90-35
27	0.00+00	5.87-37	7.26-37	1.09-36	1.67-36	2.54-36	3.77-36	5.45-36	7.71-36	1.06-35	1.44-35	1.89-35	2.40-35	2.92-35
26	0.00+00	6.57-37	8.13-37	1.22-36	1.88-36	2.85-36	4.24-36	6.13-36	8.65-36	1.19-35	1.59-35	2.06-35	2.55-35	2.93-35
25	0.00+00	7.40-37	9.17-37	1.38-36	2.13-36	3.24-36	4.82-36	6.98-36	9.84-36	1.35-35	1.79-35	2.28-35	2.72-35	2.88-35
24	0.00+00	8.37-37	1.04-36	1.57-36	2.43-36	3.71-36	5.54-36	8.05-36	1.14-35	1.56-35	2.05-35	2.57-35	2.92-35	2.66-35
23	0.00+00	9.54-37	1.19-36	1.79-36	2.79-36	4.30-36	6.45-36	9.42-36	1.34-35	1.83-35	2.40-35	2.94-35	3.12-35	2.07-35
22	0.00+00	1.09-36	1.36-36	2.07-36	3.25-36	5.03-36	7.61-36	1.12-35	1.60-35	2.20-35	2.87-35	3.41-35	3.22-35	5.60-36
21	0.00+00	1.26-36	1.58-36	2.42-36	3.82-36	5.96-36	9.10-36	1.35-35	1.95-35	2.69-35	3.49-35	3.98-35	2.96-35	-3.32-35
20	0.00+00	1.47-36	1.85-36	2.84-36	4.53-36	7.16-36	1.11-35	1.67-35	2.43-35	3.38-35	4.34-35	4.60-35	1.58-35	-1.38-34
19	0.00+00	1.72-36	2.18-36	3.39-36	5.46-36	8.74-36	1.37-35	2.09-35	3.10-35	4.35-35	5.50-35	4.98-35	-3.43-35	-4.59-34
18	0.00+00	2.04-36	2.60-36	4.08-36	6.67-36	1.09-35	1.73-35	2.70-35	4.07-35	5.77-35	7.01-35	3.96-35	-2.13-34	-1.68-33
17	0.00+00	2.45-36	3.14-36	4.99-36	8.29-36	1.38-35	2.25-35	3.59-35	5.53-35	7.87-35	8.64-35	-3.54-35	-9.75-34	-8.48-33
16	0.00+00	2.97-36	3.85-36	6.21-36	1.05-35	1.79-35	3.01-35	4.95-35	7.83-35	1.10-34	8.45-35	-4.44-34	-5.60-33	-1.02-31
15	0.00+00	3.65-36	4.79-36	7.87-36	1.37-35	2.40-35	4.17-35	7.15-35	1.16-34	1.54-34	-6.99-35	-3.72-33	-7.43-32	
14	0.00+00	4.57-36	6.08-36	1.02-35	1.83-35	3.34-35	6.09-35	1.10-34	1.83-34	1.69-34	-1.61-33	-5.08-32		
13	0.00+00	5.83-36	7.90-36	1.37-35	2.55-35	4.88-35	9.49-35	1.82-34	2.95-34	-4.25-34	-3.19-32			
12	0.00+00	7.62-36	1.06-35	1.90-35	3.73-35	7.66-35	1.62-34	3.37-34	3.11-34	-1.74-32				
11	0.00+00	1.02-35	1.46-35	2.77-35	5.85-35	1.33-34	3.20-34	6.83-34	-7.21-33					
10	0.00+00	1.43-35	2.13-35	4.32-35	1.02-34	2.69-34	7.88-34	-7.93-34						
9	0.00+00	2.09-35	3.30-35	7.44-35	2.07-34	7.20-34	2.50-33							
8	0.00+00	3.26-35	5.64-35	1.50-34	5.70-34	3.53-33								
7	0.00+00	5.58-35	1.12-34	4.09-34	3.20-33									
6	0.00+00	1.11-34	2.94-34	2.32-33										
5	0.00+00	2.88-34	1.54-33											
4	0.00+00	1.42-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.60-35	3.80-35	5.46-35	7.72-35	1.08-34	1.49-34	2.03-34	2.75-34	3.71-34	4.97-34	6.63-34	8.82-34	1.17-33	1.56-33
45	3.16-35	4.58-35	6.54-35	9.23-35	1.29-34	1.79-34	2.46-34	3.36-34	4.58-34	6.23-34	8.47-34	1.15-33	1.57-33	2.14-33
40	3.60-35	5.16-35	7.32-35	1.03-34	1.44-34	2.01-34	2.79-34	3.87-34	5.38-34	7.49-34	1.05-33	1.48-33	2.10-33	3.03-33
35	3.80-35	5.33-35	7.46-35	1.04-34	1.45-34	2.03-34	2.85-34	4.01-34	5.71-34	8.20-34	1.20-33	1.78-33	2.72-33	4.33-33
30	3.72-35	4.84-35	6.17-35	7.67-35	9.11-35	9.86-35	8.28-35	1.24-36	-2.62-34	-1.05-33	-3.53-33	-1.26-32	-5.78-32	-5.51-31
29	3.65-35	4.53-35	5.37-35	5.84-35	5.15-35	1.35-35	-1.04-34	-4.28-34	-1.33-33	-4.03-33	-1.37-32	-6.14-32	-5.88-31	
28	3.53-35	4.04-35	4.06-35	2.74-35	-1.92-35	-1.48-34	-4.88-34	-1.41-33	-4.12-33	-1.37-32	-6.14-32	-5.92-31		
27	3.31-35	3.21-35	1.80-35	-2.81-35	-1.53-34	-4.78-34	-1.35-33	-3.94-33	-1.31-32	-5.89-32	-5.75-31			
26	2.91-35	1.75-35	-2.24-35	-1.33-34	-4.24-34	-1.21-33	-3.58-33	-1.20-32	-5.46-32	-5.43-31				
25	2.14-35	-9.22-36	-9.94-35	-3.46-34	-1.03-33	-3.11-33	-1.07-32	-4.94-32	-5.01-31					
24	6.23-36	-6.18-35	-2.59-34	-8.26-34	-2.60-33	-9.17-33	-4.35-32	-4.53-31						
23	-2.55-35	-1.73-34	-6.24-34	-2.08-33	-7.66-33	-3.75-32	-4.03-31							
22	-9.67-35	-4.36-34	-1.59-33	-6.19-33	-3.16-32	-3.52-31								
21	-2.73-34	-1.15-33	-4.83-33	-2.60-32	-3.03-31									
20	-7.72-34	-3.61-33	-2.08-32	-2.56-31										
19	-2.55-33	-1.61-32	-2.12-31											
18	-1.20-32	-1.71-31												
17	-1.35-31													

H TE = 1.50+04 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 1.836-13 4-2 RC = 2.106-14 4-2 EM = 8.608-26 2S RC = 6.274-14 2P RC = 1.209-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.01-04	1.85-04	8.02-05	4.18-05	2.45-05	1.56-05	1.05-05	7.44-06	5.46-06	4.12-06	3.19-06	2.52-06	2.02-06	1.65-06
45	7.93-04	2.45-04	1.07-04	5.58-05	3.28-05	2.09-05	1.42-05	1.00-05	7.38-06	5.58-06	4.33-06	3.42-06	2.75-06	2.24-06
40	1.07-03	3.34-04	1.46-04	7.71-05	4.57-05	2.93-05	1.99-05	1.42-05	1.05-05	7.93-06	6.16-06	4.88-06	3.93-06	3.21-06
35	1.50-03	4.72-04	2.09-04	1.12-04	6.67-05	4.32-05	2.96-05	2.12-05	1.57-05	1.19-05	9.29-06	7.38-06	5.95-06	4.88-06
30	2.23-03	7.05-04	3.18-04	1.73-04	1.05-04	6.83-05	4.71-05	3.39-05	2.52-05	1.93-05	1.50-05	1.20-05	9.67-06	7.93-06
29	2.44-03	7.72-04	3.50-04	1.90-04	1.16-04	7.56-05	5.23-05	3.76-05	2.80-05	2.14-05	1.67-05	1.33-05	1.08-05	8.82-06
28	2.67-03	8.48-04	3.86-04	2.11-04	1.28-04	8.41-05	5.82-05	4.20-05	3.12-05	2.39-05	1.87-05	1.49-05	1.20-05	9.84-06
27	2.95-03	9.37-04	4.28-04	2.35-04	1.43-04	9.40-05	6.51-05	4.70-05	3.50-05	2.68-05	2.09-05	1.66-05	1.34-05	1.10-05
26	3.26-03	1.04-03	4.77-04	2.62-04	1.60-04	1.05-04	7.31-05	5.28-05	3.93-05	3.01-05	2.35-05	1.87-05	1.51-05	1.24-05
25	3.62-03	1.16-03	5.35-04	2.95-04	1.81-04	1.19-04	8.25-05	5.96-05	4.44-05	3.40-05	2.65-05	2.11-05	1.70-05	1.39-05
24	4.05-03	1.30-03	6.03-04	3.33-04	2.04-04	1.35-04	9.35-05	6.75-05	5.04-05	3.85-05	3.01-05	2.39-05	1.93-05	1.58-05
23	4.56-03	1.47-03	6.83-04	3.78-04	2.32-04	1.53-04	1.07-04	7.70-05	5.74-05	4.39-05	3.43-05	2.72-05	2.20-05	1.79-05
22	5.16-03	1.67-03	7.79-04	4.32-04	2.66-04	1.76-04	1.22-04	8.82-05	6.58-05	5.03-05	3.93-05	3.12-05	2.51-05	2.05-05
21	5.88-03	1.91-03	8.95-04	4.98-04	3.06-04	2.02-04	1.41-04	1.02-04	7.58-05	5.79-05	4.52-05	3.59-05	2.89-05	2.35-05
20	6.76-03	2.21-03	1.04-03	5.76-04	3.55-04	2.35-04	1.63-04	1.18-04	8.79-05	6.71-05	5.23-05	4.15-05	3.33-05	2.70-05
19	7.84-03	2.57-03	1.21-03	6.73-04	4.15-04	2.74-04	1.91-04	1.38-04	1.03-04	7.84-05	6.10-05	4.83-05	3.87-05	3.12-05
18	9.18-03	3.02-03	1.42-03	7.92-04	4.89-04	3.23-04	2.25-04	1.62-04	1.21-04	9.22-05	7.16-05	5.65-05	4.51-05	3.61-05
17	1.09-02	3.58-03	1.69-03	9.41-04	5.81-04	3.84-04	2.67-04	1.93-04	1.43-04	1.09-04	8.47-05	6.65-05	5.26-05	4.13-05
16	1.30-02	4.29-03	2.02-03	1.13-03	6.98-04	4.62-04	3.21-04	2.32-04	1.72-04	1.31-04	1.01-04	7.86-05	6.09-05	4.49-05
15	1.58-02	5.20-03	2.46-03	1.37-03	8.48-04	5.61-04	3.90-04	2.81-04	2.08-04	1.58-04	1.21-04	9.22-05	6.70-05	
14	1.94-02	6.40-03	3.02-03	1.69-03	1.05-03	6.91-04	4.80-04	3.45-04	2.55-04	1.91-04	1.44-04	1.03-04		
13	2.42-02	8.00-03	3.78-03	2.12-03	1.31-03	8.65-04	5.99-04	4.30-04	3.15-04	2.32-04	1.63-04			
12	3.09-02	1.02-02	4.82-03	2.70-03	1.67-03	1.10-03	7.61-04	5.42-04	3.90-04	2.69-04				
11	4.02-02	1.32-02	6.27-03	3.51-03	2.17-03	1.43-03	9.83-04	6.88-04	4.64-04					
10	5.37-02	1.77-02	8.38-03	4.70-03	2.90-03	1.90-03	1.28-03	8.43-04						
9	7.41-02	2.44-02	1.16-02	6.48-03	3.98-03	2.57-03	1.63-03							
8	1.07-01	3.50-02	1.66-02	9.28-03	5.64-03	3.43-03								
7	1.61-01	5.28-02	2.51-02	1.39-02	7.97-03									
6	2.63-01	8.59-02	4.03-02	2.12-02										
5	4.73-01	1.52-01	6.86-02											
4	1.00+00	3.03-01												
3	2.78+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.36-06	1.14-06	9.60-07	8.17-07	7.02-07	6.07-07	5.29-07	4.63-07	4.08-07	3.61-07	3.21-07	2.87-07	2.58-07	2.32-07
45	1.86-06	1.55-06	1.31-06	1.12-06	9.59-07	8.30-07	7.23-07	6.34-07	5.58-07	4.94-07	4.40-07	3.93-07	3.52-07	3.17-07
40	2.66-06	2.23-06	1.88-06	1.61-06	1.38-06	1.19-06	1.04-06	9.12-07	8.04-07	7.12-07	6.33-07	5.65-07	5.06-07	4.55-07
35	4.04-06	3.39-06	2.87-06	2.45-06	2.10-06	1.82-06	1.59-06	1.39-06	1.22-06	1.08-06	9.60-07	8.55-07	7.64-07	6.83-07
30	6.57-06	5.51-06	4.66-06	3.97-06	3.41-06	2.95-06	2.56-06	2.23-06	1.95-06	1.72-06	1.51-06	1.32-06	1.13-06	9.21-07
29	7.31-06	6.12-06	5.18-06	4.41-06	3.78-06	3.26-06	2.83-06	2.47-06	2.15-06	1.88-06	1.64-06	1.40-06	1.14-06	
28	8.15-06	6.83-06	5.77-06	4.91-06	4.21-06	3.63-06	3.14-06	2.73-06	2.37-06	2.05-06	1.75-06	1.41-06		
27	9.12-06	7.63-06	6.44-06	5.48-06	4.69-06	4.03-06	3.48-06	3.01-06	2.59-06	2.20-06	1.77-06			
26	1.02-05	8.56-06	7.22-06	6.13-06	5.24-06	4.49-06	3.86-06	3.31-06	2.80-06	2.23-06				
25	1.15-05	9.64-06	8.11-06	6.88-06	5.86-06	5.00-06	4.26-06	3.58-06	2.84-06					
24	1.30-05	1.09-05	9.14-06	7.73-06	6.55-06	5.56-06	4.63-06	3.66-06						
23	1.48-05	1.23-05	1.03-05	8.68-06	7.30-06	6.06-06	4.75-06							
22	1.69-05	1.40-05	1.17-05	9.73-06	8.03-06	6.25-06								
21	1.93-05	1.59-05	1.32-05	1.08-05	8.34-06									
20	2.21-05	1.81-05	1.47-05	1.13-05										
19	2.53-05	2.03-05	1.55-05											
18	2.87-05	2.16-05												
17	3.08-05													

H TE = 1.50+04 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	8.76-38	7.85-38	6.01-38	2.26-38	-1.87-38	-2.05-38	9.78-38	5.65-37	1.27-36	2.79-36	5.39-36	9.56-36	1.60-35
45	0.00+00	1.23-37	1.19-37	1.15-37	1.06-37	1.23-37	2.42-37	5.93-37	1.38-36	2.92-36	5.63-36	1.01-35	1.73-35	2.81-35
40	0.00+00	1.80-37	1.89-37	2.17-37	2.68-37	3.99-37	7.25-37	1.45-36	2.97-36	5.47-36	9.89-36	1.71-35	2.85-35	4.58-35
35	0.00+00	2.76-37	3.14-37	4.15-37	5.96-37	9.49-37	1.65-36	2.97-36	5.37-36	9.50-36	1.63-35	2.73-35	4.45-35	7.10-35
30	0.00+00	4.45-37	5.40-37	7.82-37	1.21-36	1.96-36	3.26-36	5.49-36	9.22-36	1.53-35	2.52-35	4.08-35	6.52-35	1.03-34
29	0.00+00	4.93-37	6.03-37	8.85-37	1.38-36	2.23-36	3.68-36	6.13-36	1.02-35	1.67-35	2.72-35	4.37-35	6.97-35	1.10-34
28	0.00+00	5.48-37	6.75-37	1.00-36	1.57-36	2.54-36	4.15-36	6.82-36	1.12-35	1.81-35	2.92-35	4.67-35	7.41-35	1.17-34
27	0.00+00	6.10-37	7.58-37	1.13-36	1.79-36	2.87-36	4.66-36	7.57-36	1.22-35	1.96-35	3.13-35	4.96-35	7.85-35	1.24-34
26	0.00+00	6.83-37	8.51-37	1.28-36	2.03-36	3.25-36	5.24-36	8.39-36	1.34-35	2.12-35	3.35-35	5.27-35	8.30-35	1.31-34
25	0.00+00	7.66-37	9.60-37	1.45-36	2.30-36	3.68-36	5.88-36	9.32-36	1.47-35	2.30-35	3.59-35	5.60-35	8.75-35	1.37-34
24	0.00+00	8.65-37	1.09-36	1.65-36	2.62-36	4.18-36	6.62-36	1.04-35	1.62-35	2.50-35	3.86-35	5.94-35	9.20-35	1.43-34
23	0.00+00	9.81-37	1.23-36	1.89-36	3.00-36	4.76-36	7.50-36	1.17-35	1.79-35	2.74-35	4.17-35	6.33-35	9.63-35	1.47-34
22	0.00+00	1.12-36	1.41-36	2.16-36	3.44-36	5.47-36	8.56-36	1.32-35	2.02-35	3.04-35	4.55-35	6.76-35	9.98-35	1.46-34
21	0.00+00	1.29-36	1.63-36	2.50-36	3.99-36	6.34-36	9.91-36	1.52-35	2.30-35	3.43-35	5.02-35	7.22-35	1.01-34	1.30-34
20	0.00+00	1.49-36	1.89-36	2.92-36	4.68-36	7.45-36	1.17-35	1.79-35	2.69-35	3.95-35	5.65-35	7.67-35	9.26-35	7.05-35
19	0.00+00	1.75-36	2.22-36	3.45-36	5.56-36	8.90-36	1.40-35	2.15-35	3.23-35	4.69-35	6.44-35	7.80-35	5.67-35	-1.33-34
18	0.00+00	2.06-36	2.63-36	4.12-36	6.71-36	1.08-35	1.72-35	2.67-35	4.01-35	5.73-35	7.37-35	6.51-35	-7.85-35	-9.26-34
17	0.00+00	2.46-36	3.16-36	5.01-36	8.25-36	1.35-35	2.18-35	3.42-35	5.17-35	7.23-35	8.05-35	-5.05-36	-6.36-34	-5.22-33
16	0.00+00	2.98-36	3.86-36	6.19-36	1.04-35	1.74-35	2.86-35	4.58-35	6.97-35	9.33-35	6.43-35	-3.46-34	-3.82-33	-5.85-32
15	0.00+00	3.67-36	4.80-36	7.82-36	1.34-35	2.30-35	3.90-35	6.43-35	9.88-35	1.17-34	-9.58-35	-2.51-33	-4.58-32	
14	0.00+00	4.58-36	6.08-36	1.01-35	1.78-35	3.18-35	5.61-35	9.59-35	1.46-34	9.36-35	-1.38-33	-3.37-32		
13	0.00+00	5.84-36	7.89-36	1.35-35	2.47-35	4.61-35	8.60-35	1.54-34	2.15-34	-5.00-34	-2.29-32			
12	0.00+00	7.63-36	1.05-35	1.87-35	3.60-35	7.18-35	1.45-34	2.72-34	1.23-34	-1.38-32				
11	0.00+00	1.03-35	1.46-35	2.72-35	5.63-35	1.23-34	2.77-34	4.93-34	-6.55-33					
10	0.00+00	1.43-35	2.12-35	4.24-35	9.71-35	2.46-34	6.47-34	-1.45-33						
9	0.00+00	2.09-35	3.29-35	7.29-35	1.97-34	6.37-34	1.60-33							
8	0.00+00	3.26-35	5.60-35	1.47-34	5.31-34	2.87-33								
7	0.00+00	5.58-35	1.11-34	3.96-34	2.86-33									
6	0.00+00	1.11-34	2.91-34	2.20-33										
5	0.00+00	2.88-34	1.52-33											
4	0.00+00	1.42-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.55-35	3.92-35	5.85-35	8.53-35	1.22-34	1.71-34	2.37-34	3.24-34	4.39-34	5.88-34	7.83-34	1.03-33	1.36-33	1.77-33
45	4.43-35	6.77-35	1.01-34	1.48-34	2.14-34	3.04-34	4.28-34	5.97-34	8.28-34	1.14-33	1.57-33	2.15-33	2.94-33	4.03-33
40	7.17-35	1.10-34	1.65-34	2.45-34	3.60-34	5.23-34	7.55-34	1.09-33	1.56-33	2.24-33	3.24-33	4.70-33	6.88-33	1.02-32
35	1.11-34	1.71-34	2.62-34	3.96-34	5.96-34	8.97-34	1.35-33	2.05-33	3.14-33	4.88-33	7.73-33	1.26-32	2.13-32	3.79-32
30	1.63-34	2.55-34	4.00-34	6.30-34	1.00-33	1.62-33	2.67-33	4.54-33	8.12-33	1.55-32	3.30-32	8.35-32	2.91-31	2.25-30
29	1.74-34	2.74-34	4.34-34	6.92-34	1.12-33	1.85-33	3.14-33	5.60-33	1.07-32	2.25-32	5.63-32	1.94-31	1.48-30	
28	1.85-34	2.94-34	4.70-34	7.60-34	1.25-33	2.13-33	3.78-33	7.13-33	1.49-32	3.67-32	1.24-31	9.31-31		
27	1.97-34	3.14-34	5.07-34	8.34-34	1.41-33	2.48-33	4.64-33	9.52-33	2.29-32	7.53-32	5.48-31			
26	2.08-34	3.34-34	5.46-34	9.14-34	1.59-33	2.92-33	5.84-33	1.36-32	4.23-32	2.91-31				
25	2.18-34	3.52-34	5.80-34	9.86-34	1.75-33	3.38-33	7.36-33	2.07-32	1.23-31					
24	2.26-34	3.63-34	5.95-34	1.01-33	1.79-33	3.39-33	7.06-33	1.77-32						
23	2.27-34	3.52-34	5.44-34	8.12-34	9.73-34	-1.12-33	-4.47-32							
22	2.08-34	2.73-34	2.52-34	-3.91-34	-5.65-33	-7.87-32								
21	1.31-34	-3.09-35	-1.04-33	-7.72-33	-9.41-32									
20	-1.34-34	-1.24-33	-8.17-33	-9.71-32										
19	-1.15-33	-7.64-33	-9.23-32											
18	-6.57-33	-8.31-32												
17	-7.13-32													

H TE = 1.50+04 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 1.838-13 4-2 RC = 2.109-14 4-2 EM = 8.620-26 2S RC = 6.285-14 2P RC = 1.210-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.81-04	2.09-04	8.99-05	4.66-05	2.72-05	1.73-05	1.16-05	8.19-06	5.99-06	4.52-06	3.49-06	2.75-06	2.20-06	1.79-06
45	8.89-04	2.73-04	1.18-04	6.10-05	3.56-05	2.26-05	1.52-05	1.07-05	7.86-06	5.92-06	4.58-06	3.61-06	2.89-06	2.36-06
40	1.20-03	3.70-04	1.60-04	8.29-05	4.85-05	3.08-05	2.08-05	1.47-05	1.07-05	8.09-06	6.25-06	4.93-06	3.96-06	3.22-06
35	1.71-03	5.28-04	2.28-04	1.19-04	6.98-05	4.44-05	3.00-05	2.12-05	1.56-05	1.18-05	9.09-06	7.18-06	5.76-06	4.70-06
30	2.56-03	7.94-04	3.47-04	1.82-04	1.07-04	6.88-05	4.67-05	3.32-05	2.44-05	1.85-05	1.43-05	1.13-05	9.11-06	7.43-06
29	2.79-03	8.68-04	3.80-04	2.00-04	1.18-04	7.58-05	5.15-05	3.66-05	2.70-05	2.04-05	1.59-05	1.26-05	1.01-05	8.25-06
28	3.05-03	9.51-04	4.17-04	2.20-04	1.31-04	8.39-05	5.71-05	4.07-05	3.00-05	2.27-05	1.76-05	1.40-05	1.12-05	9.19-06
27	3.35-03	1.05-03	4.60-04	2.44-04	1.45-04	9.32-05	6.36-05	4.53-05	3.34-05	2.54-05	1.97-05	1.56-05	1.26-05	1.03-05
26	3.68-03	1.15-03	5.09-04	2.71-04	1.61-04	1.04-04	7.11-05	5.08-05	3.75-05	2.85-05	2.22-05	1.76-05	1.42-05	1.16-05
25	4.07-03	1.28-03	5.66-04	3.02-04	1.81-04	1.17-04	8.00-05	5.72-05	4.23-05	3.22-05	2.50-05	1.98-05	1.60-05	1.31-05
24	4.52-03	1.42-03	6.33-04	3.39-04	2.03-04	1.32-04	9.04-05	6.48-05	4.80-05	3.65-05	2.84-05	2.25-05	1.82-05	1.48-05
23	5.04-03	1.59-03	7.11-04	3.82-04	2.30-04	1.50-04	1.03-04	7.38-05	5.47-05	4.17-05	3.25-05	2.57-05	2.07-05	1.69-05
22	5.66-03	1.79-03	8.04-04	4.35-04	2.63-04	1.71-04	1.18-04	8.46-05	6.28-05	4.79-05	3.73-05	2.96-05	2.38-05	1.94-05
21	6.40-03	2.02-03	9.16-04	4.97-04	3.02-04	1.97-04	1.36-04	9.77-05	7.26-05	5.53-05	4.31-05	3.42-05	2.75-05	2.24-05
20	7.29-03	2.31-03	1.05-03	5.74-04	3.49-04	2.29-04	1.58-04	1.14-04	8.45-05	6.44-05	5.01-05	3.97-05	3.19-05	2.59-05
19	8.37-03	2.66-03	1.22-03	6.68-04	4.08-04	2.68-04	1.85-04	1.33-04	9.90-05	7.54-05	5.87-05	4.64-05	3.71-05	3.00-05
18	9.69-03	3.09-03	1.43-03	7.85-04	4.81-04	3.16-04	2.19-04	1.58-04	1.17-04	8.90-05	6.91-05	5.45-05	4.34-05	3.48-05
17	1.13-02	3.64-03	1.69-03	9.33-04	5.72-04	3.77-04	2.61-04	1.88-04	1.39-04	1.06-04	8.20-05	6.43-05	5.08-05	4.09-05
16	1.34-02	4.34-03	2.02-03	1.12-03	6.88-04	4.53-04	3.14-04	2.26-04	1.67-04	1.27-04	9.78-05	7.61-05	5.90-05	4.36-05
15	1.61-02	5.24-03	2.45-03	1.36-03	8.38-04	5.52-04	3.82-04	2.75-04	2.03-04	1.53-04	1.17-04	8.94-05	6.51-05	
14	1.97-02	6.43-03	3.02-03	1.68-03	1.03-03	6.81-04	4.71-04	3.38-04	2.49-04	1.86-04	1.40-04	1.00-04		
13	2.45-02	8.02-03	3.77-03	2.10-03	1.30-03	8.53-04	5.89-04	4.21-04	3.07-04	2.26-04	1.59-04			
12	3.11-02	1.02-02	4.81-03	2.68-03	1.65-03	1.09-03	7.48-04	5.30-04	3.80-04	2.62-04				
11	4.03-02	1.33-02	6.26-03	3.49-03	2.15-03	1.41-03	9.54-04	6.71-04	4.51-04					
10	5.38-02	1.77-02	8.36-03	4.67-03	2.87-03	1.87-03	1.26-03	8.21-04						
9	7.42-02	2.44-02	1.15-02	6.43-03	3.93-03	2.53-03	1.59-03							
8	1.07-01	3.50-02	1.65-02	9.20-03	5.55-03	3.35-03								
7	1.61-01	5.28-02	2.49-02	1.37-02	7.81-03									
6	2.63-01	8.53-02	4.00-02	2.09-02										
5	4.73-01	1.51-01	6.77-02											
4	1.00+00	3.01-01												
3	2.78+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.48-06	1.24-06	1.04-06	8.86-07	7.60-07	6.57-07	5.72-07	5.01-07	4.41-07	3.90-07	3.47-07	3.09-07	2.77-07	2.50-07
45	1.94-06	1.62-06	1.37-06	1.16-06	9.99-07	8.63-07	7.51-07	6.57-07	5.79-07	5.12-07	4.55-07	4.06-07	3.64-07	3.27-07
40	2.66-06	2.22-06	1.87-06	1.59-06	1.37-06	1.18-06	1.03-06	8.99-07	7.91-07	7.00-07	6.22-07	5.55-07	4.97-07	4.46-07
35	3.88-06	3.24-06	2.73-06	2.33-06	1.99-06	1.72-06	1.50-06	1.31-06	1.15-06	1.02-06	9.03-07	8.04-07	7.18-07	6.42-07
30	6.15-06	5.14-06	4.33-06	3.69-06	3.16-06	2.73-06	2.37-06	2.07-06	1.81-06	1.59-06	1.40-06	1.23-06	1.06-06	8.64-07
29	6.82-06	5.70-06	4.81-06	4.09-06	3.51-06	3.03-06	2.63-06	2.29-06	2.00-06	1.75-06	1.53-06	1.31-06	1.07-06	
28	7.60-06	6.35-06	5.36-06	4.56-06	3.91-06	3.37-06	2.92-06	2.54-06	2.21-06	1.92-06	1.64-06	1.33-06		
27	8.50-06	7.11-06	6.00-06	5.10-06	4.36-06	3.76-06	3.25-06	2.81-06	2.43-06	2.07-06	1.67-06			
26	9.56-06	7.99-06	6.74-06	5.72-06	4.89-06	4.20-06	3.62-06	3.11-06	2.64-06	2.12-06				
25	1.08-05	9.02-06	7.60-06	6.45-06	5.50-06	4.70-06	4.02-06	3.39-06	2.71-06					
24	1.23-05	1.02-05	8.61-06	7.28-06	6.19-06	5.25-06	4.41-06	3.50-06						
23	1.40-05	1.16-05	9.77-06	8.23-06	6.94-06	5.78-06	4.56-06							
22	1.60-05	1.33-05	1.11-05	9.29-06	7.68-06	6.02-06								
21	1.84-05	1.52-05	1.26-05	1.03-05	8.04-06									
20	2.12-05	1.74-05	1.41-05	1.09-05										
19	2.44-05	1.96-05	1.50-05											
18	2.77-05	2.10-05												
17	2.99-05													

H TE = 1.50+04 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	8.08-38	4.87-38	-3.25-38	-2.10-37	-5.29-37	-1.03-36	-1.77-36	-2.79-36	-4.15-36	-5.94-36	-8.28-36	-1.14-35	-1.55-35
45	0.00+00	1.15-37	8.37-38	6.81-39	-1.61-37	-4.47-37	-8.67-37	-1.41-36	-2.06-36	-2.77-36	-3.45-36	-4.05-36	-4.47-36	-4.70-36
40	0.00+00	1.70-37	1.43-37	8.19-38	-5.05-38	-2.50-37	-4.69-37	-5.99-37	-4.57-37	2.46-37	1.92-36	5.13-36	1.06-35	1.93-35
35	0.00+00	2.62-37	2.47-37	2.19-37	1.55-37	1.14-37	2.46-37	8.36-37	2.36-36	5.56-36	1.15-35	2.19-35	3.90-35	6.61-35
30	0.00+00	4.32-37	4.52-37	5.14-37	6.27-37	9.41-37	1.79-36	3.77-36	7.90-36	1.58-35	3.02-35	5.50-35	9.66-35	1.65-34
29	0.00+00	4.82-37	5.16-37	6.13-37	7.90-37	1.23-36	2.31-36	4.73-36	9.67-36	1.91-35	3.60-35	6.53-35	1.15-34	1.97-34
28	0.00+00	5.41-37	5.92-37	7.31-37	9.90-37	1.58-36	2.94-36	5.88-36	1.18-35	2.28-35	4.28-35	7.76-35	1.37-34	2.37-34
27	0.00+00	6.08-37	6.81-37	8.73-37	1.23-36	2.00-36	3.70-36	7.25-36	1.42-35	2.73-35	5.08-35	9.20-35	1.63-34	2.84-34
26	0.00+00	6.87-37	7.85-37	1.04-36	1.52-36	2.52-36	4.61-36	8.87-36	1.71-35	3.25-35	6.02-35	1.09-34	1.94-34	3.42-34
25	0.00+00	7.78-37	9.09-37	1.25-36	1.88-36	3.14-36	5.70-36	1.08-35	2.05-35	3.86-35	7.12-35	1.29-34	2.32-34	4.13-34
24	0.00+00	8.86-37	1.06-36	1.49-36	2.30-36	3.87-36	6.99-36	1.30-35	2.45-35	4.57-35	8.41-35	1.53-34	2.77-34	5.02-34
23	0.00+00	1.01-36	1.23-36	1.78-36	2.80-36	4.75-36	8.51-36	1.57-35	2.91-35	5.38-35	9.90-35	1.81-34	3.32-34	6.14-34
22	0.00+00	1.16-36	1.43-36	2.12-36	3.40-36	5.79-36	1.03-35	1.87-35	3.44-35	6.33-35	1.16-34	2.15-34	4.00-34	7.59-34
21	0.00+00	1.34-36	1.68-36	2.53-36	4.12-36	7.03-36	1.24-35	2.23-35	4.06-35	7.43-35	1.37-34	2.55-34	4.85-34	9.52-34
20	0.00+00	1.55-36	1.97-36	3.03-36	4.98-36	8.50-36	1.49-35	2.65-35	4.78-35	8.72-35	1.61-34	3.05-34	5.94-34	1.22-33
19	0.00+00	1.82-36	2.32-36	3.62-36	6.01-36	1.03-35	1.78-35	3.15-35	5.63-35	1.02-34	1.91-34	3.66-34	7.37-34	1.60-33
18	0.00+00	2.14-36	2.76-36	4.36-36	7.28-36	1.24-35	2.15-35	3.76-35	6.68-35	1.21-34	2.27-34	4.43-34	9.24-34	2.15-33
17	0.00+00	2.54-36	3.31-36	5.28-36	8.88-36	1.52-35	2.62-35	4.56-35	8.06-35	1.46-34	2.72-34	5.33-34	1.11-33	2.46-33
16	0.00+00	3.06-36	4.01-36	6.46-36	1.10-35	1.89-35	3.27-35	5.68-35	9.98-35	1.78-34	3.24-34	5.74-34	6.44-34	-1.05-32
15	0.00+00	3.74-36	4.93-36	8.06-36	1.39-35	2.42-35	4.22-35	7.36-35	1.29-34	2.20-34	3.30-34	-9.89-35	-1.50-32	
14	0.00+00	4.65-36	6.20-36	1.03-35	1.81-35	3.21-35	5.72-35	1.01-34	1.74-34	2.48-34	-2.29-34	-1.48-32		
13	0.00+00	5.91-36	7.98-36	1.36-35	2.45-35	4.51-35	8.32-35	1.50-34	2.38-34	-6.71-35	-1.21-32			
12	0.00+00	7.68-36	1.06-35	1.86-35	3.51-35	6.81-35	1.33-34	2.45-34	1.84-34	-8.36-33				
11	0.00+00	1.03-35	1.46-35	2.68-35	5.40-35	1.14-34	2.43-34	4.04-34	-4.55-33					
10	0.00+00	1.43-35	2.11-35	4.15-35	9.19-35	2.21-34	5.31-34	-1.29-33						
9	0.00+00	2.09-35	3.27-35	7.08-35	1.83-34	5.51-34	1.04-33							
8	0.00+00	3.26-35	5.56-35	1.41-34	4.84-34	2.26-33								
7	0.00+00	5.59-35	1.10-34	3.77-34	2.48-33									
6	0.00+00	1.11-34	2.86-34	2.05-33										
5	0.00+00	2.88-34	1.48-33											
4	0.00+00	1.42-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-2.11-35	-2.89-35	-4.01-35	-5.61-35	-7.95-35	-1.14-34	-1.64-34	-2.37-34	-3.44-34	-4.98-34	-7.19-34	-1.04-33	-1.49-33	-2.12-33
45	-4.79-36	-4.97-36	-5.81-36	-8.40-36	-1.47-35	-2.48-35	-5.32-35	-9.93-35	-1.79-34	-3.12-34	-5.29-34	-8.75-34	-1.42-33	-2.28-33
40	3.25-35	5.15-35	7.80-35	1.14-34	1.61-34	2.20-34	2.92-34	3.74-34	4.60-34	5.35-34	5.70-34	5.07-34	2.38-34	-4.42-34
35	1.08-34	1.71-34	2.65-34	4.03-34	6.04-34	8.97-34	1.32-33	1.93-33	2.83-33	4.14-33	6.10-33	9.08-33	1.37-32	2.13-32
30	2.76-34	4.55-34	7.45-34	1.22-33	1.99-33	3.29-33	5.55-33	9.62-33	1.74-32	3.37-32	7.20-32	1.82-31	6.28-31	4.69-30
29	3.33-34	5.57-34	9.25-34	1.54-33	2.59-33	4.44-33	7.83-33	1.44-32	2.83-32	6.15-32	1.58-31	5.58-31	4.27-30	
28	4.04-34	6.84-34	1.16-33	1.98-33	3.45-33	6.16-33	1.15-32	2.29-32	5.05-32	1.32-31	4.72-31	3.67-30		
27	4.91-34	8.46-34	1.47-33	2.59-33	4.69-33	8.87-33	1.79-32	3.99-32	1.05-31	3.81-31	3.00-30			
26	6.00-34	1.06-33	1.89-33	3.46-33	6.61-33	1.35-32	3.03-32	8.07-32	2.94-31	2.33-30				
25	7.39-34	1.34-33	2.48-33	4.78-33	9.80-33	2.22-32	5.95-32	2.18-31	1.73-30					
24	9.19-34	1.72-33	3.34-33	6.90-33	1.57-32	4.21-32	1.54-31	1.21-30						
23	1.16-33	2.26-33	4.69-33	1.07-32	2.86-32	1.04-31	8.08-31							
22	1.49-33	3.09-33	7.01-33	1.86-32	6.67-32	5.09-31								
21	1.97-33	4.44-33	1.16-32	4.08-32	2.99-31									
20	2.71-33	6.95-33	2.35-32	1.63-31										
19	3.96-33	1.26-32	7.79-32											
18	6.08-33	2.86-32												
17	2.10-33													

H TE = 1.50+04 NE = 1.00+05 CASE B NC = 63

TOTAL RC = 1.842-13 4-2 RC = 2.114-14 4-2 EM = 8.641-26 2S RC = 6.305-14 2P RC = 1.212-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.53-04	2.31-04	9.93-05	5.14-05	3.00-05	1.90-05	1.28-05	9.02-06	6.59-06	4.96-06	3.83-06	3.02-06	2.42-06	1.97-06
45	1.01-03	3.09-04	1.33-04	6.88-05	4.01-05	2.54-05	1.71-05	1.21-05	8.82-06	6.64-06	5.12-06	4.04-06	3.24-06	2.63-06
40	1.37-03	4.22-04	1.81-04	9.40-05	5.49-05	3.48-05	2.34-05	1.65-05	1.21-05	9.08-06	7.01-06	5.52-06	4.42-06	3.60-06
35	1.93-03	5.92-04	2.55-04	1.32-04	7.71-05	4.89-05	3.29-05	2.32-05	1.70-05	1.28-05	9.86-06	7.77-06	6.22-06	5.07-06
30	2.85-03	8.75-04	3.77-04	1.96-04	1.14-04	7.26-05	4.89-05	3.45-05	2.52-05	1.90-05	1.47-05	1.16-05	9.27-06	7.54-06
29	3.11-03	9.56-04	4.12-04	2.14-04	1.25-04	7.94-05	5.35-05	3.77-05	2.76-05	2.08-05	1.61-05	1.27-05	1.01-05	8.25-06
28	3.41-03	1.05-03	4.52-04	2.35-04	1.37-04	8.72-05	5.88-05	4.15-05	3.04-05	2.29-05	1.77-05	1.39-05	1.12-05	9.08-06
27	3.75-03	1.15-03	4.98-04	2.59-04	1.52-04	9.63-05	6.50-05	4.59-05	3.36-05	2.53-05	1.95-05	1.54-05	1.23-05	1.00-05
26	4.14-03	1.28-03	5.51-04	2.87-04	1.68-04	1.07-04	7.21-05	5.09-05	3.73-05	2.81-05	2.17-05	1.71-05	1.37-05	1.12-05
25	4.59-03	1.42-03	6.13-04	3.20-04	1.87-04	1.19-04	8.05-05	5.69-05	4.17-05	3.14-05	2.43-05	1.91-05	1.54-05	1.25-05
24	5.12-03	1.58-03	6.85-04	3.57-04	2.10-04	1.34-04	9.03-05	6.39-05	4.69-05	3.54-05	2.73-05	2.15-05	1.73-05	1.41-05
23	5.72-03	1.77-03	7.69-04	4.02-04	2.36-04	1.51-04	1.02-04	7.22-05	5.30-05	4.00-05	3.09-05	2.44-05	1.96-05	1.59-05
22	6.42-03	1.99-03	8.67-04	4.54-04	2.68-04	1.71-04	1.16-04	8.22-05	6.03-05	4.56-05	3.53-05	2.78-05	2.23-05	1.81-05
21	7.25-03	2.25-03	9.83-04	5.17-04	3.05-04	1.95-04	1.33-04	9.42-05	6.92-05	5.24-05	4.05-05	3.20-05	2.56-05	2.08-05
20	8.22-03	2.56-03	1.12-03	5.92-04	3.51-04	2.25-04	1.53-04	1.09-04	8.01-05	6.06-05	4.69-05	3.70-05	2.96-05	2.40-05
19	9.38-03	2.93-03	1.29-03	6.83-04	4.06-04	2.61-04	1.78-04	1.27-04	9.35-05	7.08-05	5.48-05	4.32-05	3.46-05	2.79-05
18	1.08-02	3.37-03	1.49-03	7.96-04	4.75-04	3.07-04	2.10-04	1.49-04	1.10-04	8.35-05	6.46-05	5.09-05	4.05-05	3.25-05
17	1.25-02	3.93-03	1.75-03	9.37-04	5.62-04	3.64-04	2.49-04	1.78-04	1.31-04	9.94-05	7.69-05	6.03-05	4.77-05	3.76-05
16	1.47-02	4.62-03	2.07-03	1.12-03	6.72-04	4.37-04	3.00-04	2.14-04	1.58-04	1.20-04	9.21-05	7.17-05	5.58-05	4.14-05
15	1.75-02	5.50-03	2.49-03	1.35-03	8.16-04	5.32-04	3.66-04	2.61-04	1.93-04	1.45-04	1.11-04	8.49-05	6.20-05	
14	2.11-02	6.65-03	3.03-03	1.66-03	1.01-03	6.57-04	4.52-04	3.23-04	2.37-04	1.77-04	1.33-04	9.56-05		
13	2.58-02	8.20-03	3.77-03	2.07-03	1.26-03	8.25-04	5.67-04	4.04-04	2.94-04	2.16-04	1.52-04			
12	3.23-02	1.03-02	4.78-03	2.64-03	1.61-03	1.05-03	7.22-04	5.10-04	3.65-04	2.51-04				
11	4.13-02	1.33-02	6.22-03	3.44-03	2.10-03	1.37-03	9.33-04	6.47-04	4.34-04					
10	5.46-02	1.77-02	8.30-03	4.60-03	2.81-03	1.82-03	1.22-03	7.91-04						
9	7.48-02	2.44-02	1.14-02	6.34-03	3.85-03	2.45-03	1.54-03							
8	1.07-01	3.49-02	1.64-02	9.06-03	5.42-03	3.24-03								
7	1.62-01	5.27-02	2.47-02	1.35-02	7.59-03									
6	2.63-01	8.51-02	3.95-02	2.04-02										
5	4.74-01	1.51-01	6.64-02											
4	1.00+00	2.97-01												
3	2.77+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.62-06	1.36-06	1.14-06	9.72-07	8.34-07	7.20-07	6.27-07	5.48-07	4.83-07	4.27-07	3.80-07	3.39-07	3.04-07	2.73-07
45	2.17-06	1.81-06	1.53-06	1.30-06	1.11-06	9.62-07	8.37-07	7.32-07	6.45-07	5.70-07	5.06-07	4.52-07	4.05-07	3.64-07
40	2.97-06	2.48-06	2.09-06	1.77-06	1.52-06	1.31-06	1.14-06	9.99-07	8.79-07	7.77-07	6.90-07	6.15-07	5.51-07	4.95-07
35	4.18-06	3.48-06	2.93-06	2.49-06	2.14-06	1.85-06	1.60-06	1.40-06	1.23-06	1.09-06	9.64-07	8.57-07	7.65-07	6.84-07
30	6.21-06	5.18-06	4.36-06	3.71-06	3.17-06	2.73-06	2.37-06	2.07-06	1.81-06	1.59-06	1.39-06	1.22-06	1.05-06	8.61-07
29	6.80-06	5.67-06	4.77-06	4.05-06	3.47-06	2.99-06	2.59-06	2.25-06	1.97-06	1.72-06	1.50-06	1.29-06	1.05-06	
28	7.48-06	6.24-06	5.25-06	4.46-06	3.81-06	3.28-06	2.84-06	2.46-06	2.14-06	1.86-06	1.59-06	1.29-06		
27	8.28-06	6.90-06	5.80-06	4.92-06	4.20-06	3.61-06	3.12-06	2.70-06	2.33-06	1.99-06	1.60-06			
26	9.20-06	7.66-06	6.44-06	5.46-06	4.66-06	4.00-06	3.44-06	2.95-06	2.50-06	2.01-06				
25	1.03-05	8.56-06	7.20-06	6.09-06	5.19-06	4.43-06	3.78-06	3.19-06	2.55-06					
24	1.16-05	9.63-06	8.08-06	6.82-06	5.79-06	4.91-06	4.12-06	3.28-06						
23	1.31-05	1.09-05	9.11-06	7.67-06	6.46-06	5.39-06	4.26-06							
22	1.49-05	1.24-05	1.03-05	8.63-06	7.15-06	5.61-06								
21	1.71-05	1.41-05	1.17-05	9.62-06	7.50-06									
20	1.97-05	1.61-05	1.32-05	1.02-05										
19	2.27-05	1.83-05	1.40-05											
18	2.60-05	1.97-05												
17	2.83-05													

II TE = 1.50+04 NE = 1.00+05 CASE B NC = 63

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	7.47-38	2.04-38	-1.23-37	-4.46-37	-1.06-36	-2.13-36	-3.85-36	-6.54-36	-1.06-35	-1.67-35	-2.56-35	-3.86-35	-5.73-35
45	0.00+00	1.05-37	3.78-38	-1.40-37	-5.42-37	-1.31-36	-2.63-36	-4.78-36	-8.15-36	-1.33-35	-2.10-35	-3.25-35	-4.95-35	-7.44-35
40	0.00+00	1.55-37	7.63-38	-1.32-37	-6.06-37	-1.51-36	-3.06-36	-5.56-36	-9.47-36	-1.55-35	-2.46-35	-3.85-35	-5.95-35	-9.11-35
35	0.00+00	2.43-37	1.62-37	-5.27-38	-5.45-37	-1.46-36	-3.00-36	-5.41-36	-9.09-36	-1.47-35	-2.33-35	-3.66-35	-5.76-35	-9.09-35
30	0.00+00	4.09-37	3.43-37	1.76-37	-2.16-37	-8.91-37	-1.86-36	-3.10-36	-4.53-36	-6.17-36	-8.19-36	-1.12-35	-1.67-35	-2.82-35
29	0.00+00	4.57-37	3.98-37	2.48-37	-1.06-37	-6.93-37	-1.46-36	-2.28-36	-2.89-36	-3.03-36	-2.41-36	-1.03-36	5.20-37	1.02-37
28	0.00+00	5.13-37	4.62-37	3.33-37	2.40-38	-4.60-37	-9.94-37	-1.30-36	-9.25-37	7.88-37	4.69-36	1.17-35	2.26-35	3.74-35
27	0.00+00	5.79-37	5.37-37	4.34-37	1.78-37	-1.81-37	-4.32-37	-1.38-37	1.44-36	5.44-36	1.35-35	2.78-35	5.13-35	8.72-35
26	0.00+00	6.55-37	6.26-37	5.55-37	3.66-37	1.59-37	2.51-37	1.28-36	4.35-36	1.12-35	2.46-35	4.85-35	8.91-35	1.55-34
25	0.00+00	7.44-37	7.32-37	7.03-37	6.01-37	5.85-37	1.10-36	3.05-36	7.99-36	1.85-35	3.88-35	7.58-35	1.40-34	2.50-34
24	0.00+00	8.51-37	8.61-37	8.89-37	9.00-37	1.13-36	2.20-36	5.32-36	1.27-35	2.80-35	5.77-35	1.13-34	2.12-34	3.88-34
23	0.00+00	9.79-37	1.02-36	1.12-36	1.29-36	1.85-36	3.64-36	8.28-36	1.88-35	4.05-35	8.31-35	1.64-34	3.14-34	5.96-34
22	0.00+00	1.13-36	1.21-36	1.42-36	1.80-36	2.81-36	5.54-36	1.22-35	2.70-35	5.74-35	1.18-34	2.36-34	4.66-34	9.23-34
21	0.00+00	1.32-36	1.46-36	1.81-36	2.48-36	4.08-36	8.09-36	1.75-35	3.79-35	8.05-35	1.67-34	3.42-34	7.00-34	1.46-33
20	0.00+00	1.55-36	1.77-36	2.31-36	3.37-36	5.79-36	1.15-35	2.45-35	5.28-35	1.12-34	2.37-34	5.01-34	1.08-33	2.42-33
19	0.00+00	1.83-36	2.15-36	2.97-36	4.56-36	8.07-36	1.61-35	3.40-35	7.31-35	1.57-34	3.40-34	7.49-34	1.72-33	4.30-33
18	0.00+00	2.19-36	2.65-36	3.81-36	6.13-36	1.11-35	2.22-35	4.68-35	1.01-34	2.22-34	4.97-34	1.16-33	2.94-33	8.64-33
17	0.00+00	2.63-36	3.27-36	4.92-36	8.21-36	1.52-35	3.04-35	6.43-35	1.41-34	3.17-34	7.47-34	1.90-33	5.61-33	2.21-32
16	0.00+00	3.19-36	4.08-36	6.36-36	1.10-35	2.06-35	4.16-35	8.86-35	1.97-34	4.63-34	1.18-33	3.44-33	1.33-32	1.05-31
15	0.00+00	3.91-36	5.12-36	8.26-36	1.47-35	2.80-35	5.70-35	1.23-34	2.83-34	7.06-34	2.02-33	7.49-33	5.45-32	
14	0.00+00	4.86-36	6.50-36	1.08-35	1.97-35	3.83-35	7.91-35	1.75-34	4.20-34	1.15-33	3.99-33	2.51-32		
13	0.00+00	6.14-36	8.39-36	1.44-35	2.69-35	5.33-35	1.13-34	2.58-34	6.62-34	2.07-33	9.75-33			
12	0.00+00	7.94-36	1.11-35	1.95-35	3.77-35	7.74-35	1.70-34	4.09-34	1.13-33	2.84-33				
11	0.00+00	1.06-35	1.51-35	2.77-35	5.60-35	1.22-34	2.85-34	7.21-34	5.56-34					
10	0.00+00	1.46-35	2.15-35	4.18-35	9.14-35	2.19-34	5.72-34	4.70-34						
9	0.00+00	2.12-35	3.29-35	6.97-35	1.74-34	5.07-34	1.20-33							
8	0.00+00	3.28-35	5.55-35	1.36-34	4.41-34	1.88-33								
7	0.00+00	5.61-35	1.09-34	3.56-34	2.11-33									
6	0.00+00	1.11-34	2.81-34	1.86-33										
5	0.00+00	2.88-34	1.43-33											
4	0.00+00	1.42-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-8.39-35	-1.21-34	-1.74-34	-2.46-34	-3.46-34	-4.80-34	-6.61-34	-9.03-34	-1.22-33	-1.65-33	-2.20-33	-2.92-33	-3.85-33	-5.05-33
45	-1.11-34	-1.63-34	-2.38-34	-3.44-34	-4.94-34	-7.03-34	-9.95-34	-1.40-33	-1.95-33	-2.71-33	-3.76-33	-5.19-33	-7.14-33	-9.80-33
40	-1.39-34	-2.10-34	-3.16-34	-4.73-34	-7.04-34	-1.04-33	-1.54-33	-2.27-33	-3.33-33	-4.90-33	-7.22-33	-1.07-32	-1.58-32	-2.37-32
35	-1.44-34	-2.29-34	-3.66-34	-5.85-34	-9.35-34	-1.49-33	-2.32-33	-3.85-33	-6.25-33	-1.03-32	-1.72-32	-2.94-32	-5.19-32	-9.61-32
30	-5.28-35	-1.05-34	-2.12-34	-4.26-34	-8.52-34	-1.70-33	-3.39-33	-6.92-33	-1.46-32	-3.29-32	-8.19-32	-2.41-31	-9.74-31	-8.64-30
29	-7.82-36	-3.57-35	-1.10-34	-2.86-34	-6.78-34	-1.54-33	-3.44-33	-7.81-33	-1.86-32	-4.85-32	-1.49-31	-6.26-31	-5.77-30	
28	5.35-35	6.25-35	4.27-35	-5.73-35	-3.58-34	-1.15-33	-3.20-33	-8.67-33	-2.48-32	-8.16-32	-3.64-31	-3.53-30		
27	1.38-34	2.05-34	2.76-34	3.20-34	2.31-34	-2.92-34	-2.20-33	-8.88-33	-3.53-32	-1.78-31	-1.89-30			
26	2.59-34	4.16-34	6.46-34	9.66-34	1.36-33	1.68-33	1.04-33	-5.34-33	-5.36-32	-7.58-31				
25	4.35-34	7.43-34	1.26-33	2.15-33	3.71-33	5.64-33	1.24-32	2.31-32	-3.11-32					
24	7.04-34	1.28-33	2.35-33	4.49-33	9.21-33	2.15-32	6.55-32	3.93-31						
23	1.13-33	2.20-33	4.45-33	9.75-33	2.47-32	8.40-32	6.01-31							
22	1.86-33	3.94-33	9.02-33	2.40-32	8.62-32	6.61-31								
21	3.20-33	7.59-33	2.10-32	7.80-32	6.22-31									
20	5.92-33	1.60-32	6.43-32	5.25-31										
19	1.25-32	4.87-32	4.04-31											
18	3.41-32	2.83-31												
17	1.81-31													

H TE = 1.50+04 NE = 1.00+06 CASE B NC = 40

TOTAL RC = 1.850-13 4-2 RC = 2.123-14 4-2 EN = 8.675-26 2S RC = 6.337-14 2P RC = 1.217-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.76-04	2.38-04	1.02-04	5.30-05	3.09-05	1.96-05	1.32-05	9.29-06	6.79-06	5.12-06	3.95-06	3.11-06	2.49-06	2.03-06
45	1.06-03	3.25-04	1.40-04	7.23-05	4.22-05	2.67-05	1.80-05	1.27-05	9.26-06	6.97-06	5.38-06	4.24-06	3.40-06	2.76-06
40	1.49-03	4.57-04	1.96-04	1.02-04	5.93-05	3.76-05	2.53-05	1.78-05	1.30-05	9.80-06	7.56-06	5.95-06	4.77-06	3.88-06
35	2.17-03	6.65-04	2.86-04	1.48-04	8.63-05	5.47-05	3.68-05	2.59-05	1.89-05	1.43-05	1.10-05	8.66-06	6.94-06	5.64-06
30	3.27-03	1.00-03	4.32-04	2.24-04	1.30-04	8.26-05	5.56-05	3.91-05	2.86-05	2.15-05	1.66-05	1.31-05	1.05-05	8.51-06
29	3.57-03	1.10-03	4.71-04	2.44-04	1.42-04	9.01-05	6.06-05	4.27-05	3.12-05	2.35-05	1.81-05	1.42-05	1.14-05	9.28-06
28	3.90-03	1.20-03	5.15-04	2.67-04	1.56-04	9.85-05	6.63-05	4.67-05	3.41-05	2.57-05	1.98-05	1.56-05	1.25-05	1.01-05
27	4.28-03	1.31-03	5.64-04	2.92-04	1.70-04	1.08-04	7.26-05	5.11-05	3.74-05	2.81-05	2.17-05	1.71-05	1.37-05	1.11-05
26	4.69-03	1.44-03	6.19-04	3.21-04	1.87-04	1.19-04	7.98-05	5.62-05	4.11-05	3.09-05	2.38-05	1.87-05	1.50-05	1.22-05
25	5.17-03	1.59-03	6.83-04	3.54-04	2.06-04	1.31-04	8.80-05	6.20-05	4.53-05	3.41-05	2.62-05	2.06-05	1.65-05	1.34-05
24	5.72-03	1.76-03	7.56-04	3.92-04	2.29-04	1.45-04	9.74-05	6.86-05	5.01-05	3.77-05	2.91-05	2.29-05	1.83-05	1.48-05
23	6.36-03	1.95-03	8.41-04	4.36-04	2.54-04	1.61-04	1.08-04	7.64-05	5.58-05	4.20-05	3.23-05	2.54-05	2.03-05	1.65-05
22	7.12-03	2.19-03	9.42-04	4.88-04	2.85-04	1.81-04	1.22-04	8.56-05	6.26-05	4.71-05	3.62-05	2.85-05	2.28-05	1.84-05
21	8.03-03	2.47-03	1.06-03	5.51-04	3.22-04	2.04-04	1.37-04	9.67-05	7.07-05	5.31-05	4.09-05	3.22-05	2.57-05	2.08-05
20	9.11-03	2.80-03	1.21-03	6.27-04	3.66-04	2.32-04	1.56-04	1.10-04	8.05-05	6.06-05	4.66-05	3.66-05	2.92-05	2.36-05
19	1.04-02	3.21-03	1.38-03	7.20-04	4.21-04	2.67-04	1.80-04	1.27-04	9.26-05	6.96-05	5.36-05	4.20-05	3.34-05	2.69-05
18	1.20-02	3.71-03	1.60-03	8.34-04	4.88-04	3.10-04	2.09-04	1.47-04	1.08-04	8.09-05	6.22-05	4.87-05	3.86-05	3.09-05
17	1.40-02	4.32-03	1.87-03	9.75-04	5.72-04	3.64-04	2.45-04	1.73-04	1.26-04	9.50-05	7.29-05	5.69-05	4.49-05	3.53-05
16	1.64-02	5.07-03	2.20-03	1.15-03	6.77-04	4.32-04	2.92-04	2.06-04	1.50-04	1.13-04	8.64-05	6.70-05	5.20-05	3.85-05
15	1.94-02	6.03-03	2.63-03	1.38-03	8.13-04	5.19-04	3.51-04	2.48-04	1.81-04	1.36-04	1.03-04	7.88-05	5.76-05	
14	2.33-02	7.24-03	3.17-03	1.67-03	9.90-04	6.34-04	4.30-04	3.04-04	2.21-04	1.65-04	1.24-04	8.89-05		
13	2.84-02	8.83-03	3.89-03	2.07-03	1.23-03	7.89-04	5.35-04	3.78-04	2.74-04	2.01-04	1.42-04			
12	3.51-02	1.10-02	4.87-03	2.60-03	1.56-03	1.00-03	6.79-04	4.77-04	3.41-04	2.35-04				
11	4.45-02	1.39-02	6.24-03	3.36-03	2.02-03	1.30-03	8.79-04	6.08-04	4.09-04					
10	5.80-02	1.82-02	8.25-03	4.47-03	2.69-03	1.73-03	1.15-03	7.48-04						
9	7.81-02	2.46-02	1.13-02	6.16-03	3.70-03	2.34-03	1.46-03							
8	1.10-01	3.50-02	1.62-02	8.80-03	5.21-03	3.10-03								
7	1.64-01	5.25-02	2.43-02	1.31-02	7.27-03									
6	2.64-01	8.45-02	3.87-02	1.96-02										
5	4.75-01	1.49-01	6.45-02											
4	1.00+00	2.92-01												
3	2.75+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.67-06	1.40-06	1.18-06	1.00-06	8.58-07	7.42-07	6.45-07	5.65-07	4.97-07	4.40-07	3.91-07	3.49-07	3.13-07	2.81-07
45	2.28-06	1.90-06	1.60-06	1.36-06	1.17-06	1.01-06	8.78-07	7.68-07	6.76-07	5.98-07	5.31-07	4.74-07	4.24-07	3.82-07
40	3.20-06	2.67-06	2.25-06	1.91-06	1.64-06	1.42-06	1.23-06	1.08-06	9.47-07	8.37-07	7.43-07	6.62-07	5.93-07	5.32-07
35	4.65-06	3.88-06	3.27-06	2.78-06	2.38-06	2.05-06	1.78-06	1.56-06	1.37-06	1.21-06	1.07-06	9.52-07	8.49-07	7.59-07
30	7.01-06	5.84-06	4.91-06	4.17-06	3.57-06	3.07-06	2.66-06	2.32-06	2.03-06	1.78-06	1.56-06	1.37-06	1.18-06	9.63-07
29	7.64-06	6.36-06	5.35-06	4.54-06	3.88-06	3.34-06	2.89-06	2.52-06	2.20-06	1.92-06	1.67-06	1.46-06	1.17-06	
28	8.34-06	6.95-06	5.84-06	4.95-06	4.23-06	3.64-06	3.15-06	2.73-06	2.37-06	2.06-06	1.76-06	1.43-06		
27	9.13-06	7.60-06	6.39-06	5.41-06	4.62-06	3.97-06	3.42-06	2.96-06	2.55-06	2.18-06	1.75-06			
26	1.00-05	8.34-06	7.00-06	5.93-06	5.05-06	4.33-06	3.72-06	3.19-06	2.71-06	2.17-06				
25	1.10-05	9.17-06	7.70-06	6.51-06	5.53-06	4.72-06	4.03-06	3.40-06	2.71-06					
24	1.22-05	1.01-05	8.48-06	7.16-06	6.06-06	5.14-06	4.31-06	3.42-06						
23	1.35-05	1.12-05	9.39-06	7.89-06	6.64-06	5.53-06	4.36-06							
22	1.51-05	1.25-05	1.04-05	8.70-06	7.19-06	5.64-06								
21	1.70-05	1.40-05	1.16-05	9.51-06	7.40-06									
20	1.92-05	1.57-05	1.28-05	9.88-06										
19	2.18-05	1.75-05	1.34-05											
18	2.46-05	1.86-05												
17	2.65-05													

H TE = 1.50+04 NE = 1.00+06 CASE B NC = 40

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	7.27-38	9.38-39	-1.62-37	-5.57-37	-1.33-36	-2.73-36	-5.09-36	-8.87-36	-1.47-35	-2.36-35	-3.65-35	-5.51-35	-8.12-35
45	0.00+00	1.01-37	1.50-38	-2.18-37	-7.56-37	-1.82-36	-3.76-36	-7.04-36	-1.24-35	-2.07-35	-3.34-35	-5.24-35	-8.00-35	-1.19-34
40	0.00+00	1.45-37	2.84-38	-2.92-37	-1.04-36	-2.53-36	-5.26-36	-9.95-36	-1.77-35	-2.99-35	-4.90-35	-7.79-35	-1.21-34	-1.84-34
35	0.00+00	2.23-37	6.30-38	-3.79-37	-1.42-36	-3.54-36	-7.44-36	-1.43-35	-2.57-35	-4.44-35	-7.41-35	-1.21-34	-1.93-34	-3.02-34
30	0.00+00	3.72-37	1.67-37	-4.10-37	-1.80-36	-4.66-36	-1.01-35	-1.97-35	-3.64-35	-6.45-35	-1.11-34	-1.89-34	-3.15-34	-5.21-34
29	0.00+00	4.17-37	2.06-37	-3.91-37	-1.84-36	-4.83-36	-1.05-35	-2.07-35	-3.84-35	-6.87-35	-1.20-34	-2.05-34	-3.47-34	-5.82-34
28	0.00+00	4.70-37	2.55-37	-3.57-37	-1.85-36	-4.96-36	-1.09-35	-2.15-35	-4.03-35	-7.27-35	-1.28-34	-2.22-34	-3.81-34	-6.51-34
27	0.00+00	5.33-37	3.16-37	-3.03-37	-1.83-36	-5.01-36	-1.11-35	-2.22-35	-4.18-35	-7.61-35	-1.36-34	-2.39-34	-4.17-34	-7.26-34
26	0.00+00	6.07-37	3.93-37	-2.24-37	-1.76-36	-4.98-36	-1.12-35	-2.25-35	-4.28-35	-7.87-35	-1.42-34	-2.54-34	-4.54-34	-8.10-34
25	0.00+00	6.94-37	4.87-37	-1.15-37	-1.64-36	-4.84-36	-1.10-35	-2.24-35	-4.30-35	-8.01-35	-1.47-34	-2.68-34	-4.90-34	-9.00-34
24	0.00+00	7.99-37	6.04-37	2.94-38	-1.45-36	-4.58-36	-1.06-35	-2.18-35	-4.24-35	-7.99-35	-1.49-34	-2.79-34	-5.25-34	-1.00-33
23	0.00+00	9.24-37	7.47-37	2.15-37	-1.19-36	-4.18-36	-9.94-36	-2.07-35	-4.06-35	-7.77-35	-1.48-34	-2.85-34	-5.56-34	-1.11-33
22	0.00+00	1.08-36	9.22-37	4.48-37	-8.53-37	-3.62-36	-8.94-36	-1.89-35	-3.75-35	-7.30-35	-1.43-34	-2.84-34	-5.82-34	-1.23-33
21	0.00+00	1.26-36	1.14-36	7.40-37	-4.15-37	-2.87-36	-7.56-36	-1.63-35	-3.27-35	-6.47-35	-1.30-34	-2.73-34	-5.95-34	-1.36-33
20	0.00+00	1.48-36	1.40-36	1.11-36	1.51-37	-1.89-36	-5.67-36	-1.25-35	-2.54-35	-5.10-35	-1.07-34	-2.40-34	-5.76-34	-1.49-33
19	0.00+00	1.76-36	1.74-36	1.59-36	9.06-37	-5.32-37	-2.99-36	-7.02-36	-1.39-35	-2.78-35	-6.21-35	-1.61-34	-4.69-34	-1.52-33
18	0.00+00	2.11-36	2.18-36	2.22-36	1.95-36	1.41-36	9.97-37	1.59-36	5.03-36	1.39-35	2.87-35	3.28-35	-8.01-35	-9.22-34
17	0.00+00	2.55-36	2.75-36	3.10-36	3.46-36	4.33-36	7.22-36	1.56-35	3.79-35	9.30-35	2.25-34	5.41-34	1.35-33	3.77-33
16	0.00+00	3.13-36	3.52-36	4.34-36	5.70-36	8.86-36	1.73-35	3.95-35	9.80-35	2.54-34	6.91-34	2.09-33	8.11-33	6.31-32
15	0.00+00	3.90-36	4.57-36	6.13-36	9.09-36	1.60-35	3.40-35	8.18-35	2.19-34	6.12-34	1.99-33	8.46-33	7.40-32	
14	0.00+00	4.92-36	6.04-36	8.76-36	1.44-35	2.77-35	6.27-35	1.61-34	4.61-34	1.54-33	6.85-33	6.30-32		
13	0.00+00	6.33-36	8.13-36	1.27-35	2.27-35	4.73-35	1.14-34	3.19-34	1.06-33	4.74-33	4.39-32			
12	0.00+00	8.28-36	1.12-35	1.87-35	3.62-35	8.14-35	2.15-34	6.83-34	2.95-33	2.62-32				
11	0.00+00	1.11-35	1.57-35	2.82-35	5.93-35	1.46-34	4.33-34	1.73-33	1.37-32					
10	0.00+00	1.53-35	2.27-35	4.42-35	1.02-34	2.82-34	1.03-33	6.76-33						
9	0.00+00	2.21-35	3.46-35	7.39-35	1.93-34	6.53-34	3.58-33							
8	0.00+00	3.39-35	5.73-35	1.40-34	4.60-34	2.39-33								
7	0.00+00	5.71-35	1.10-34	3.48-34	1.99-33									
6	0.00+00	1.12-34	2.77-34	1.70-33										
5	0.00+00	2.89-34	1.37-33											
4	0.00+00	1.41-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.17-34	-1.66-34	-2.30-34	-3.14-34	-4.21-34	-5.54-34	-7.17-34	-9.13-34	-1.14-33	-1.41-33	-1.72-33	-2.08-33	-2.49-33	-2.97-33
45	-1.75-34	-2.51-34	-3.54-34	-4.92-34	-6.74-34	-9.07-34	-1.20-33	-1.57-33	-2.02-33	-2.57-33	-3.24-33	-4.06-33	-5.08-33	-6.34-33
40	-2.75-34	-4.05-34	-5.87-34	-8.39-34	-1.18-33	-1.65-33	-2.27-33	-3.08-33	-4.15-33	-5.56-33	-7.41-33	-9.88-33	-1.33-32	-1.80-32
35	-4.67-34	-7.13-34	-1.08-33	-1.61-33	-2.39-33	-3.53-33	-5.19-33	-7.59-33	-1.11-32	-1.64-32	-2.44-32	-3.72-32	-5.87-32	-9.73-32
30	-8.54-34	-1.39-33	-2.27-33	-3.71-33	-6.10-33	-1.01-32	-1.71-32	-2.96-32	-5.33-32	-1.02-31	-2.17-31	-5.45-31	-1.89-30	-1.44-29
29	-9.71-34	-1.62-33	-2.70-33	-4.53-33	-7.70-33	-1.33-32	-2.36-32	-4.35-32	-8.53-32	-1.85-31	-4.72-31	-1.66-30	-1.29-29	
28	-1.11-33	-1.89-33	-3.24-33	-5.62-33	-9.94-33	-1.81-32	-3.42-32	-6.86-32	-1.52-31	-3.97-31	-1.43-30	-1.12-29		
27	-1.27-33	-2.22-33	-3.94-33	-7.12-33	-1.33-32	-2.57-32	-5.29-32	-1.20-31	-3.22-31	-1.18-30	-9.46-30			
26	-1.45-33	-2.63-33	-4.87-33	-9.27-33	-1.84-32	-3.90-32	-9.08-32	-2.50-31	-9.39-31	-7.70-30				
25	-1.67-33	-3.16-33	-6.16-33	-1.25-32	-2.72-32	-6.52-32	-1.84-31	-7.12-31	-6.00-30					
24	-1.94-33	-3.87-33	-8.06-33	-1.79-32	-4.41-32	-1.28-31	-5.11-31	-4.43-30						
23	-2.27-33	-4.86-33	-1.11-32	-2.80-32	-8.38-32	-3.44-31	-3.08-30							
22	-2.71-33	-6.38-33	-1.66-32	-5.10-32	-2.16-31	-2.00-30								
21	-3.33-33	-8.98-33	-2.86-32	-1.25-31	-1.20-30									
20	-4.25-33	-1.42-32	-6.51-32	-6.51-31										
19	-5.67-33	-2.83-32	-3.04-31											
18	-7.16-33	-9.86-32												
17	1.30-32													

H TE = 1.50+04 NE = 1.00+07 CASE B NC = 25

TOTAL RC = 1.865-13 4-2 RC = 2.139-14 4-2 EM = 8.741-26 2S RC = 6.392-14 2P RC = 1.226-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.76-04	2.38-04	1.02-04	5.30-05	3.09-05	1.96-05	1.32-05	9.29-06	6.79-06	5.11-06	3.95-06	3.11-06	2.49-06	2.03-06
45	1.06-03	3.26-04	1.40-04	7.27-05	4.24-05	2.68-05	1.81-05	1.27-05	9.31-06	7.01-06	5.41-06	4.26-06	3.41-06	2.78-06
40	1.51-03	4.64-04	1.99-04	1.03-04	6.02-05	3.82-05	2.57-05	1.81-05	1.32-05	9.95-06	7.68-06	6.05-06	4.85-06	3.94-06
35	2.25-03	6.90-04	2.96-04	1.54-04	8.95-05	5.67-05	3.81-05	2.69-05	1.96-05	1.48-05	1.14-05	8.97-06	7.19-06	5.85-06
30	3.53-03	1.08-03	4.65-04	2.41-04	1.40-04	8.89-05	5.98-05	4.21-05	3.08-05	2.31-05	1.78-05	1.40-05	1.12-05	9.14-06
29	3.89-03	1.19-03	5.13-04	2.65-04	1.55-04	9.80-05	6.59-05	4.64-05	3.39-05	2.55-05	1.97-05	1.55-05	1.24-05	1.01-05
28	4.30-03	1.32-03	5.67-04	2.93-04	1.71-04	1.08-04	7.28-05	5.13-05	3.74-05	2.82-05	2.17-05	1.71-05	1.37-05	1.11-05
27	4.77-03	1.46-03	6.28-04	3.25-04	1.90-04	1.20-04	8.06-05	5.68-05	4.15-05	3.12-05	2.40-05	1.89-05	1.51-05	1.23-05
26	5.30-03	1.63-03	6.98-04	3.61-04	2.11-04	1.33-04	8.96-05	6.31-05	4.60-05	3.46-05	2.67-05	2.10-05	1.68-05	1.36-05
25	5.88-03	1.80-03	7.75-04	4.01-04	2.34-04	1.48-04	9.95-05	7.01-05	5.11-05	3.85-05	2.96-05	2.33-05	1.86-05	1.51-05
24	6.57-03	2.01-03	8.65-04	4.48-04	2.61-04	1.65-04	1.11-04	7.82-05	5.70-05	4.29-05	3.30-05	2.60-05	2.08-05	1.68-05
23	7.35-03	2.25-03	9.68-04	5.01-04	2.92-04	1.85-04	1.24-04	8.74-05	6.38-05	4.79-05	3.69-05	2.90-05	2.32-05	1.88-05
22	8.25-03	2.53-03	1.09-03	5.62-04	3.28-04	2.07-04	1.39-04	9.80-05	7.15-05	5.37-05	4.13-05	3.25-05	2.59-05	2.10-05
21	9.28-03	2.84-03	1.22-03	6.32-04	3.68-04	2.33-04	1.57-04	1.10-04	8.04-05	6.04-05	4.64-05	3.64-05	2.91-05	2.35-05
20	1.05-02	3.21-03	1.38-03	7.14-04	4.16-04	2.63-04	1.77-04	1.24-04	9.06-05	6.80-05	5.23-05	4.10-05	3.26-05	2.63-05
19	1.19-02	3.64-03	1.56-03	8.09-04	4.71-04	2.98-04	2.00-04	1.41-04	1.03-04	7.70-05	5.91-05	4.63-05	3.68-05	2.96-05
18	1.35-02	4.15-03	1.78-03	9.23-04	5.38-04	3.40-04	2.28-04	1.60-04	1.17-04	8.76-05	6.72-05	5.25-05	4.15-05	3.31-05
17	1.56-02	4.77-03	2.05-03	1.06-03	6.19-04	3.91-04	2.63-04	1.84-04	1.34-04	1.00-04	7.69-05	5.98-05	4.70-05	3.69-05
16	1.81-02	5.55-03	2.39-03	1.24-03	7.20-04	4.55-04	3.05-04	2.14-04	1.56-04	1.16-04	8.88-05	6.86-05	5.30-05	3.92-05
15	2.13-02	6.55-03	2.82-03	1.46-03	8.50-04	5.37-04	3.60-04	2.53-04	1.83-04	1.36-04	1.03-04	7.85-05	5.72-05	
14	2.55-02	7.84-03	3.37-03	1.75-03	1.02-03	6.45-04	4.32-04	3.03-04	2.19-04	1.62-04	1.21-04	8.63-05		
13	3.11-02	9.55-03	4.12-03	2.14-03	1.25-03	7.88-04	5.27-04	3.68-04	2.65-04	1.93-04	1.35-04			
12	3.85-02	1.18-02	5.11-03	2.66-03	1.55-03	9.82-04	6.56-04	4.56-04	3.23-04	2.21-04				
11	4.86-02	1.50-02	6.49-03	3.38-03	1.98-03	1.25-03	8.33-04	5.70-04	3.81-04					
10	6.29-02	1.94-02	8.45-03	4.42-03	2.59-03	1.64-03	1.07-03	6.95-04						
9	8.40-02	2.59-02	1.14-02	5.98-03	3.51-03	2.19-03	1.36-03							
8	1.17-01	3.60-02	1.59-02	8.42-03	4.90-03	2.89-03								
7	1.72-01	5.28-02	2.36-02	1.24-02	6.84-03									
6	2.71-01	8.38-02	3.73-02	1.86-02										
5	4.79-01	1.47-01	6.19-02											
4	1.00+00	2.84-01												
3	2.73+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.67-06	1.40-06	1.18-06	1.00-06	8.58-07	7.41-07	6.45-07	5.64-07	4.97-07	4.39-07	3.91-07	3.49-07	3.12-07	2.81-07
45	2.29-06	1.91-06	1.61-06	1.37-06	1.17-06	1.01-06	8.82-07	7.72-07	6.79-07	6.01-07	5.34-07	4.76-07	4.27-07	3.83-07
40	3.25-06	2.71-06	2.28-06	1.94-06	1.66-06	1.44-06	1.25-06	1.09-06	9.61-07	8.49-07	7.54-07	6.72-07	6.02-07	5.40-07
35	4.82-06	4.02-06	3.38-06	2.87-06	2.46-06	2.12-06	1.85-06	1.61-06	1.42-06	1.25-06	1.11-06	9.85-07	8.78-07	7.85-07
30	7.52-06	6.27-06	5.27-06	4.47-06	3.83-06	3.30-06	2.86-06	2.49-06	2.17-06	1.91-06	1.67-06	1.46-06	1.26-06	1.03-06
29	8.28-06	6.90-06	5.80-06	4.92-06	4.21-06	3.62-06	3.13-06	2.72-06	2.38-06	2.07-06	1.81-06	1.55-06	1.26-06	
28	9.14-06	7.61-06	6.39-06	5.42-06	4.63-06	3.98-06	3.44-06	2.98-06	2.59-06	2.25-06	1.92-06	1.56-06		
27	1.01-05	8.41-06	7.06-06	5.98-06	5.11-06	4.38-06	3.78-06	3.26-06	2.81-06	2.40-06	1.93-06			
26	1.12-05	9.31-06	7.82-06	6.62-06	5.64-06	4.83-06	4.14-06	3.55-06	3.01-06	2.41-06				
25	1.24-05	1.03-05	8.66-06	7.32-06	6.22-06	5.30-06	4.52-06	3.81-06	3.04-06					
24	1.38-05	1.15-05	9.61-06	8.10-06	6.86-06	5.81-06	4.87-06	3.86-06						
23	1.54-05	1.28-05	1.07-05	8.96-06	7.53-06	6.27-06	4.94-06							
22	1.72-05	1.42-05	1.18-05	9.86-06	8.15-06	6.38-06								
21	1.92-05	1.58-05	1.31-05	1.07-05	8.33-06									
20	2.14-05	1.75-05	1.42-05	1.10-05										
19	2.39-05	1.92-05	1.47-05											
18	2.63-05	1.99-05												
17	2.76-05													

H TE = 1.50+04 NE = 1.00+07 CASE B NC = 25

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	7.23-38	3.45-39	-1.90-37	-6.45-37	-1.56-36	-3.18-36	-5.87-36	-1.01-35	-1.65-35	-2.57-35	-3.87-35	-5.61-35	-7.84-35
45	0.00+00	9.95-38	4.71-39	-2.62-37	-8.96-37	-2.17-36	-4.46-36	-8.29-36	-1.44-35	-2.37-35	-3.73-35	-5.67-35	-8.31-35	-1.18-34
40	0.00+00	1.42-37	7.17-39	-3.76-37	-1.29-36	-3.16-36	-6.54-36	-1.23-35	-2.15-35	-3.58-35	-5.73-35	-8.84-35	-1.32-34	-1.90-34
35	0.00+00	2.14-37	1.35-38	-5.63-37	-1.96-36	-4.83-36	-1.01-35	-1.92-35	-3.43-35	-5.82-35	-9.50-35	-1.50-34	-2.30-34	-3.42-34
30	0.00+00	3.46-37	3.57-38	-8.73-37	-3.11-36	-7.82-36	-1.67-35	-3.25-35	-5.93-35	-1.04-34	-1.75-34	-2.88-34	-4.61-34	-7.21-34
29	0.00+00	3.86-37	4.55-38	-9.54-37	-3.43-36	-8.66-36	-1.86-35	-3.64-35	-6.70-35	-1.18-34	-2.01-34	-3.34-34	-5.42-34	-8.60-34
28	0.00+00	4.31-37	5.88-38	-1.04-36	-3.79-36	-9.62-36	-2.08-35	-4.09-35	-7.59-35	-1.35-34	-2.33-34	-3.91-34	-6.44-34	-1.04-33
27	0.00+00	4.85-37	7.71-38	-1.14-36	-4.18-36	-1.07-35	-2.33-35	-4.61-35	-8.63-35	-1.55-34	-2.71-34	-4.62-34	-7.72-34	-1.27-33
26	0.00+00	5.49-37	1.03-37	-1.23-36	-4.62-36	-1.19-35	-2.61-35	-5.22-35	-9.86-35	-1.79-34	-3.17-34	-5.50-34	-9.37-34	-1.58-33
25	0.00+00	6.26-37	1.46-37	-1.31-36	-5.02-36	-1.31-35	-2.90-35	-5.85-35	-1.12-34	-2.06-34	-3.71-34	-6.56-34	-1.14-33	-1.97-33
24	0.00+00	7.18-37	1.98-37	-1.39-36	-5.49-36	-1.45-35	-3.24-35	-6.62-35	-1.28-34	-2.40-34	-4.40-34	-7.95-34	-1.42-33	-2.54-33
23	0.00+00	8.29-37	2.72-37	-1.45-36	-5.97-36	-1.60-35	-3.62-35	-7.48-35	-1.47-34	-2.81-34	-5.26-34	-9.77-34	-1.81-33	-3.36-33
22	0.00+00	9.66-37	3.76-37	-1.48-36	-6.42-36	-1.75-35	-4.02-35	-8.44-35	-1.69-34	-3.30-34	-6.34-34	-1.22-33	-2.34-33	-4.57-33
21	0.00+00	1.14-36	5.20-37	-1.45-36	-6.80-36	-1.90-35	-4.44-35	-9.49-35	-1.94-34	-3.88-34	-7.71-34	-1.54-33	-3.11-33	-6.49-33
20	0.00+00	1.35-36	7.22-37	-1.34-36	-7.06-36	-2.04-35	-4.85-35	-1.06-34	-2.22-34	-4.58-34	-9.46-34	-1.98-33	-4.29-33	-9.77-33
19	0.00+00	1.62-36	1.00-36	-1.11-36	-7.13-36	-2.14-35	-5.24-35	-1.17-34	-2.53-34	-5.43-34	-1.18-33	-2.63-33	-6.22-33	-1.61-32
18	0.00+00	1.96-36	1.38-36	-7.12-37	-6.94-36	-2.21-35	-5.58-35	-1.28-34	-2.88-34	-6.47-34	-1.50-33	-3.66-33	-9.79-33	-3.07-32
17	0.00+00	2.40-36	1.89-36	-1.08-37	-6.41-36	-2.23-35	-5.85-35	-1.40-34	-3.28-34	-7.84-34	-1.98-33	-5.47-33	-1.78-32	-7.87-32
16	0.00+00	2.97-36	2.58-36	7.62-37	-5.47-36	-2.18-35	-6.05-35	-1.51-34	-3.76-34	-9.80-34	-2.80-33	-9.38-33	-4.30-32	-4.29-31
15	0.00+00	3.72-36	3.50-36	1.99-36	-3.99-36	-2.06-35	-6.16-35	-1.64-34	-4.41-34	-1.30-33	-4.48-33	-2.12-32	-2.20-31	
14	0.00+00	4.73-36	4.79-36	3.79-36	-1.63-36	-1.80-35	-6.06-35	-1.75-34	-5.30-34	-1.88-33	-9.24-33	-9.91-32		
13	0.00+00	6.14-36	6.64-36	6.53-36	2.44-36	-1.20-35	-5.26-35	-1.73-34	-6.28-34	-3.18-33	-3.59-32			
12	0.00+00	8.14-36	9.42-36	1.10-35	1.01-35	2.19-36	-2.15-35	-9.40-35	-4.80-34	-6.14-33				
11	0.00+00	1.11-35	1.38-35	1.89-35	2.57-35	3.91-35	9.52-35	4.59-34	1.95-33					
10	0.00+00	1.57-35	2.11-35	3.36-35	6.08-35	1.47-34	6.24-34	6.69-33						
9	0.00+00	2.30-35	3.40-35	6.39-35	1.52-34	5.57-34	5.17-33							
8	0.00+00	3.58-35	5.89-35	1.36-34	4.55-34	3.46-33								
7	0.00+00	6.03-35	1.15-34	3.59-34	2.35-33									
6	0.00+00	1.17-34	2.86-34	1.71-33										
5	0.00+00	2.96-34	1.34-33											
4	0.00+00	1.42-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.06-34	-1.37-34	-1.72-34	-2.08-34	-2.46-34	-2.85-34	-3.24-34	-3.64-34	-4.05-34	-4.49-34	-4.84-34	-5.33-34	-5.87-34	-6.47-34
45	-1.61-34	-2.12-34	-2.70-34	-3.34-34	-4.03-34	-4.77-34	-5.56-34	-6.42-34	-7.37-34	-8.43-34	-9.44-34	-1.08-33	-1.25-33	-1.44-33
40	-2.66-34	-3.59-34	-4.69-34	-5.96-34	-7.42-34	-9.09-34	-1.10-33	-1.32-33	-1.59-33	-1.92-33	-2.28-33	-2.80-33	-3.47-33	-4.39-33
35	-4.93-34	-6.91-34	-9.41-34	-1.25-33	-1.64-33	-2.13-33	-2.75-33	-3.57-33	-4.67-33	-6.22-33	-8.31-33	-1.17-32	-1.71-32	-2.67-32
30	-1.10-33	-1.64-33	-2.41-33	-3.50-33	-5.05-33	-7.35-33	-1.09-32	-1.67-32	-2.69-32	-4.67-32	-8.90-32	-2.07-31	-6.73-31	-4.87-30
29	-1.34-33	-2.03-33	-3.05-33	-4.54-33	-6.77-33	-1.02-32	-1.59-32	-2.60-32	-4.55-32	-8.91-32	-2.05-31	-6.70-31	-4.87-30	
28	-1.64-33	-2.56-33	-3.94-33	-6.05-33	-9.38-33	-1.49-32	-2.47-32	-4.38-32	-8.65-32	-2.04-31	-6.62-31	-4.83-30		
27	-2.06-33	-3.29-33	-5.23-33	-8.35-33	-1.36-32	-2.30-32	-4.14-32	-8.28-32	-1.97-31	-6.53-31	-4.75-30			
26	-2.62-33	-4.33-33	-7.16-33	-1.20-32	-2.08-32	-3.82-32	-7.78-32	-1.88-31	-6.26-31	-4.55-30				
25	-3.39-33	-5.82-33	-1.01-32	-1.80-32	-3.40-32	-7.04-32	-1.73-31	-5.83-31	-4.33-30					
24	-4.54-33	-8.20-33	-1.52-32	-2.95-32	-6.27-32	-1.57-31	-5.39-31	-4.06-30						
23	-6.31-33	-1.21-32	-2.45-32	-5.37-32	-1.38-31	-4.85-31	-3.72-30							
22	-9.16-33	-1.92-32	-4.38-32	-1.16-31	-4.20-31	-3.29-30								
21	-1.42-32	-3.37-32	-9.30-32	-3.47-31	-2.80-30									
20	-2.42-32	-6.97-32	-2.70-31	-2.26-30										
19	-4.83-32	-1.96-31	-1.71-30											
18	-1.30-31	-1.19-30												
17	-7.52-31													

H TE = 1.50+04 NE = 1.00+08 CASE B NC = 20

TOTAL RC = 1.893-13 4-2 RC = 2.189-14 4-2 EM = 8.947-26 2S RC = 6.497-14 2P RC = 1.243-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.59-04	2.33-04	1.00-04	5.19-05	3.02-05	1.92-05	1.29-05	9.09-06	6.64-06	5.00-06	3.86-06	3.04-06	2.44-06	1.98-06
45	1.04-03	3.20-04	1.37-04	7.12-05	4.15-05	2.63-05	1.77-05	1.25-05	9.11-06	6.86-06	5.29-06	4.17-06	3.34-06	2.72-06
40	1.48-03	4.56-04	1.96-04	1.01-04	5.91-05	3.74-05	2.52-05	1.78-05	1.30-05	9.77-06	7.54-06	5.93-06	4.76-06	3.87-06
35	2.22-03	6.80-04	2.92-04	1.51-04	8.83-05	5.59-05	3.76-05	2.65-05	1.94-05	1.46-05	1.12-05	8.85-06	7.09-06	5.77-06
30	3.52-03	1.08-03	4.64-04	2.40-04	1.40-04	8.87-05	5.96-05	4.20-05	3.07-05	2.31-05	1.78-05	1.40-05	1.12-05	9.11-06
29	3.90-03	1.20-03	5.13-04	2.66-04	1.55-04	9.81-05	6.60-05	4.65-05	3.39-05	2.55-05	1.97-05	1.55-05	1.24-05	1.01-05
28	4.33-03	1.33-03	5.70-04	2.95-04	1.72-04	1.09-04	7.32-05	5.16-05	3.77-05	2.83-05	2.18-05	1.72-05	1.37-05	1.12-05
27	4.82-03	1.48-03	6.35-04	3.29-04	1.92-04	1.21-04	8.16-05	5.74-05	4.19-05	3.15-05	2.43-05	1.91-05	1.53-05	1.24-05
26	5.40-03	1.65-03	7.11-04	3.68-04	2.14-04	1.36-04	9.12-05	6.42-05	4.69-05	3.52-05	2.72-05	2.14-05	1.71-05	1.39-05
25	6.06-03	1.86-03	7.98-04	4.13-04	2.41-04	1.52-04	1.02-04	7.21-05	5.26-05	3.95-05	3.05-05	2.39-05	1.91-05	1.55-05
24	6.84-03	2.10-03	9.00-04	4.66-04	2.71-04	1.72-04	1.15-04	8.12-05	5.93-05	4.45-05	3.43-05	2.70-05	2.15-05	1.75-05
23	7.74-03	2.37-03	1.02-03	5.27-04	3.07-04	1.94-04	1.31-04	9.19-05	6.71-05	5.04-05	3.88-05	3.05-05	2.43-05	1.97-05
22	8.81-03	2.70-03	1.16-03	6.00-04	3.50-04	2.21-04	1.48-04	1.04-04	7.62-05	5.72-05	4.40-05	3.46-05	2.76-05	2.23-05
21	1.01-02	3.09-03	1.33-03	6.86-04	3.99-04	2.53-04	1.70-04	1.19-04	8.70-05	6.53-05	5.02-05	3.94-05	3.14-05	2.54-05
20	1.16-02	3.54-03	1.52-03	7.86-04	4.58-04	2.89-04	1.94-04	1.37-04	9.96-05	7.47-05	5.74-05	4.50-05	3.58-05	2.89-05
19	1.33-02	4.08-03	1.75-03	9.06-04	5.28-04	3.34-04	2.24-04	1.57-04	1.15-04	8.59-05	6.59-05	5.16-05	4.10-05	3.29-05
18	1.54-02	4.73-03	2.03-03	1.05-03	6.11-04	3.86-04	2.59-04	1.82-04	1.32-04	9.91-05	7.60-05	5.93-05	4.69-05	3.74-05
17	1.80-02	5.50-03	2.36-03	1.22-03	7.10-04	4.48-04	3.01-04	2.11-04	1.53-04	1.15-04	8.77-05	6.82-05	5.36-05	4.20-05
16	2.10-02	6.42-03	2.76-03	1.42-03	8.28-04	5.23-04	3.50-04	2.46-04	1.78-04	1.33-04	1.01-04	7.82-05	6.04-05	4.45-05
15	2.46-02	7.54-03	3.23-03	1.67-03	9.71-04	6.12-04	4.10-04	2.87-04	2.08-04	1.55-04	1.17-04	8.86-05	6.44-05	
14	2.90-02	8.89-03	3.81-03	1.97-03	1.14-03	7.21-04	4.82-04	3.37-04	2.43-04	1.79-04	1.33-04	9.52-05		
13	3.46-02	1.06-02	4.54-03	2.35-03	1.36-03	8.57-04	5.72-04	3.98-04	2.85-04	2.07-04	1.45-04			
12	4.20-02	1.29-02	5.51-03	2.86-03	1.65-03	1.04-03	6.89-04	4.76-04	3.35-04	2.29-04				
11	5.23-02	1.60-02	6.85-03	3.53-03	2.05-03	1.28-03	8.46-04	5.75-04	3.82-04					
10	6.79-02	2.05-02	8.78-03	4.52-03	2.61-03	1.63-03	1.06-03	6.77-04						
9	8.89-02	2.72-02	1.16-02	5.99-03	3.45-03	2.11-03	1.30-03							
8	1.23-01	3.75-02	1.61-02	8.29-03	4.68-03	2.72-03								
7	1.79-01	5.43-02	2.33-02	1.18-02	6.38-03									
6	2.82-01	8.41-02	3.58-02	1.74-02										
5	4.91-01	1.43-01	5.81-02											
4	1.00+00	2.71-01												
3	2.68+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.64-06	1.37-06	1.15-06	9.79-07	8.39-07	7.25-07	6.31-07	5.52-07	4.86-07	4.30-07	3.82-07	3.41-07	3.06-07	2.75-07
45	2.24-06	1.87-06	1.58-06	1.34-06	1.15-06	9.93-07	8.64-07	7.56-07	6.65-07	5.88-07	5.23-07	4.66-07	4.18-07	3.76-07
40	3.19-06	2.66-06	2.24-06	1.91-06	1.63-06	1.41-06	1.23-06	1.07-06	9.43-07	8.34-07	7.40-07	6.60-07	5.90-07	5.30-07
35	4.75-06	3.96-06	3.34-06	2.83-06	2.43-06	2.10-06	1.82-06	1.59-06	1.40-06	1.23-06	1.09-06	9.71-07	8.66-07	7.74-07
30	7.50-06	6.25-06	5.26-06	4.46-06	3.82-06	3.29-06	2.85-06	2.48-06	2.17-06	1.90-06	1.67-06	1.46-06	1.26-06	1.03-06
29	8.29-06	6.90-06	5.81-06	4.93-06	4.21-06	3.62-06	3.14-06	2.73-06	2.38-06	2.08-06	1.81-06	1.56-06	1.26-06	
28	9.19-06	7.65-06	6.43-06	5.45-06	4.66-06	4.00-06	3.46-06	3.00-06	2.61-06	2.26-06	1.93-06	1.56-06		
27	1.02-05	8.50-06	7.14-06	6.05-06	5.16-06	4.43-06	3.82-06	3.30-06	2.85-06	2.42-06	1.95-06			
26	1.14-05	9.48-06	7.96-06	6.74-06	5.74-06	4.91-06	4.22-06	3.62-06	3.07-06	2.46-06				
25	1.28-05	1.06-05	8.90-06	7.52-06	6.39-06	5.45-06	4.64-06	3.91-06	3.12-06					
24	1.43-05	1.19-05	9.97-06	8.40-06	7.11-06	6.02-06	5.04-06	4.00-06						
23	1.62-05	1.34-05	1.12-05	9.40-06	7.90-06	6.57-06	5.18-06							
22	1.83-05	1.51-05	1.26-05	1.05-05	8.65-06	6.77-06								
21	2.07-05	1.71-05	1.41-05	1.15-05	8.96-06									
20	2.35-05	1.92-05	1.56-05	1.20-05										
19	2.66-05	2.14-05	1.63-05											
18	2.97-05	2.24-05												
17	3.14-05													

H TE = 1.50+04 NE = 1.00+08 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.70+31	6.83-38	-1.44-38	-2.40-37	-7.35-37	-1.66-36	-3.25-36	-5.78-36	-9.52-36	-1.46-35	-2.08-35	-2.73-35	-3.35-35	-3.87-35
45	3.71-31	9.39-38	-2.03-38	-3.33-37	-1.02-36	-2.33-36	-4.58-36	-8.19-36	-1.36-35	-2.10-35	-3.02-35	-4.03-35	-5.00-35	-5.86-35
40	5.30-31	1.34-37	-2.99-38	-4.82-37	-1.49-36	-3.41-36	-6.76-36	-1.22-35	-2.05-35	-3.21-35	-4.68-35	-6.34-35	-8.03-35	-9.61-35
35	7.93-31	2.01-37	-4.67-38	-7.37-37	-2.29-36	-5.30-36	-1.06-35	-1.95-35	-3.33-35	-5.32-35	-7.92-35	-1.10-34	-1.43-34	-1.77-34
30	1.26-30	3.21-37	-7.74-38	-1.21-36	-3.80-36	-8.93-36	-1.83-35	-3.43-35	-6.01-35	-9.90-35	-1.53-34	-2.21-34	-3.01-34	-3.92-34
29	1.40-30	3.57-37	-8.63-38	-1.35-36	-4.26-36	-1.00-35	-2.06-35	-3.90-35	-6.88-35	-1.14-34	-1.78-34	-2.60-34	-3.59-34	-4.75-34
28	1.56-30	3.97-37	-9.62-38	-1.51-36	-4.78-36	-1.13-35	-2.34-35	-4.46-35	-7.93-35	-1.33-34	-2.09-34	-3.10-34	-4.35-34	-5.85-34
27	1.74-30	4.44-37	-1.07-37	-1.69-36	-5.40-36	-1.29-35	-2.68-35	-5.13-35	-9.22-35	-1.56-34	-2.49-34	-3.74-34	-5.33-34	-7.32-34
26	1.95-30	5.00-37	-1.20-37	-1.91-36	-6.13-36	-1.47-35	-3.08-35	-5.95-35	-1.08-34	-1.85-34	-3.00-34	-4.58-34	-6.66-34	-9.36-34
25	2.20-30	5.65-37	-1.34-37	-2.17-36	-6.98-36	-1.68-35	-3.56-35	-6.96-35	-1.28-34	-2.22-34	-3.66-34	-5.69-34	-8.47-34	-1.22-33
24	2.49-30	6.42-37	-1.48-37	-2.47-36	-8.00-36	-1.95-35	-4.16-35	-8.21-35	-1.53-34	-2.70-34	-4.53-34	-7.22-34	-1.10-33	-1.65-33
23	2.84-30	7.34-37	-1.62-37	-2.82-36	-9.22-36	-2.26-35	-4.89-35	-9.78-35	-1.85-34	-3.33-34	-5.72-34	-9.36-34	-1.48-33	-2.30-33
22	3.25-30	8.46-37	-1.75-37	-3.23-36	-1.07-35	-2.65-35	-5.79-35	-1.18-34	-2.27-34	-4.18-34	-7.37-34	-1.25-33	-2.05-33	-3.35-33
21	3.75-30	9.83-37	-1.83-37	-3.72-36	-1.24-35	-3.12-35	-6.93-35	-1.43-34	-2.83-34	-5.35-34	-9.74-34	-1.71-33	-2.97-33	-5.11-33
20	4.36-30	1.16-36	-1.72-37	-4.25-36	-1.45-35	-3.69-35	-8.33-35	-1.76-34	-3.56-34	-6.97-34	-1.32-33	-2.44-33	-4.51-33	-8.57-33
19	5.11-30	1.37-36	-1.45-37	-4.88-36	-1.70-35	-4.40-35	-1.01-34	-2.20-34	-4.60-34	-9.36-34	-1.87-33	-3.69-33	-7.42-33	-1.60-32
18	6.04-30	1.65-36	-7.66-38	-5.58-36	-1.99-35	-5.27-35	-1.25-34	-2.79-34	-6.06-34	-1.30-33	-2.77-33	-5.97-33	-1.36-32	-3.55-32
17	7.21-30	2.02-36	6.49-38	-6.30-36	-2.33-35	-6.33-35	-1.54-34	-3.59-34	-8.21-34	-1.88-33	-4.38-33	-1.07-32	-2.96-32	-1.09-31
16	8.70-30	2.50-36	3.31-37	-6.98-36	-2.70-35	-7.60-35	-1.92-34	-4.70-34	-1.15-33	-2.88-33	-7.60-33	-2.26-32	-8.82-32	-7.27-31
15	1.06-29	3.17-36	8.14-37	-7.47-36	-3.10-35	-9.09-35	-2.41-34	-6.29-34	-1.68-33	-4.78-33	-1.54-32	-6.47-32	-5.68-31	
14	1.32-29	4.10-36	1.66-36	-7.54-36	-3.49-35	-1.08-34	-3.05-34	-8.67-34	-2.63-33	-9.09-33	-4.15-32	-3.94-31		
13	1.67-29	5.42-36	2.99-36	-6.92-36	-3.82-35	-1.27-34	-3.92-34	-1.26-33	-4.62-33	-2.27-32	-2.35-31			
12	2.16-29	7.37-36	5.17-36	-5.28-36	-4.10-35	-1.52-34	-5.25-34	-2.03-33	-1.05-32	-1.17-31				
11	2.87-29	1.01-35	8.50-36	-2.15-36	-4.36-35	-1.88-34	-7.88-34	-4.25-33	-4.93-32					
10	3.92-29	1.45-35	1.41-35	3.84-36	-4.57-35	-2.55-34	-1.48-33	-1.78-32						
9	5.58-29	2.18-35	2.42-35	1.72-35	-4.11-35	-3.92-34	-4.99-33							
8	8.38-29	3.47-35	4.49-35	5.35-35	1.74-35	-5.04-34								
7	1.35-28	6.08-35	9.49-35	1.87-34	7.99-34									
6	2.43-28	1.20-34	2.54-34	1.19-33										
5	5.20-28	3.05-34	1.24-33											
4	1.55-27	1.44-33												
3	1.13-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-4.26-35	-4.52-35	-4.63-35	-4.62-35	-4.47-35	-4.05-35	-1.60-35	-2.97-35	-2.14-35	-1.06-35	3.17-36	2.13-35	4.43-35	7.36-35
45	-6.56-35	-7.08-35	-7.43-35	-7.59-35	-7.57-35	-7.18-35	-6.67-35	-5.93-35	-4.87-35	-3.30-35	-1.17-35	1.78-35	5.82-35	1.13-34
40	-1.10-34	-1.22-34	-1.32-34	-1.40-34	-1.46-34	-1.45-34	-1.45-34	-1.41-34	-1.31-34	-1.13-34	-8.27-35	-3.34-35	4.46-35	1.68-34
35	-2.10-34	-2.43-34	-2.76-34	-3.09-34	-3.44-34	-3.71-34	-4.09-34	-4.47-34	-4.86-34	-5.24-34	-5.51-34	-5.49-34	-4.78-34	-2.41-34
30	-4.96-34	-6.16-34	-7.59-34	-9.38-34	-1.17-33	-1.45-33	-1.89-33	-2.55-33	-3.61-33	-5.50-33	-9.29-33	-1.86-32	-5.08-32	-3.03-31
29	-6.12-34	-7.75-34	-9.80-34	-1.25-33	-1.61-33	-2.09-33	-2.87-33	-4.15-33	-6.46-33	-1.12-32	-2.33-32	-6.67-32	-4.20-31	
28	-7.68-34	-9.97-34	-1.30-33	-1.71-33	-2.30-33	-3.15-33	-4.63-33	-7.35-33	-1.30-32	-2.77-32	-8.19-32	-5.34-31		
27	-9.85-34	-1.31-33	-1.77-33	-2.42-33	-3.44-33	-5.05-33	-8.13-33	-1.46-32	-3.16-32	-9.53-32	-6.39-31			
26	-1.29-33	-1.78-33	-2.50-33	-3.61-33	-5.48-33	-8.78-33	-1.61-32	-3.51-32	-1.07-31	-7.28-31				
25	-1.75-33	-2.51-33	-3.70-33	-5.71-33	-9.47-33	-1.72-32	-3.82-32	-1.18-31	-8.12-31					
24	-2.45-33	-3.71-33	-5.83-33	-9.82-33	-1.84-32	-4.08-32	-1.28-31	-8.87-31						
23	-3.59-33	-5.80-33	-9.96-33	-1.90-32	-4.32-32	-1.35-31	-9.49-31							
22	-5.59-33	-9.85-33	-1.91-32	-4.42-32	-1.41-31	-9.93-31								
21	-9.42-33	-1.88-32	-4.42-32	-1.43-31	-1.02-30									
20	-1.76-32	-4.25-32	-1.40-31	-1.02-30										
19	-3.98-32	-1.35-31	-9.98-31											
18	-1.24-31	-9.45-31												
17	-8.55-31													

H TE = 1.50+04 NE = 1.00+09 CASE B NC = 20

TOTAL RC = 1.944-13 4-2 RC = 2.292-14 4-2 EM = 9.368-26 2S RC = 6.540-14 2P RC = 1.290-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.25-04	2.23-04	9.56-05	4.95-05	2.89-05	1.83-05	1.23-05	8.68-06	6.35-06	4.78-06	3.69-06	2.91-06	2.33-06	1.90-06
45	9.96-04	3.05-04	1.31-04	6.80-05	3.97-05	2.51-05	1.69-05	1.19-05	8.71-06	6.56-06	5.06-06	3.98-06	3.19-06	2.60-06
40	1.42-03	4.35-04	1.87-04	9.69-05	5.65-05	3.58-05	2.41-05	1.70-05	1.24-05	9.34-06	7.20-06	5.67-06	4.55-06	3.70-06
35	2.12-03	6.51-04	2.80-04	1.45-04	8.45-05	5.35-05	3.60-05	2.53-05	1.85-05	1.39-05	1.08-05	8.47-06	6.78-06	5.52-06
30	3.38-03	1.04-03	4.45-04	2.30-04	1.34-04	8.50-05	5.72-05	4.03-05	2.94-05	2.21-05	1.71-05	1.34-05	1.08-05	8.74-06
29	3.74-03	1.15-03	4.93-04	2.55-04	1.49-04	9.42-05	6.33-05	4.46-05	3.26-05	2.45-05	1.89-05	1.49-05	1.19-05	9.67-06
28	4.16-03	1.28-03	5.48-04	2.84-04	1.65-04	1.05-04	7.04-05	4.96-05	3.62-05	2.72-05	2.10-05	1.65-05	1.32-05	1.07-05
27	4.64-03	1.42-03	6.11-04	3.16-04	1.84-04	1.17-04	7.85-05	5.53-05	4.04-05	3.04-05	2.34-05	1.84-05	1.47-05	1.20-05
26	5.20-03	1.60-03	6.85-04	3.55-04	2.07-04	1.31-04	8.79-05	6.19-05	4.52-05	3.40-05	2.62-05	2.06-05	1.65-05	1.34-05
25	5.85-03	1.80-03	7.71-04	3.99-04	2.33-04	1.47-04	9.89-05	6.96-05	5.08-05	3.82-05	2.94-05	2.31-05	1.85-05	1.50-05
24	6.62-03	2.03-03	8.72-04	4.51-04	2.63-04	1.66-04	1.12-04	7.87-05	5.74-05	4.32-05	3.32-05	2.61-05	2.09-05	1.69-05
23	7.53-03	2.31-03	9.91-04	5.13-04	2.99-04	1.89-04	1.27-04	8.93-05	6.52-05	4.90-05	3.77-05	2.96-05	2.37-05	1.92-05
22	8.61-03	2.64-03	1.13-03	5.86-04	3.41-04	2.16-04	1.45-04	1.02-04	7.44-05	5.59-05	4.30-05	3.38-05	2.69-05	2.18-05
21	9.90-03	3.03-03	1.30-03	6.74-04	3.92-04	2.48-04	1.67-04	1.17-04	8.54-05	6.41-05	4.93-05	3.87-05	3.08-05	2.49-05
20	1.15-02	3.51-03	1.51-03	7.79-04	4.54-04	2.87-04	1.93-04	1.35-04	9.87-05	7.40-05	5.69-05	4.46-05	3.55-05	2.86-05
19	1.34-02	4.09-03	1.76-03	9.08-04	5.29-04	3.34-04	2.24-04	1.58-04	1.15-04	8.60-05	6.60-05	5.16-05	4.10-05	3.29-05
18	1.57-02	4.80-03	2.06-03	1.07-03	6.20-04	3.92-04	2.63-04	1.85-04	1.34-04	1.01-04	7.71-05	6.01-05	4.76-05	3.79-05
17	1.86-02	5.69-03	2.44-03	1.26-03	7.33-04	4.63-04	3.10-04	2.18-04	1.58-04	1.18-04	9.05-05	7.03-05	5.52-05	4.33-05
16	2.22-02	6.79-03	2.91-03	1.50-03	8.74-04	5.52-04	3.70-04	2.59-04	1.88-04	1.40-04	1.07-04	8.24-05	6.35-05	4.68-05
15	2.67-02	8.17-03	3.50-03	1.81-03	1.05-03	6.62-04	4.43-04	3.10-04	2.25-04	1.67-04	1.26-04	9.56-05	6.94-05	
14	3.24-02	9.91-03	4.24-03	2.19-03	1.27-03	8.01-04	5.35-04	3.74-04	2.69-04	1.99-04	1.48-04	1.05-04		
13	3.96-02	1.21-02	5.18-03	2.67-03	1.55-03	9.75-04	6.50-04	4.52-04	3.23-04	2.34-04	1.64-04			
12	4.87-02	1.49-02	6.37-03	3.28-03	1.90-03	1.19-03	7.91-04	5.46-04	3.84-04	2.62-04				
11	6.02-02	1.84-02	7.86-03	4.04-03	2.34-03	1.46-03	9.63-04	6.53-04	4.33-04					
10	7.52-02	2.30-02	9.80-03	5.03-03	2.90-03	1.80-03	1.16-03	7.44-04						
9	9.63-02	2.94-02	1.25-02	6.40-03	3.66-03	2.23-03	1.36-03							
8	1.29-01	3.93-02	1.67-02	8.47-03	4.77-03	2.74-03								
7	1.84-01	5.58-02	2.36-02	1.18-02	6.25-03									
6	2.84-01	8.52-02	3.54-02	1.67-02										
5	4.90-01	1.42-01	5.57-02											
4	1.00+00	2.59-01												
3	2.62+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.56-06	1.30-06	1.10-06	9.35-07	8.02-07	6.93-07	6.03-07	5.27-07	4.64-07	4.11-07	3.65-07	3.26-07	2.92-07	2.63-07
45	2.14-06	1.79-06	1.51-06	1.28-06	1.10-06	9.49-07	8.26-07	7.22-07	6.35-07	5.62-07	4.99-07	4.46-07	3.99-07	3.59-07
40	3.05-06	2.54-06	2.14-06	1.82-06	1.56-06	1.35-06	1.17-06	1.03-06	9.02-07	7.97-07	7.07-07	6.31-07	5.64-07	5.07-07
35	4.55-06	3.79-06	3.19-06	2.71-06	2.32-06	2.00-06	1.74-06	1.52-06	1.34-06	1.18-06	1.04-06	9.29-07	8.29-07	7.41-07
30	7.20-06	6.00-06	5.04-06	4.28-06	3.66-06	3.15-06	2.73-06	2.38-06	2.08-06	1.82-06	1.60-06	1.40-06	1.21-06	9.85-07
29	7.96-06	6.63-06	5.57-06	4.73-06	4.04-06	3.48-06	3.01-06	2.62-06	2.28-06	1.99-06	1.74-06	1.49-06	1.21-06	
28	8.83-06	7.35-06	6.18-06	5.24-06	4.48-06	3.85-06	3.32-06	2.88-06	2.51-06	2.17-06	1.86-06	1.50-06		
27	9.84-06	8.18-06	6.87-06	5.82-06	4.97-06	4.27-06	3.68-06	3.18-06	2.74-06	2.33-06	1.88-06			
26	1.10-05	9.14-06	7.67-06	6.49-06	5.53-06	4.74-06	4.07-06	3.49-06	2.96-06	2.37-06				
25	1.23-05	1.03-05	8.59-06	7.26-06	6.17-06	5.26-06	4.49-06	3.78-06	3.01-06					
24	1.39-05	1.15-05	9.66-06	8.14-06	6.89-06	5.83-06	4.88-06	3.87-06						
23	1.57-05	1.30-05	1.09-05	9.14-06	7.68-06	6.39-06	5.03-06							
22	1.79-05	1.48-05	1.23-05	1.02-05	8.45-06	6.61-06								
21	2.04-05	1.68-05	1.38-05	1.13-05	8.81-06									
20	2.33-05	1.90-05	1.54-05	1.19-05										
19	2.66-05	2.14-05	1.63-05											
18	3.01-05	2.27-05												
17	3.23-05													

H TE = 1.50+04 NE = 1.00+09 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.84-32	4.91-38	-4.74-38	-2.68-37	-7.12-37	-1.50-36	-2.71-36	-4.21-36	-5.53-36	-6.21-36	-6.07-36	-5.10-36	-3.38-36	-9.30-37
45	5.27-32	6.74-38	-6.58-38	-3.72-37	-9.92-37	-2.11-36	-3.83-36	-5.98-36	-7.93-36	-9.01-36	-8.94-36	-7.69-36	-5.33-36	-1.86-36
40	7.52-32	9.61-38	-9.54-38	-5.39-37	-1.45-36	-3.09-36	-5.67-36	-8.95-36	-1.20-35	-1.39-35	-1.41-35	-1.25-35	-9.17-36	-4.06-36
35	1.13-31	1.44-37	-1.46-37	-8.26-37	-2.23-36	-4.82-36	-8.96-36	-1.44-35	-1.97-35	-2.33-35	-2.43-35	-2.26-35	-1.79-35	-1.01-35
30	1.80-31	2.29-37	-2.41-37	-1.36-36	-3.73-36	-8.20-36	-1.55-35	-2.55-35	-3.61-35	-4.43-35	-4.86-35	-4.83-35	-4.27-35	-3.07-35
29	1.99-31	2.54-37	-2.69-37	-1.52-36	-4.19-36	-9.24-36	-1.76-35	-2.91-35	-4.15-35	-5.15-35	-5.72-35	-5.79-35	-5.25-35	-3.97-35
28	2.21-31	2.83-37	-3.02-37	-1.71-36	-4.72-36	-1.05-35	-2.01-35	-3.35-35	-4.81-35	-6.04-35	-6.81-35	-7.02-35	-6.56-35	-5.23-35
27	2.47-31	3.16-37	-3.41-37	-1.93-36	-5.35-36	-1.19-35	-2.31-35	-3.88-35	-5.63-35	-7.15-35	-8.20-35	-8.64-35	-8.32-35	-7.01-35
26	2.77-31	3.54-37	-3.87-37	-2.19-36	-6.11-36	-1.37-35	-2.67-35	-4.53-35	-6.65-35	-8.57-35	-1.00-34	-1.08-34	-1.08-34	-9.60-35
25	3.13-31	3.99-37	-4.41-37	-2.51-36	-7.01-36	-1.58-35	-3.11-35	-5.34-35	-7.94-35	-1.04-34	-1.24-34	-1.38-34	-1.43-34	-1.35-34
24	3.54-31	4.52-37	-5.06-37	-2.88-36	-8.11-36	-1.85-35	-3.66-35	-6.36-35	-9.61-35	-1.28-34	-1.57-34	-1.79-34	-1.94-34	-1.96-34
23	4.03-31	5.16-37	-5.84-37	-3.33-36	-9.45-36	-2.17-35	-4.36-35	-7.68-35	-1.18-34	-1.61-34	-2.02-34	-2.40-34	-2.72-34	-2.94-34
22	4.62-31	5.91-37	-6.79-37	-3.89-36	-1.11-35	-2.58-35	-5.25-35	-9.41-35	-1.48-34	-2.07-34	-2.68-34	-3.31-34	-3.97-34	-4.65-34
21	5.33-31	6.83-37	-7.95-37	-4.57-36	-1.32-35	-3.11-35	-6.42-35	-1.17-34	-1.88-34	-2.72-34	-3.66-34	-4.75-34	-6.08-34	-7.79-34
20	6.19-31	7.96-37	-9.36-37	-5.42-36	-1.58-35	-3.78-35	-7.95-35	-1.49-34	-2.46-34	-3.67-34	-5.17-34	-7.12-34	-9.86-34	-1.41-33
19	7.25-31	9.35-37	-1.11-36	-6.50-36	-1.92-35	-4.67-35	-1.01-34	-1.93-34	-3.30-34	-5.16-34	-7.68-34	-1.14-33	-1.75-33	-2.90-33
18	8.57-31	1.11-36	-1.33-36	-7.88-36	-2.37-35	-5.88-35	-1.30-34	-2.57-34	-4.59-34	-7.58-34	-1.21-33	-1.98-33	-3.49-33	-7.17-33
17	1.02-30	1.34-36	-1.61-36	-9.66-36	-2.96-35	-7.53-35	-1.72-34	-3.55-34	-6.68-34	-1.18-33	-2.08-33	-3.88-33	-8.40-33	-2.47-32
16	1.24-30	1.63-36	-1.94-36	-1.20-35	-3.76-35	-9.87-35	-2.34-34	-5.11-34	-1.03-33	-1.99-33	-4.00-33	-9.14-33	-2.82-32	-1.89-31
15	1.51-30	2.03-36	-2.35-36	-1.50-35	-4.86-35	-1.31-34	-3.32-34	-7.73-34	-1.71-33	-3.77-33	-9.24-33	-3.00-32	-2.10-31	
14	1.88-30	2.59-36	-2.81-36	-1.90-35	-6.39-35	-1.84-34	-4.91-34	-1.25-33	-3.16-33	-8.51-33	-2.96-32	-2.18-31		
13	2.38-30	3.41-36	-3.27-36	-2.41-35	-8.56-35	-2.62-34	-7.69-34	-2.24-33	-6.89-33	-2.64-32	-2.03-31			
12	3.07-30	4.65-36	-3.52-36	-3.05-35	-1.16-34	-3.90-34	-1.30-33	-4.65-33	-2.04-32	-1.77-31				
11	4.07-30	6.63-36	-3.13-36	-3.77-35	-1.59-34	-6.07-34	-2.48-33	-1.27-32	-1.27-31					
10	5.57-30	9.93-36	-1.42-36	-4.65-35	-2.19-34	-1.02-33	-5.99-33	-7.02-32						
9	7.92-30	1.56-35	3.67-36	-4.99-35	-3.16-34	-2.11-33	-2.81-32							
8	1.19-29	2.59-35	1.48-35	-5.43-35	-5.53-34	-8.40-33								
7	1.92-29	4.68-35	4.08-35	-5.52-35	-1.81-33									
6	3.45-29	9.78-35	1.29-34	2.42-35										
5	7.38-29	2.62-34	6.68-34											
4	2.21-28	1.26-33												
3	1.60-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.27-36	6.27-36	1.12-35	1.72-35	2.45-35	3.35-35	4.43-35	5.73-35	7.32-35	9.26-35	1.16-34	1.46-34	1.82-34	2.28-34
45	2.77-36	8.72-36	1.62-35	2.56-35	3.72-35	5.21-35	7.04-35	9.33-35	1.22-34	1.59-34	2.06-34	2.66-34	3.45-34	4.48-34
40	3.04-36	1.25-35	2.49-35	4.09-35	6.17-35	8.95-35	1.25-34	1.72-34	2.35-34	3.20-34	4.36-34	5.98-34	8.27-34	1.16-33
35	1.60-36	1.81-35	4.11-35	7.28-35	1.17-34	1.80-34	2.69-34	3.96-34	5.85-34	8.71-34	1.32-33	2.05-33	3.32-33	5.66-33
30	-1.01-35	2.27-35	7.39-35	1.54-34	2.80-34	4.91-34	8.44-34	1.46-33	2.64-33	5.09-33	1.09-32	2.77-32	9.80-32	7.66-31
29	-1.66-35	2.16-35	8.36-35	1.84-34	3.51-34	6.42-34	1.16-33	2.14-33	4.21-33	9.14-33	2.35-32	8.39-32	6.63-31	
28	-2.66-35	1.82-35	9.42-35	2.24-34	4.49-34	8.71-34	1.68-33	3.38-33	7.49-33	1.96-32	7.05-32	5.62-31		
27	-4.19-35	1.06-35	1.05-34	2.76-34	5.94-34	1.24-33	2.61-33	5.94-33	1.59-32	5.85-32	4.69-31			
26	-6.61-35	-4.92-36	1.14-34	3.46-34	8.18-34	1.88-33	4.52-33	1.24-32	4.69-32	3.87-31				
25	-1.06-34	-3.64-35	1.14-34	4.39-34	1.19-33	3.15-33	9.22-33	3.57-32	3.01-31					
24	-1.73-34	-9.96-35	8.93-35	5.66-34	1.87-33	6.17-33	2.58-32	2.25-31						
23	-2.93-34	-2.33-34	-8.22-36	7.20-34	3.33-33	1.63-32	1.57-31							
22	-5.25-34	-5.37-34	-3.46-34	7.57-34	7.37-33	8.73-32								
21	-1.01-33	-1.31-33	-1.58-33	-4.23-34	3.24-32									
20	-2.15-33	-3.66-33	-7.53-33	-2.31-32										
19	-5.56-33	-1.42-32	-7.44-32											
18	-2.00-32	-1.20-31												
17	-1.59-31													

H TE = 1.50+04 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 2.040-13 4-2 RC = 2.388-14 4-2 EM = 9.759-26 2S RC = 5.790-14 2P RC = 1.461-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.96-04	2.14-04	9.18-05	4.76-05	2.77-05	1.76-05	1.18-05	8.33-06	6.09-06	4.59-06	3.54-06	2.79-06	2.24-06	1.82-06
45	9.56-04	2.93-04	1.26-04	6.53-05	3.81-05	2.41-05	1.62-05	1.14-05	8.36-06	6.29-06	4.86-06	3.83-06	3.07-06	2.50-06
40	1.36-03	4.18-04	1.80-04	9.30-05	5.43-05	3.44-05	2.31-05	1.63-05	1.19-05	8.96-06	6.92-06	5.45-06	4.36-06	3.55-06
35	2.04-03	6.25-04	2.69-04	1.39-04	8.11-05	5.14-05	3.45-05	2.43-05	1.78-05	1.34-05	1.03-05	8.13-06	6.51-06	5.30-06
30	3.24-03	9.95-04	4.28-04	2.21-04	1.29-04	8.17-05	5.49-05	3.87-05	2.83-05	2.13-05	1.64-05	1.29-05	1.03-05	8.40-06
29	3.59-03	1.10-03	4.74-04	2.45-04	1.43-04	9.05-05	6.08-05	4.28-05	3.13-05	2.35-05	1.81-05	1.43-05	1.14-05	9.29-06
28	4.00-03	1.23-03	5.27-04	2.73-04	1.59-04	1.01-04	6.76-05	4.76-05	3.48-05	2.62-05	2.02-05	1.59-05	1.27-05	1.03-05
27	4.46-03	1.37-03	5.88-04	3.04-04	1.77-04	1.12-04	7.55-05	5.31-05	3.88-05	2.92-05	2.25-05	1.77-05	1.42-05	1.15-05
26	5.00-03	1.53-03	6.59-04	3.41-04	1.99-04	1.26-04	8.45-05	5.95-05	4.35-05	3.27-05	2.52-05	1.98-05	1.58-05	1.29-05
25	5.63-03	1.73-03	7.42-04	3.84-04	2.24-04	1.42-04	9.51-05	6.70-05	4.89-05	3.68-05	2.83-05	2.23-05	1.78-05	1.44-05
24	6.37-03	1.95-03	8.39-04	4.34-04	2.53-04	1.60-04	1.08-04	7.57-05	5.53-05	4.15-05	3.20-05	2.51-05	2.01-05	1.63-05
23	7.25-03	2.22-03	9.55-04	4.94-04	2.88-04	1.82-04	1.22-04	8.61-05	6.28-05	4.72-05	3.63-05	2.85-05	2.28-05	1.85-05
22	8.30-03	2.54-03	1.09-03	5.65-04	3.29-04	2.08-04	1.40-04	9.84-05	7.18-05	5.39-05	4.15-05	3.25-05	2.60-05	2.10-05
21	9.56-03	2.93-03	1.26-03	6.50-04	3.79-04	2.40-04	1.61-04	1.13-04	8.25-05	6.19-05	4.76-05	3.73-05	2.98-05	2.41-05
20	1.11-02	3.40-03	1.46-03	7.54-04	4.39-04	2.78-04	1.86-04	1.31-04	9.55-05	7.16-05	5.50-05	4.31-05	3.43-05	2.77-05
19	1.30-02	3.97-03	1.70-03	8.81-04	5.13-04	3.24-04	2.17-04	1.53-04	1.11-04	8.34-05	6.40-05	5.01-05	3.98-05	3.19-05
18	1.53-02	4.68-03	2.01-03	1.04-03	6.04-04	3.81-04	2.56-04	1.80-04	1.31-04	9.79-05	7.50-05	5.85-05	4.63-05	3.69-05
17	1.82-02	5.56-03	2.39-03	1.23-03	7.18-04	4.53-04	3.04-04	2.13-04	1.55-04	1.16-04	8.85-05	6.88-05	5.40-05	4.23-05
16	2.18-02	6.69-03	2.87-03	1.48-03	8.62-04	5.44-04	3.64-04	2.55-04	1.85-04	1.38-04	1.05-04	8.11-05	6.26-05	4.61-05
15	2.66-02	8.14-03	3.49-03	1.80-03	1.05-03	6.60-04	4.41-04	3.09-04	2.24-04	1.66-04	1.25-04	9.51-05	6.91-05	
14	3.28-02	1.00-02	4.29-03	2.22-03	1.29-03	8.10-04	5.41-04	3.78-04	2.72-04	2.01-04	1.49-04	1.06-04		
13	4.09-02	1.25-02	5.36-03	2.76-03	1.60-03	1.01-03	6.72-04	4.67-04	3.34-04	2.42-04	1.69-04			
12	5.20-02	1.59-02	6.79-03	3.50-03	2.03-03	1.27-03	8.43-04	5.82-04	4.09-04	2.79-04				
11	6.70-02	2.05-02	8.74-03	4.49-03	2.59-03	1.62-03	1.07-03	7.24-04	4.79-04					
10	8.76-02	2.67-02	1.14-02	5.84-03	3.36-03	2.08-03	1.35-03	8.61-04						
9	1.16-01	3.52-02	1.50-02	7.66-03	4.37-03	2.66-03	1.62-03							
8	1.54-01	4.67-02	1.98-02	1.00-02	5.64-03	3.23-03								
7	2.09-01	6.32-02	2.66-02	1.33-02	7.01-03									
6	3.05-01	9.15-02	3.79-02	1.78-02										
5	5.04-01	1.48-01	5.77-02											
4	1.00+00	2.70-01												
3	2.67+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.50-06	1.25-06	1.06-06	8.98-07	7.70-07	6.65-07	5.79-07	5.06-07	4.46-07	3.94-07	3.50-07	3.13-07	2.80-07	2.52-07
45	2.06-06	1.72-06	1.45-06	1.23-06	1.05-06	9.11-07	7.92-07	6.93-07	6.10-07	5.39-07	4.79-07	4.28-07	3.83-07	3.44-07
40	2.93-06	2.44-06	2.06-06	1.75-06	1.50-06	1.29-06	1.13-06	9.84-07	8.66-07	7.65-07	6.79-07	6.05-07	5.42-07	4.87-07
35	4.37-06	3.64-06	3.06-06	2.60-06	2.23-06	1.92-06	1.67-06	1.46-06	1.28-06	1.13-06	1.00-06	8.92-07	7.96-07	7.11-07
30	6.91-06	5.76-06	4.84-06	4.11-06	3.52-06	3.03-06	2.62-06	2.29-06	2.00-06	1.75-06	1.54-06	1.34-06	1.16-06	9.46-07
29	7.65-06	6.37-06	5.36-06	4.54-06	3.88-06	3.34-06	2.89-06	2.51-06	2.19-06	1.92-06	1.67-06	1.43-06	1.17-06	
28	8.49-06	7.07-06	5.94-06	5.04-06	4.30-06	3.70-06	3.19-06	2.77-06	2.41-06	2.09-06	1.79-06	1.44-06		
27	9.46-06	7.87-06	6.61-06	5.60-06	4.78-06	4.10-06	3.53-06	3.05-06	2.63-06	2.24-06	1.81-06			
26	1.06-05	8.79-06	7.38-06	6.24-06	5.32-06	4.55-06	3.91-06	3.35-06	2.84-06	2.28-06				
25	1.19-05	9.86-06	8.27-06	6.99-06	5.94-06	5.06-06	4.31-06	3.64-06	2.90-06					
24	1.34-05	1.11-05	9.30-06	7.84-06	6.63-06	5.61-06	4.70-06	3.73-06						
23	1.51-05	1.26-05	1.05-05	8.80-06	7.39-06	6.15-06	4.85-06							
22	1.72-05	1.42-05	1.18-05	9.87-06	8.15-06	6.38-06								
21	1.97-05	1.62-05	1.34-05	1.09-05	8.50-06									
20	2.25-05	1.84-05	1.49-05	1.15-05										
19	2.58-05	2.07-05	1.58-05											
18	2.93-05	2.21-05												
17	3.16-05													

H TE = 1.50+04 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.19-33	2.10-38	-6.01-38	-2.30-37	-5.29-37	-8.45-37	-8.61-37	-3.94-37	5.22-37	1.83-36	3.51-36	5.59-36	8.14-36	1.12-35
45	5.75-33	2.88-38	-8.34-38	-3.20-37	-7.39-37	-1.19-36	-1.23-36	-5.85-37	6.96-37	2.55-36	4.96-36	8.00-36	1.18-35	1.64-35
40	8.20-33	4.10-38	-1.21-37	-4.64-37	-1.08-36	-1.75-36	-1.83-36	-9.26-37	9.46-37	3.70-36	7.37-36	1.21-35	1.81-35	2.56-35
35	1.23-32	6.11-38	-1.84-37	-7.11-37	-1.67-36	-2.75-36	-2.95-36	-1.61-36	1.29-36	5.69-36	1.17-35	1.97-35	3.02-35	4.39-35
30	1.96-32	9.69-38	-3.02-37	-1.18-36	-2.80-36	-4.71-36	-5.25-36	-3.17-36	1.68-36	9.42-36	2.06-35	3.61-35	5.76-35	8.75-35
29	2.17-32	1.07-37	-3.38-37	-1.32-36	-3.15-36	-5.33-36	-5.98-36	-3.71-36	1.73-36	1.05-35	2.34-35	4.15-35	6.71-35	1.03-34
28	2.42-32	1.19-37	-3.79-37	-1.48-36	-3.56-36	-6.06-36	-6.87-36	-4.39-36	1.75-36	1.18-35	2.67-35	4.82-35	7.89-35	1.23-34
27	2.70-32	1.33-37	-4.27-37	-1.67-36	-4.04-36	-6.93-36	-7.95-36	-5.23-36	1.72-36	1.33-35	3.08-35	5.65-35	9.39-35	1.49-34
26	3.03-32	1.48-37	-4.84-37	-1.90-36	-4.62-36	-7.98-36	-9.23-36	-6.30-36	1.60-36	1.51-35	3.59-35	6.69-35	1.13-34	1.84-34
25	3.41-32	1.67-37	-5.52-37	-2.18-36	-5.32-36	-9.27-36	-1.09-35	-7.69-36	1.35-36	1.72-35	4.21-35	8.02-35	1.39-34	2.31-34
24	3.86-32	1.88-37	-6.33-37	-2.51-36	-6.17-36	-1.09-35	-1.30-35	-9.52-36	8.81-37	1.96-35	4.99-35	9.77-35	1.74-34	2.98-34
23	4.40-32	2.14-37	-7.32-37	-2.91-36	-7.22-36	-1.29-35	-1.57-35	-1.20-35	5.87-38	2.25-35	5.99-35	1.21-34	2.22-34	3.96-34
22	5.04-32	2.44-37	-8.53-37	-3.41-36	-8.53-36	-1.54-35	-1.92-35	-1.53-35	-1.34-36	2.58-35	7.29-35	1.53-34	2.93-34	5.47-34
21	5.81-32	2.80-37	-1.00-36	-4.03-36	-1.02-35	-1.87-35	-2.38-35	-2.00-35	-3.72-36	2.96-35	9.02-35	1.99-34	4.01-34	7.96-34
20	6.75-32	3.24-37	-1.19-36	-4.82-36	-1.23-35	-2.30-35	-3.02-35	-2.66-35	-7.75-36	3.38-35	1.14-34	3.26-34	7.68-34	1.25-33
19	7.91-32	3.77-37	-1.43-36	-5.83-36	-1.51-35	-2.88-35	-3.90-35	-3.66-35	-1.48-35	3.77-35	1.47-34	3.76-34	8.88-34	2.17-33
18	9.35-32	4.43-37	-1.73-36	-7.15-36	-1.89-35	-3.69-35	-5.18-35	-5.20-35	-2.76-35	3.97-35	1.95-34	5.61-34	1.51-33	4.48-33
17	1.12-31	5.26-37	-2.14-36	-8.92-36	-2.41-35	-4.84-35	-7.10-35	-7.70-35	-5.17-35	3.49-35	2.67-34	9.13-34	3.02-33	1.27-32
16	1.35-31	6.31-37	-2.67-36	-1.13-35	-3.14-35	-6.54-35	-1.01-34	-1.20-34	-1.00-34	8.67-36	3.78-34	1.71-33	8.17-33	7.76-32
15	1.65-31	7.68-37	-3.41-36	-1.48-35	-4.22-35	-9.17-35	-1.52-34	-1.99-34	-2.07-34	-9.00-35	5.36-34	4.13-33	4.67-32	
14	2.05-31	9.52-37	-4.44-36	-1.97-35	-5.85-35	-1.35-34	-2.41-34	-3.60-34	-4.74-34	-4.77-34	5.57-34	1.91-32		
13	2.59-31	1.21-36	-5.91-36	-2.71-35	-8.48-35	-2.10-34	-4.18-34	-7.37-34	-1.29-33	-2.49-33	-5.06-33			
12	3.35-31	1.58-36	-8.05-36	-3.87-35	-1.30-34	-3.54-34	-8.16-34	-1.81-33	-4.85-33	-2.52-32				
11	4.44-31	2.18-36	-1.12-35	-5.76-35	-2.12-34	-6.64-34	-1.90-33	-6.22-33	-3.99-32					
10	6.07-31	3.24-36	-1.58-35	-8.97-35	-3.78-34	-1.47-33	-6.11-33	-4.66-32						
9	8.64-31	5.39-36	-2.19-35	-1.46-34	-7.63-34	-4.30-33	-4.17-32							
8	1.30-30	1.03-35	-2.75-35	-2.47-34	-1.90-33	-2.52-32								
7	2.09-30	2.22-35	-2.51-35	-4.49-34	-8.35-33									
6	3.76-30	5.32-35	9.62-36	-1.26-33										
5	8.05-30	1.61-34	3.31-34											
4	2.41-29	9.14-34												
3	1.75-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.50-35	1.95-35	2.49-35	3.15-35	3.94-35	4.90-35	6.06-35	7.46-35	9.17-35	1.12-34	1.38-34	1.69-34	2.08-34	2.56-34
45	2.21-35	2.92-35	3.78-35	4.85-35	6.17-35	7.80-35	9.84-35	1.24-34	1.56-34	1.96-34	2.47-34	3.12-34	3.98-34	5.09-34
40	3.51-35	4.72-35	6.24-35	8.19-35	1.07-34	1.39-34	1.81-34	2.35-34	3.07-34	4.04-34	5.35-34	7.16-34	9.73-34	1.34-33
35	6.19-35	8.57-35	1.17-34	1.60-34	2.17-34	2.97-34	4.08-34	5.66-34	7.96-34	1.14-33	1.68-33	2.55-33	4.03-33	6.75-33
30	1.30-34	1.89-34	2.76-34	4.05-34	6.01-34	9.09-34	1.41-33	2.29-33	3.90-33	7.18-33	1.48-32	3.66-32	1.27-31	9.65-31
29	1.55-34	2.31-34	3.43-34	5.15-34	7.85-34	1.23-33	2.00-33	3.44-33	6.37-33	1.32-32	3.28-32	1.13-31	8.75-31	
28	1.88-34	2.86-34	4.35-34	6.71-34	1.06-33	1.74-33	3.01-33	5.60-33	1.17-32	2.90-32	1.01-31	7.74-31		
27	2.33-34	3.61-34	5.66-34	9.06-34	1.50-33	2.61-33	4.89-33	1.02-32	2.56-32	8.94-32	6.92-31			
26	2.94-34	4.69-34	7.62-34	1.28-33	2.24-33	4.23-33	8.91-33	2.24-32	7.86-32	6.11-31				
25	3.80-34	6.29-34	1.07-33	1.90-33	3.61-33	7.68-33	1.95-32	6.36-32	5.35-31					
24	5.07-34	8.80-34	1.59-33	3.06-33	6.54-33	1.67-32	5.92-32	4.65-31						
23	7.06-34	1.30-33	2.54-33	5.51-33	1.42-32	5.06-32	3.99-31							
22	1.04-33	2.07-33	4.56-33	1.19-32	4.28-32	3.40-31								
21	1.64-33	3.69-33	9.77-33	3.57-32	2.87-31									
20	2.90-33	7.85-33	2.91-32	2.37-31										
19	6.09-33	2.31-32	1.91-31											
18	1.76-32	1.50-31												
17	1.12-31													

H TE = 2.00+04 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 1.428-13 4-2 RC = 1.610-14 4-2 EM = 6.580-26 2S RC = 5.059-14 2P RC = 9.220-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.94-04	1.53-04	6.71-05	3.55-05	2.11-05	1.35-05	9.23-06	6.58-06	4.86-06	3.69-06	2.87-06	2.27-06	1.83-06	1.50-06
45	6.56-04	2.03-04	8.98-05	4.78-05	2.86-05	1.85-05	1.26-05	9.04-06	6.69-06	5.10-06	3.97-06	3.15-06	2.54-06	2.08-06
40	9.05-04	2.80-04	1.25-04	6.71-05	4.04-05	2.63-05	1.81-05	1.30-05	9.61-06	7.33-06	5.72-06	4.55-06	3.67-06	3.01-06
35	1.31-03	4.07-04	1.84-04	9.96-05	6.03-05	3.94-05	2.72-05	1.95-05	1.45-05	1.11-05	8.64-06	6.87-06	5.55-06	4.54-06
30	2.02-03	6.35-04	2.90-04	1.58-04	9.63-05	6.30-05	4.35-05	3.13-05	2.32-05	1.77-05	1.38-05	1.10-05	8.88-06	7.26-06
29	2.22-03	7.01-04	3.21-04	1.75-04	1.07-04	6.98-05	4.82-05	3.47-05	2.58-05	1.97-05	1.53-05	1.22-05	9.83-06	8.05-06
28	2.46-03	7.78-04	3.56-04	1.95-04	1.19-04	7.76-05	5.36-05	3.86-05	2.87-05	2.19-05	1.71-05	1.35-05	1.09-05	8.94-06
27	2.73-03	8.66-04	3.97-04	2.17-04	1.32-04	8.67-05	5.99-05	4.31-05	3.20-05	2.44-05	1.90-05	1.51-05	1.22-05	9.97-06
26	3.05-03	9.69-04	4.45-04	2.44-04	1.48-04	9.72-05	6.71-05	4.83-05	3.59-05	2.73-05	2.13-05	1.69-05	1.37-05	1.12-05
25	3.42-03	1.09-03	5.01-04	2.74-04	1.67-04	1.09-04	7.55-05	5.43-05	4.04-05	3.08-05	2.40-05	1.90-05	1.54-05	1.25-05
24	3.85-03	1.23-03	5.66-04	3.10-04	1.89-04	1.24-04	8.54-05	6.14-05	4.56-05	3.48-05	2.71-05	2.15-05	1.73-05	1.42-05
23	4.37-03	1.40-03	6.43-04	3.52-04	2.15-04	1.41-04	9.71-05	6.98-05	5.19-05	3.95-05	3.08-05	2.44-05	1.97-05	1.61-05
22	4.99-03	1.60-03	7.35-04	4.03-04	2.45-04	1.61-04	1.11-04	7.98-05	5.93-05	4.52-05	3.52-05	2.79-05	2.24-05	1.83-05
21	5.73-03	1.83-03	8.45-04	4.63-04	2.82-04	1.85-04	1.28-04	9.18-05	6.82-05	5.19-05	4.04-05	3.20-05	2.57-05	2.09-05
20	6.63-03	2.12-03	9.78-04	5.36-04	3.27-04	2.14-04	1.48-04	1.06-04	7.89-05	6.01-05	4.67-05	3.70-05	2.97-05	2.41-05
19	7.74-03	2.48-03	1.14-03	6.26-04	3.81-04	2.50-04	1.72-04	1.24-04	9.20-05	7.00-05	5.44-05	4.30-05	3.44-05	2.78-05
18	9.10-03	2.91-03	1.34-03	7.36-04	4.49-04	2.94-04	2.03-04	1.46-04	1.08-04	8.22-05	6.38-05	5.03-05	4.01-05	3.21-05
17	1.08-02	3.46-03	1.59-03	8.74-04	5.33-04	3.49-04	2.41-04	1.73-04	1.28-04	9.74-05	7.54-05	5.92-05	4.67-05	3.67-05
16	1.30-02	4.15-03	1.91-03	1.05-03	6.40-04	4.19-04	2.89-04	2.07-04	1.54-04	1.16-04	8.97-05	6.98-05	5.41-05	3.98-05
15	1.58-02	5.04-03	2.32-03	1.27-03	7.77-04	5.09-04	3.51-04	2.52-04	1.86-04	1.40-04	1.07-04	8.19-05	5.94-05	
14	1.94-02	6.20-03	2.86-03	1.57-03	9.56-04	6.26-04	4.31-04	3.09-04	2.27-04	1.70-04	1.28-04	9.12-05		
13	2.43-02	7.75-03	3.57-03	1.96-03	1.20-03	7.82-04	5.38-04	3.84-04	2.80-04	2.06-04	1.45-04			
12	3.10-02	9.87-03	4.55-03	2.50-03	1.52-03	9.94-04	6.82-04	4.83-04	3.47-04	2.39-04				
11	4.04-02	1.28-02	5.92-03	3.25-03	1.98-03	1.29-03	8.79-04	6.12-04	4.12-04					
10	5.40-02	1.72-02	7.90-03	4.33-03	2.63-03	1.71-03	1.15-03	7.49-04						
9	7.46-02	2.36-02	1.09-02	5.96-03	3.61-03	2.30-03	1.45-03							
8	1.07-01	3.39-02	1.56-02	8.50-03	5.08-03	3.06-03								
7	1.63-01	5.11-02	2.34-02	1.26-02	7.13-03									
6	2.64-01	8.23-02	3.73-02	1.91-02										
5	4.75-01	1.45-01	6.26-02											
4	1.00+00	2.84-01												
3	2.75+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.24-06	1.04-06	8.81-07	7.52-07	6.46-07	5.60-07	4.88-07	4.28-07	3.78-07	3.35-07	2.98-07	2.66-07	2.39-07	2.15-07
45	1.73-06	1.45-06	1.23-06	1.05-06	9.00-07	7.80-07	6.80-07	5.97-07	5.26-07	4.66-07	4.15-07	3.71-07	3.32-07	2.99-07
40	2.49-06	2.09-06	1.77-06	1.51-06	1.30-06	1.13-06	9.81-07	8.60-07	7.58-07	6.70-07	5.96-07	5.32-07	4.76-07	4.28-07
35	3.77-06	3.16-06	2.67-06	2.28-06	1.96-06	1.69-06	1.47-06	1.29-06	1.13-06	1.00-06	8.87-07	7.89-07	7.03-07	6.28-07
30	6.02-06	5.03-06	4.25-06	3.62-06	3.10-06	2.68-06	2.32-06	2.02-06	1.77-06	1.55-06	1.36-06	1.18-06	1.02-06	8.23-07
29	6.66-06	5.57-06	4.70-06	4.00-06	3.43-06	2.96-06	2.56-06	2.23-06	1.94-06	1.69-06	1.47-06	1.26-06	1.01-06	
28	7.40-06	6.19-06	5.22-06	4.44-06	3.80-06	3.27-06	2.83-06	2.45-06	2.13-06	1.84-06	1.57-06	1.26-06		
27	8.25-06	6.89-06	5.81-06	4.94-06	4.22-06	3.62-06	3.12-06	2.70-06	2.32-06	1.97-06	1.57-06			
26	9.23-06	7.71-06	6.49-06	5.51-06	4.70-06	4.02-06	3.45-06	2.95-06	2.49-06	1.98-06				
25	1.04-05	8.65-06	7.27-06	6.16-06	5.24-06	4.47-06	3.80-06	3.19-06	2.52-06					
24	1.17-05	9.74-06	8.18-06	6.90-06	5.84-06	4.94-06	4.12-06	3.24-06						
23	1.32-05	1.10-05	9.22-06	7.74-06	6.50-06	5.39-06	4.21-06							
22	1.51-05	1.25-05	1.04-05	8.67-06	7.13-06	5.54-06								
21	1.72-05	1.42-05	1.17-05	9.57-06	7.38-06									
20	1.97-05	1.61-05	1.30-05	9.98-06										
19	2.25-05	1.81-05	1.37-05											
18	2.55-05	1.91-05												
17	2.73-05													

H TE = 2.00+04 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	6.68-38	7.78-38	1.04-37	1.45-37	2.16-37	3.41-37	5.58-37	9.23-37	1.51-36	2.43-36	3.81-36	5.83-36	8.74-36
45	0.00+00	9.18-38	1.10-37	1.53-37	2.24-37	3.40-37	5.32-37	8.44-37	1.34-36	2.11-36	3.27-36	4.98-36	7.44-36	1.09-35
40	0.00+00	1.30-37	1.58-37	2.27-37	3.39-37	5.17-37	7.95-37	1.22-36	1.86-36	2.82-36	4.20-36	6.18-36	8.99-36	1.29-35
35	0.00+00	1.91-37	2.33-37	3.38-37	5.08-37	7.65-37	1.14-36	1.69-36	2.48-36	3.59-36	5.13-36	7.28-36	1.02-35	1.43-35
30	0.00+00	2.98-37	3.63-37	5.25-37	7.80-37	1.15-36	1.68-36	2.40-36	3.38-36	4.70-36	6.43-36	8.71-36	1.17-35	1.55-35
29	0.00+00	3.30-37	4.00-37	5.79-37	8.59-37	1.27-36	1.84-36	2.61-36	3.66-36	5.05-36	6.86-36	9.19-36	1.21-35	1.58-35
28	0.00+00	3.66-37	4.43-37	6.41-37	9.51-37	1.40-36	2.02-36	2.87-36	4.00-36	5.48-36	7.39-36	9.79-36	1.27-35	1.62-35
27	0.00+00	4.08-37	4.94-37	7.14-37	1.06-36	1.56-36	2.25-36	3.18-36	4.42-36	6.02-36	8.05-36	1.05-35	1.35-35	1.66-35
26	0.00+00	4.56-37	5.53-37	7.99-37	1.19-36	1.74-36	2.52-36	3.56-36	4.94-36	6.70-36	8.90-36	1.15-35	1.44-35	1.70-35
25	0.00+00	5.13-37	6.22-37	9.00-37	1.34-36	1.97-36	2.85-36	4.03-36	5.59-36	7.58-36	1.00-35	1.28-35	1.55-35	1.72-35
24	0.00+00	5.81-37	7.05-37	1.02-36	1.52-36	2.25-36	3.26-36	4.63-36	6.43-36	8.71-36	1.15-35	1.44-35	1.69-35	1.68-35
23	0.00+00	6.62-37	8.03-37	1.17-36	1.75-36	2.59-36	3.78-36	5.39-36	7.52-36	1.02-35	1.34-35	1.66-35	1.84-35	1.50-35
22	0.00+00	7.58-37	9.23-37	1.35-36	2.03-36	3.02-36	4.44-36	6.37-36	8.94-36	1.22-35	1.59-35	1.93-35	1.97-35	9.26-36
21	0.00+00	8.75-37	1.07-36	1.57-36	2.37-36	3.57-36	5.28-36	7.66-36	1.08-35	1.49-35	1.94-35	2.28-35	1.98-35	-6.75-36
20	0.00+00	1.02-36	1.25-36	1.84-36	2.81-36	4.27-36	6.39-36	9.38-36	1.34-35	1.86-35	2.41-35	2.69-35	1.53-35	-5.25-35
19	0.00+00	1.19-36	1.47-36	2.19-36	3.37-36	5.19-36	7.87-36	1.17-35	1.71-35	2.39-35	3.06-35	3.04-35	-5.03-36	-1.97-34
18	0.00+00	1.42-36	1.75-36	2.63-36	4.10-36	6.41-36	9.90-36	1.50-35	2.23-35	3.15-35	3.94-35	2.86-35	-8.39-35	-7.58-34
17	0.00+00	1.70-36	2.11-36	3.21-36	5.08-36	8.08-36	1.28-35	1.99-35	3.01-35	4.30-35	4.97-35	-1.25-36	-4.30-34	-3.95-33
16	0.00+00	2.06-36	2.59-36	3.98-36	6.41-36	1.04-35	1.69-35	2.72-35	4.24-35	6.04-35	5.38-35	-1.82-34	-2.59-33	-4.88-32
15	0.00+00	2.53-36	3.21-36	5.03-36	8.29-36	1.39-35	2.33-35	3.90-35	6.28-35	8.54-35	-8.35-36	-1.51-33	-3.53-32	
14	0.00+00	3.16-36	4.07-36	6.50-36	1.10-35	1.92-35	3.37-35	5.92-35	9.83-35	1.02-34	-7.07-34	-2.40-32		
13	0.00+00	4.03-36	5.28-36	8.65-36	1.52-35	2.78-35	5.20-35	9.76-35	1.60-34	-1.52-34	-1.49-32			
12	0.00+00	5.26-36	7.04-36	1.19-35	2.21-35	4.32-35	8.80-35	1.79-34	1.92-34	-8.06-33				
11	0.00+00	7.07-36	9.73-36	1.73-35	3.43-35	7.38-35	1.71-34	3.66-34	-3.24-33					
10	0.00+00	9.85-36	1.41-35	2.67-35	5.87-35	1.47-34	4.14-34	-2.29-34						
9	0.00+00	1.44-35	2.17-35	4.55-35	1.18-34	3.83-34	1.32-33							
8	0.00+00	2.24-35	3.68-35	9.03-35	3.14-34	1.81-33								
7	0.00+00	3.83-35	7.23-35	2.39-34	1.67-33									
6	0.00+00	7.58-35	1.86-34	1.28-33										
5	0.00+00	1.96-34	9.36-34											
4	0.00+00	9.57-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.28-35	1.85-35	2.62-35	3.67-35	5.07-35	6.94-35	9.42-35	1.27-34	1.70-34	2.26-34	3.00-34	3.98-34	5.26-34	6.94-34
45	1.58-35	2.25-35	3.18-35	4.43-35	6.12-35	8.39-35	1.14-34	1.55-34	2.10-34	2.84-34	3.83-34	5.18-34	7.01-34	9.53-34
40	1.84-35	2.59-35	3.61-35	5.02-35	6.94-35	9.56-35	1.32-34	1.81-34	2.49-34	3.44-34	4.76-34	6.65-34	9.38-34	1.34-33
35	1.98-35	2.74-35	3.78-35	5.21-35	7.18-35	9.90-35	1.37-34	1.91-34	2.67-34	3.79-34	5.43-34	7.91-34	1.18-33	1.82-33
30	2.03-35	2.63-35	3.35-35	4.16-35	4.97-35	5.47-35	4.84-35	9.04-36	-1.23-34	-5.26-34	-1.81-33	-6.59-33	-3.11-32	-3.10-31
29	2.02-35	2.52-35	3.03-35	3.39-35	3.23-35	1.63-35	-3.76-35	-1.92-34	-6.33-34	-1.98-33	-6.89-33	-3.18-32	-3.17-31	
28	1.99-35	2.34-35	2.48-35	2.04-35	6.86-37	-5.77-35	-2.17-34	-6.56-34	-1.98-33	-6.77-33	-3.11-32	-3.11-31		
27	1.93-35	2.00-35	1.51-35	-4.27-36	-6.01-35	-2.10-34	-6.24-34	-1.87-33	-6.37-33	-2.93-32	-2.97-31			
26	1.79-35	1.40-35	-2.56-36	-5.15-35	-1.85-34	-5.56-34	-1.68-33	-5.79-33	-2.69-32	-2.77-31				
25	1.51-35	2.62-36	-3.70-35	-1.49-34	-4.67-34	-1.45-33	-5.09-33	-2.41-32	-2.53-31					
24	8.97-36	-2.04-35	-1.09-34	-3.71-34	-1.21-33	-4.35-33	-2.11-32	-2.27-31						
23	-4.44-36	-7.03-35	-2.77-34	-9.59-34	-3.61-33	-1.81-32	-2.00-31							
22	-3.55-35	-1.90-34	-7.28-34	-2.90-33	-1.52-32	-1.74-31								
21	-1.14-34	-5.21-34	-2.25-33	-1.24-32	-1.49-31									
20	-3.43-34	-1.67-33	-9.87-33	-1.25-31										
19	-1.17-33	-7.60-33	-1.03-31											
18	-5.63-33	-8.26-32												
17	-6.46-32													

H TE = 2.00+04 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 1.428-13 4-2 RC = 1.611-14 4-2 EM = 6.583-26 2S RC = 5.061-14 2P RC = 9.222-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.42-04	1.67-04	7.20-05	3.75-05	2.19-05	1.39-05	9.41-06	6.65-06	4.88-06	3.68-06	2.84-06	2.24-06	1.80-06	1.47-06
45	7.23-04	2.23-04	9.65-05	5.04-05	2.96-05	1.88-05	1.27-05	9.02-06	6.62-06	5.00-06	3.87-06	3.06-06	2.46-06	2.01-06
40	9.93-04	3.07-04	1.34-04	7.01-05	4.14-05	2.65-05	1.80-05	1.28-05	9.39-06	7.11-06	5.52-06	4.36-06	3.51-06	2.87-06
35	1.42-03	4.40-04	1.93-04	1.02-04	6.08-05	3.91-05	2.67-05	1.90-05	1.41-05	1.07-05	8.30-06	6.58-06	5.30-06	4.34-06
30	2.16-03	6.68-04	2.97-04	1.59-04	9.54-05	6.19-05	4.25-05	3.04-05	2.25-05	1.72-05	1.34-05	1.06-05	8.56-06	7.00-06
29	2.37-03	7.33-04	3.27-04	1.76-04	1.06-04	6.86-05	4.71-05	3.38-05	2.50-05	1.91-05	1.49-05	1.18-05	9.51-06	7.78-06
28	2.62-03	8.08-04	3.61-04	1.95-04	1.17-04	7.63-05	5.24-05	3.76-05	2.79-05	2.13-05	1.66-05	1.31-05	1.06-05	8.67-06
27	2.89-03	8.95-04	4.01-04	2.17-04	1.31-04	8.52-05	5.86-05	4.21-05	3.12-05	2.38-05	1.85-05	1.47-05	1.19-05	9.69-06
26	3.21-03	9.95-04	4.48-04	2.42-04	1.47-04	9.56-05	6.58-05	4.72-05	3.51-05	2.67-05	2.08-05	1.65-05	1.33-05	1.09-05
25	3.58-03	1.11-03	5.02-04	2.73-04	1.65-04	1.08-04	7.42-05	5.33-05	3.95-05	3.01-05	2.35-05	1.86-05	1.50-05	1.23-05
24	4.01-03	1.25-03	5.67-04	3.08-04	1.87-04	1.22-04	8.41-05	6.04-05	4.48-05	3.41-05	2.66-05	2.11-05	1.70-05	1.39-05
23	4.52-03	1.41-03	6.43-04	3.50-04	2.13-04	1.39-04	9.58-05	6.88-05	5.10-05	3.89-05	3.03-05	2.40-05	1.93-05	1.57-05
22	5.13-03	1.61-03	7.34-04	4.00-04	2.43-04	1.59-04	1.10-04	7.88-05	5.84-05	4.45-05	3.46-05	2.74-05	2.20-05	1.79-05
21	5.86-03	1.85-03	8.44-04	4.61-04	2.80-04	1.83-04	1.26-04	9.08-05	6.73-05	5.12-05	3.98-05	3.15-05	2.53-05	2.06-05
20	6.74-03	2.13-03	9.77-04	5.34-04	3.25-04	2.12-04	1.47-04	1.05-04	7.80-05	5.93-05	4.61-05	3.64-05	2.92-05	2.37-05
19	7.83-03	2.48-03	1.14-03	6.23-04	3.79-04	2.48-04	1.71-04	1.23-04	9.10-05	6.92-05	5.37-05	4.24-05	3.38-05	2.73-05
18	9.18-03	2.92-03	1.34-03	7.34-04	4.47-04	2.92-04	2.01-04	1.45-04	1.07-04	8.13-05	6.30-05	4.95-05	3.94-05	3.15-05
17	1.09-02	3.46-03	1.59-03	8.72-04	5.31-04	3.47-04	2.39-04	1.72-04	1.27-04	9.63-05	7.44-05	5.83-05	4.60-05	3.61-05
16	1.30-02	4.15-03	1.91-03	1.05-03	6.37-04	4.17-04	2.87-04	2.06-04	1.52-04	1.15-04	8.84-05	6.87-05	5.32-05	3.91-05
15	1.58-02	5.04-03	2.32-03	1.27-03	7.74-04	5.06-04	3.49-04	2.49-04	1.84-04	1.38-04	1.06-04	8.05-05	5.84-05	
14	1.94-02	6.20-03	2.86-03	1.57-03	9.53-04	6.23-04	4.28-04	3.06-04	2.25-04	1.68-04	1.26-04	8.98-05		
13	2.43-02	7.75-03	3.57-03	1.96-03	1.19-03	7.78-04	5.34-04	3.80-04	2.77-04	2.03-04	1.43-04			
12	3.10-02	9.87-03	4.55-03	2.49-03	1.52-03	9.89-04	6.77-04	4.78-04	3.42-04	2.35-04				
11	4.04-02	1.28-02	5.91-03	3.24-03	1.97-03	1.28-03	8.71-04	6.05-04	4.05-04					
10	5.40-02	1.71-02	7.89-03	4.32-03	2.62-03	1.70-03	1.13-03	7.38-04						
9	7.46-02	2.36-02	1.09-02	5.94-03	3.59-03	2.28-03	1.43-03							
8	1.07-01	3.39-02	1.56-02	8.47-03	5.04-03	3.02-03								
7	1.63-01	5.10-02	2.34-02	1.26-02	7.06-03									
6	2.64-01	8.22-02	3.72-02	1.90-02										
5	4.76-01	1.45-01	6.22-02											
4	1.00+00	2.83-01												
3	2.74+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.21-06	1.01-06	8.55-07	7.28-07	6.25-07	5.41-07	4.71-07	4.12-07	3.63-07	3.21-07	2.86-07	2.55-07	2.29-07	2.06-07
45	1.66-06	1.39-06	1.17-06	9.96-07	8.56-07	7.40-07	6.45-07	5.65-07	4.97-07	4.40-07	3.92-07	3.50-07	3.13-07	2.82-07
40	2.37-06	1.98-06	1.68-06	1.43-06	1.23-06	1.06-06	9.25-07	8.11-07	7.14-07	6.32-07	5.62-07	5.01-07	4.49-07	4.04-07
35	3.59-06	3.00-06	2.54-06	2.17-06	1.86-06	1.61-06	1.40-06	1.23-06	1.08-06	9.54-07	8.46-07	7.54-07	6.73-07	6.02-07
30	5.80-06	4.85-06	4.10-06	3.49-06	2.99-06	2.59-06	2.24-06	1.96-06	1.71-06	1.50-06	1.32-06	1.15-06	9.93-07	8.07-07
29	6.44-06	5.39-06	4.55-06	3.87-06	3.32-06	2.86-06	2.48-06	2.16-06	1.88-06	1.65-06	1.43-06	1.23-06	9.95-07	
28	7.17-06	6.00-06	5.06-06	4.31-06	3.59-06	3.17-06	2.75-06	2.38-06	2.07-06	1.79-06	1.53-06	1.24-06		
27	8.02-06	6.70-06	5.65-06	4.80-06	4.10-06	3.53-06	3.04-06	2.63-06	2.27-06	1.93-06	1.55-06			
26	8.99-06	7.51-06	6.32-06	5.37-06	4.58-06	3.92-06	3.37-06	2.89-06	2.44-06	1.95-06				
25	1.01-05	8.44-06	7.10-06	6.01-06	5.12-06	4.36-06	3.72-06	3.13-06	2.48-06					
24	1.14-05	9.52-06	7.99-06	6.75-06	5.72-06	4.84-06	4.04-06	3.19-06						
23	1.30-05	1.08-05	9.02-06	7.58-06	6.37-06	5.29-06	4.15-06							
22	1.48-05	1.22-05	1.02-05	8.49-06	7.00-06	5.46-06								
21	1.69-05	1.39-05	1.15-05	9.40-06	7.27-06									
20	1.93-05	1.58-05	1.28-05	9.83-06										
19	2.21-05	1.77-05	1.35-05											
18	2.50-05	1.89-05												
17	2.69-05													

H TE = 2.00+04 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	6.50-38	6.83-38	7.48-38	7.97-38	9.14-38	1.32-37	2.42-37	4.84-37	9.48-37	1.76-36	3.10-36	5.20-36	8.35-36
45	0.00+00	9.04-38	9.88-38	1.17-37	1.43-37	1.92-37	3.03-37	5.38-37	9.97-37	1.82-36	3.22-36	5.47-36	8.96-36	1.42-35
40	0.00+00	1.31-37	1.49-37	1.90-37	2.56-37	3.75-37	6.04-37	1.04-36	1.83-36	3.20-36	5.44-36	9.01-36	1.45-35	2.28-35
35	0.00+00	1.97-37	2.34-37	3.21-37	4.66-37	7.15-37	1.16-36	1.93-36	3.24-36	5.41-36	8.90-36	1.44-35	2.28-35	3.55-35
30	0.00+00	3.13-37	3.84-37	5.55-37	8.44-37	1.32-36	2.11-36	3.39-36	5.44-36	8.71-36	1.38-35	2.17-35	3.39-35	5.26-35
29	0.00+00	3.46-37	4.26-37	6.20-37	9.48-37	1.48-36	2.36-36	3.76-36	5.99-36	9.50-36	1.50-35	2.34-35	3.64-35	5.64-35
28	0.00+00	3.83-37	4.73-37	6.94-37	1.06-36	1.66-36	2.63-36	4.16-36	6.56-36	1.03-35	1.61-35	2.51-35	3.89-35	6.03-35
27	0.00+00	4.26-37	5.27-37	7.77-37	1.19-36	1.87-36	2.93-36	4.59-36	7.18-36	1.12-35	1.73-35	2.68-35	4.15-35	6.42-35
26	0.00+00	4.76-37	5.90-37	8.71-37	1.34-36	2.09-36	3.26-36	5.06-36	7.84-36	1.21-35	1.86-35	2.86-35	4.41-35	6.82-35
25	0.00+00	5.34-37	6.61-37	9.80-37	1.51-36	2.34-36	3.63-36	5.59-36	8.58-36	1.31-35	2.00-35	3.06-35	4.68-35	7.22-35
24	0.00+00	6.01-37	7.45-37	1.11-36	1.70-36	2.63-36	4.05-36	6.20-36	9.42-36	1.43-35	2.16-35	3.27-35	4.97-35	7.61-35
23	0.00+00	6.81-37	8.44-37	1.25-36	1.93-36	2.97-36	4.55-36	6.91-36	1.04-35	1.56-35	2.34-35	3.50-35	5.26-35	7.95-35
22	0.00+00	7.77-37	9.62-37	1.43-36	2.20-36	3.38-36	5.16-36	7.80-36	1.17-35	1.73-35	2.56-35	3.78-35	5.55-35	8.08-35
21	0.00+00	8.93-37	1.11-36	1.65-36	2.53-36	3.90-36	5.93-36	8.93-36	1.33-35	1.96-35	2.85-35	4.10-35	5.75-35	7.62-35
20	0.00+00	1.03-36	1.28-36	1.91-36	2.95-36	4.55-36	6.93-36	1.04-35	1.55-35	2.26-35	3.23-35	4.45-35	5.63-35	5.28-35
19	0.00+00	1.21-36	1.50-36	2.25-36	3.48-36	5.40-36	8.26-36	1.25-35	1.85-35	2.68-35	3.72-35	4.72-35	4.33-35	-3.55-35
18	0.00+00	1.43-36	1.78-36	2.68-36	4.18-36	6.53-36	1.01-35	1.53-35	2.28-35	3.28-35	4.35-35	4.47-35	-1.36-35	-3.97-34
17	0.00+00	1.71-36	2.14-36	3.24-36	5.12-36	8.10-36	1.27-35	1.95-35	2.93-35	4.15-35	4.98-35	1.78-35	-2.64-34	-2.41-33
16	0.00+00	2.07-36	2.60-36	3.99-36	6.40-36	1.03-35	1.65-35	2.59-35	3.94-35	5.43-35	4.78-35	-1.31-34	-1.74-33	-2.80-32
15	0.00+00	2.54-36	3.23-36	5.02-36	8.22-36	1.36-35	2.23-35	3.62-35	5.57-35	7.04-35	-1.59-35	-1.12-33	-2.18-32	
14	0.00+00	3.17-36	4.08-36	6.48-36	1.09-35	1.86-35	3.18-35	5.36-35	8.31-35	7.06-35	-5.95-34	-1.59-32		
13	0.00+00	4.04-36	5.28-36	8.60-36	1.50-35	2.67-35	4.83-35	8.57-35	1.26-34	-1.81-34	-1.07-32			
12	0.00+00	5.27-36	7.03-36	1.18-35	2.16-35	4.11-35	8.03-35	1.51-34	1.10-34	-6.35-33				
11	0.00+00	7.08-36	9.71-36	1.71-35	3.34-35	6.96-35	1.52-34	2.82-34	-2.93-33					
10	0.00+00	9.85-36	1.41-35	2.64-35	5.68-35	1.37-34	3.52-34	-5.15-34						
9	0.00+00	1.44-35	2.17-35	4.48-35	1.13-34	3.47-34	9.20-34							
8	0.00+00	2.24-35	3.67-35	8.87-35	2.97-34	1.52-33								
7	0.00+00	3.83-35	7.19-35	2.33-34	1.52-33									
6	0.00+00	7.58-35	1.85-34	1.23-33										
5	0.00+00	1.96-34	9.24-34											
4	0.00+00	9.56-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.30-35	1.96-35	2.88-35	4.14-35	5.86-35	8.17-35	1.12-34	1.53-34	2.06-34	2.75-34	3.65-34	4.81-34	6.30-34	8.22-34
45	2.19-35	3.29-35	4.86-35	7.05-35	1.01-34	1.42-34	1.99-34	2.76-34	3.81-34	5.23-34	7.16-34	9.79-34	1.34-33	1.83-33
40	3.51-35	5.30-35	7.87-35	1.15-34	1.68-34	2.42-34	3.47-34	4.96-34	7.09-34	1.01-33	1.46-33	2.11-33	3.07-33	4.54-33
35	5.45-35	8.28-35	1.25-34	1.86-34	2.78-34	4.14-34	6.19-34	9.30-34	1.41-33	2.18-33	3.43-33	5.55-33	9.32-33	1.65-32
30	8.12-35	1.25-34	1.93-34	3.00-34	4.70-34	7.47-34	1.22-33	2.04-33	3.60-33	6.79-33	1.42-32	3.54-32	1.21-31	9.21-31
29	8.73-35	1.35-34	2.10-34	3.30-34	5.26-34	8.55-34	1.43-33	2.51-33	4.70-33	9.73-33	2.39-32	8.04-32	6.00-31	
28	9.35-35	1.46-34	2.29-34	3.64-34	5.90-34	9.85-34	1.72-33	3.18-33	6.48-33	1.56-32	5.11-32	3.71-31		
27	9.98-35	1.56-34	2.48-34	4.01-34	6.65-34	1.15-33	2.09-33	4.19-33	9.76-33	3.08-32	2.13-31			
26	1.06-34	1.67-34	2.68-34	4.40-34	7.49-34	1.34-33	2.60-33	5.80-33	1.70-32	1.07-31				
25	1.13-34	1.78-34	2.88-34	4.78-34	8.30-34	1.54-33	3.16-33	8.02-33	3.80-32					
24	1.18-34	1.86-34	2.99-34	4.92-34	8.38-34	1.46-33	2.33-33	-4.81-33						
23	1.21-34	1.85-34	2.80-34	4.02-34	4.17-34	-1.08-33	-2.98-32							
22	1.15-34	1.53-34	1.49-34	-1.76-34	-2.95-33	-4.30-32								
21	8.42-35	1.81-35	-4.58-34	-3.77-33	-4.83-32									
20	-3.27-35	-5.41-34	-3.89-33	-4.85-32										
19	-5.02-34	-3.59-33	-4.53-32											
18	-3.06-33	-4.04-32												
17	-3.44-32													

H TE = 2.00+04 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 1.429-13 4-2 RC = 1.612-14 4-2 EM = 6.589-26 2S RC = 5.065-14 2P RC = 9.229-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.95-04	1.83-04	7.85-05	4.07-05	2.38-05	1.51-05	1.01-05	7.15-06	5.23-06	3.94-06	3.04-06	2.40-06	1.92-06	1.56-06
45	7.86-04	2.41-04	1.04-04	5.39-05	3.15-05	1.99-05	1.34-05	9.48-06	6.93-06	5.22-06	4.03-06	3.18-06	2.55-06	2.08-06
40	1.08-03	3.31-04	1.43-04	7.41-05	4.33-05	2.75-05	1.85-05	1.31-05	9.57-06	7.21-06	5.57-06	4.39-06	3.52-06	2.87-06
35	1.55-03	4.78-04	2.06-04	1.07-04	6.29-05	4.00-05	2.70-05	1.91-05	1.40-05	1.06-05	8.16-06	6.43-06	5.17-06	4.21-06
30	2.36-03	7.29-04	3.17-04	1.66-04	9.76-05	6.23-05	4.22-05	2.99-05	2.20-05	1.66-05	1.29-05	1.02-05	8.17-06	6.67-06
29	2.59-03	8.00-04	3.48-04	1.82-04	1.08-04	6.88-05	4.66-05	3.31-05	2.43-05	1.84-05	1.43-05	1.13-05	9.06-06	7.39-06
28	2.85-03	8.80-04	3.83-04	2.01-04	1.19-04	7.61-05	5.17-05	3.67-05	2.70-05	2.05-05	1.59-05	1.25-05	1.01-05	8.23-06
27	3.14-03	9.71-04	4.24-04	2.23-04	1.32-04	8.47-05	5.76-05	4.09-05	3.01-05	2.28-05	1.77-05	1.40-05	1.13-05	9.19-06
26	3.48-03	1.08-03	4.71-04	2.48-04	1.47-04	9.46-05	6.44-05	4.58-05	3.38-05	2.56-05	1.99-05	1.57-05	1.27-05	1.03-05
25	3.87-03	1.20-03	5.25-04	2.78-04	1.65-04	1.06-04	7.24-05	5.16-05	3.81-05	2.89-05	2.24-05	1.77-05	1.43-05	1.16-05
24	4.33-03	1.34-03	5.88-04	3.12-04	1.86-04	1.20-04	8.19-05	5.84-05	4.31-05	3.27-05	2.54-05	2.01-05	1.62-05	1.32-05
23	4.86-03	1.50-03	6.62-04	3.53-04	2.11-04	1.36-04	9.31-05	6.65-05	4.91-05	3.73-05	2.90-05	2.29-05	1.85-05	1.50-05
22	5.50-03	1.69-03	7.51-04	4.01-04	2.40-04	1.56-04	1.07-04	7.62-05	5.63-05	4.28-05	3.32-05	2.63-05	2.11-05	1.72-05
21	6.25-03	1.93-03	8.57-04	4.60-04	2.76-04	1.79-04	1.23-04	8.79-05	6.50-05	4.94-05	3.84-05	3.03-05	2.44-05	1.98-05
20	7.16-03	2.21-03	9.86-04	5.31-04	3.20-04	2.08-04	1.43-04	1.02-04	7.55-05	5.74-05	4.45-05	3.52-05	2.82-05	2.29-05
19	8.25-03	2.55-03	1.14-03	6.18-04	3.73-04	2.43-04	1.67-04	1.20-04	8.84-05	6.71-05	5.20-05	4.10-05	3.28-05	2.65-05
18	9.59-03	2.97-03	1.34-03	7.27-04	4.40-04	2.87-04	1.97-04	1.41-04	1.04-04	7.91-05	6.12-05	4.81-05	3.83-05	3.07-05
17	1.13-02	3.51-03	1.59-03	8.64-04	5.24-04	3.41-04	2.35-04	1.68-04	1.24-04	9.39-05	7.25-05	5.67-05	4.48-05	3.52-05
16	1.34-02	4.19-03	1.91-03	1.04-03	6.30-04	4.11-04	2.82-04	2.02-04	1.49-04	1.12-04	8.64-05	6.70-05	5.19-05	3.83-05
15	1.61-02	5.07-03	2.31-03	1.26-03	7.66-04	5.00-04	3.43-04	2.45-04	1.80-04	1.36-04	1.03-04	7.87-05	5.72-05	
14	1.97-02	6.22-03	2.85-03	1.56-03	9.45-04	6.16-04	4.22-04	3.01-04	2.20-04	1.64-04	1.23-04	8.78-05		
13	2.45-02	7.76-03	3.56-03	1.95-03	1.18-03	7.70-04	5.27-04	3.74-04	2.72-04	1.99-04	1.40-04			
12	3.11-02	9.88-03	4.54-03	2.48-03	1.50-03	9.79-04	6.68-04	4.70-04	3.35-04	2.30-04				
11	4.05-02	1.28-02	5.90-03	3.23-03	1.96-03	1.27-03	8.59-04	5.94-04	3.97-04					
10	5.41-02	1.71-02	7.88-03	4.30-03	2.60-03	1.68-03	1.11-03	7.23-04						
9	7.46-02	2.36-02	1.08-02	5.91-03	3.55-03	2.25-03	1.41-03							
8	1.07-01	3.38-02	1.55-02	8.42-03	4.99-03	2.97-03								
7	1.63-01	5.10-02	2.33-02	1.25-02	6.95-03									
6	2.64-01	8.21-02	3.70-02	1.87-02										
5	4.76-01	1.45-01	6.16-02											
4	1.00+00	2.81-01												
3	2.74+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.29-06	1.08-06	9.08-07	7.73-07	6.63-07	5.73-07	4.98-07	4.36-07	3.84-07	3.40-07	3.02-07	2.70-07	2.42-07	2.18-07
45	1.71-06	1.43-06	1.21-06	1.03-06	8.80-07	7.60-07	6.61-07	5.79-07	5.09-07	4.51-07	4.01-07	3.57-07	3.20-07	2.88-07
40	2.37-06	1.98-06	1.67-06	1.42-06	1.22-06	1.05-06	9.14-07	8.00-07	7.04-07	6.22-07	5.53-07	4.93-07	4.41-07	3.97-07
35	3.47-06	2.90-06	2.45-06	2.08-06	1.78-06	1.54-06	1.34-06	1.17-06	1.03-06	9.10-07	8.07-07	7.18-07	6.41-07	5.73-07
30	5.51-06	4.60-06	3.88-06	3.30-06	2.83-06	2.44-06	2.12-06	1.85-06	1.62-06	1.42-06	1.25-06	1.09-06	9.43-07	7.69-07
29	6.10-06	5.10-06	4.30-06	3.66-06	3.13-06	2.70-06	2.34-06	2.04-06	1.78-06	1.56-06	1.36-06	1.17-06	9.50-07	
28	6.79-06	5.67-06	4.78-06	4.07-06	3.48-06	3.00-06	2.60-06	2.26-06	1.96-06	1.70-06	1.46-06	1.18-06		
27	7.60-06	6.34-06	5.35-06	4.54-06	3.88-06	3.34-06	2.89-06	2.50-06	2.16-06	1.84-06	1.48-06			
26	8.53-06	7.12-06	6.00-06	5.09-06	4.35-06	3.73-06	3.21-06	2.76-06	2.34-06	1.88-06				
25	9.62-06	8.02-06	6.75-06	5.72-06	4.88-06	4.17-06	3.56-06	3.00-06	2.40-06					
24	1.09-05	9.08-06	7.63-06	6.45-06	5.47-06	4.64-06	3.89-06	3.09-06						
23	1.24-05	1.03-05	8.65-06	7.28-06	6.13-06	5.11-06	4.02-06							
22	1.42-05	1.18-05	9.81-06	8.20-06	6.78-06	5.30-06								
21	1.63-05	1.34-05	1.11-05	9.11-06	7.08-06									
20	1.87-05	1.53-05	1.24-05	9.58-06										
19	2.15-05	1.73-05	1.32-05											
18	2.44-05	1.84-05												
17	2.63-05													

H TE = 2.00+04 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	6.21-38	5.53-38	3.42-38	-2.27-38	-1.33-37	-3.12-37	-5.76-37	-9.41-37	-1.43-36	-2.06-36	-2.89-36	-3.99-36	-5.48-36
45	0.00+00	8.71-38	8.35-38	7.01-38	2.63-38	-5.72-38	-1.81-37	-3.37-37	-5.03-37	-6.48-37	-7.26-37	-6.89-37	-4.85-37	-8.21-38
40	0.00+00	1.27-37	1.30-37	1.32-37	1.17-37	9.08-38	8.19-38	1.48-37	3.84-37	9.34-37	2.00-36	3.85-36	6.85-36	1.14-35
35	0.00+00	1.93-37	2.09-37	2.41-37	2.79-37	3.56-37	5.49-37	1.00-36	1.94-36	3.72-36	6.87-36	1.21-35	2.06-35	3.37-35
30	0.00+00	3.14-37	3.58-37	4.58-37	6.18-37	9.16-37	1.52-36	2.72-36	5.02-36	9.18-36	1.64-35	2.86-35	4.87-35	8.11-35
29	0.00+00	3.49-37	4.04-37	5.27-37	7.28-37	1.10-36	1.84-36	3.28-36	6.00-36	1.09-35	1.94-35	3.38-35	5.77-35	9.66-35
28	0.00+00	3.90-37	4.56-37	6.07-37	8.59-37	1.32-36	2.22-36	3.94-36	7.16-36	1.29-35	2.30-35	4.00-35	6.84-35	1.15-34
27	0.00+00	4.37-37	5.17-37	7.02-37	1.02-36	1.59-36	2.67-36	4.73-36	8.53-36	1.53-35	2.71-35	4.73-35	8.14-35	1.38-34
26	0.00+00	4.91-37	5.88-37	8.15-37	1.20-36	1.90-36	3.22-36	5.67-36	1.02-35	1.81-35	3.21-35	5.61-35	9.70-35	1.67-34
25	0.00+00	5.54-37	6.71-37	9.47-37	1.42-36	2.28-36	3.86-36	6.78-36	1.21-35	2.15-35	3.79-35	6.65-35	1.16-34	2.02-34
24	0.00+00	6.28-37	7.69-37	1.10-36	1.69-36	2.73-36	4.63-36	8.08-36	1.43-35	2.54-35	4.48-35	7.89-35	1.39-34	2.45-34
23	0.00+00	7.15-37	8.84-37	1.29-36	2.00-36	3.26-36	5.53-36	9.61-36	1.69-35	2.99-35	5.29-35	9.38-35	1.67-34	3.01-34
22	0.00+00	8.17-37	1.02-36	1.51-36	2.37-36	3.89-36	6.59-36	1.14-35	2.00-35	3.52-35	6.25-35	1.12-34	2.02-34	3.73-34
21	0.00+00	9.39-37	1.18-36	1.77-36	2.81-36	4.63-36	7.83-36	1.35-35	-2.35-35	4.15-35	7.39-35	1.33-34	2.46-34	4.70-34
20	0.00+00	1.09-36	1.37-36	2.08-36	3.34-36	5.51-36	9.29-36	1.59-35	2.77-35	4.88-35	8.74-35	1.60-34	3.03-34	6.04-34
19	0.00+00	1.26-36	1.61-36	2.46-36	3.96-36	6.56-36	1.10-35	1.88-35	3.26-35	5.75-35	1.04-34	1.94-34	3.79-34	7.99-34
18	0.00+00	1.49-36	1.89-36	2.92-36	4.73-36	7.84-36	1.32-35	2.24-35	3.87-35	6.84-35	1.25-34	2.37-34	4.81-34	1.08-33
17	0.00+00	1.76-36	2.26-36	3.50-36	5.70-36	9.47-36	1.59-35	2.70-35	4.67-35	8.27-35	1.52-34	2.92-34	5.96-34	1.27-33
16	0.00+00	2.12-36	2.72-36	4.25-36	6.98-36	1.16-35	1.96-35	3.34-35	5.79-35	1.02-34	1.85-34	3.34-34	4.33-34	-4.95-33
15	0.00+00	2.59-36	3.34-36	5.26-36	8.73-36	1.47-35	2.51-35	4.31-35	7.48-35	1.30-34	2.08-34	7.21-35	-6.84-33	
14	0.00+00	3.22-36	4.18-36	6.67-36	1.13-35	1.94-35	3.37-35	5.90-35	1.02-34	1.58-34	-7.63-36	-6.69-33		
13	0.00+00	4.08-36	5.36-36	8.73-36	1.51-35	2.69-35	4.85-35	8.75-35	1.46-34	5.16-35	-5.41-33			
12	0.00+00	5.31-36	7.09-36	1.19-35	2.14-35	4.01-35	7.68-35	1.44-34	1.56-34	-3.68-33				
11	0.00+00	7.11-36	9.74-36	1.70-35	3.26-35	6.61-35	1.39-34	2.51-34	-1.91-33					
10	0.00+00	9.88-36	1.40-35	2.61-35	5.47-35	1.26-34	3.04-34	-3.90-34						
9	0.00+00	1.44-35	2.16-35	4.40-35	1.07-34	3.10-34	6.90-34							
8	0.00+00	2.24-35	3.65-35	8.65-35	2.76-34	1.26-33								
7	0.00+00	3.83-35	7.14-35	2.25-34	1.36-33									
6	0.00+00	7.58-35	1.83-34	1.16-33										
5	0.00+00	1.96-34	9.07-34											
4	0.00+00	9.55-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-7.54-36	-1.05-35	-1.47-35	-2.10-35	-3.02-35	-4.39-35	-6.41-35	-9.37-35	-1.37-34	-2.00-34	-2.92-34	-4.23-34	-6.11-34	-8.79-34
45	5.19-37	1.25-36	1.92-36	2.14-36	1.19-36	-2.17-36	-9.96-36	-2.55-35	-5.39-35	-1.03-34	-1.86-34	-3.21-34	-5.38-34	-8.82-34
40	1.82-35	2.78-35	4.11-35	5.91-35	8.27-35	1.13-34	1.51-34	1.96-34	2.47-34	2.99-34	3.43-34	3.58-34	3.03-34	9.83-35
35	5.37-35	8.36-35	1.28-34	1.92-34	2.86-34	4.22-34	6.20-34	9.09-34	1.33-33	1.96-33	2.91-33	4.38-33	6.70-33	1.05-32
30	1.33-34	2.16-34	3.48-34	5.62-34	9.13-34	1.50-33	2.52-33	4.36-33	7.89-33	1.53-32	3.27-32	8.26-32	2.86-31	2.13-30
29	1.60-34	2.63-34	4.31-34	7.11-34	1.19-33	2.02-33	3.54-33	6.49-33	1.27-32	2.77-32	7.12-32	2.51-31	1.92-30	
28	1.93-34	3.22-34	5.38-34	9.10-34	1.57-33	2.78-33	5.16-33	1.02-32	2.25-32	5.87-32	2.10-31	1.63-30		
27	2.34-34	3.98-34	6.80-34	1.18-33	2.12-33	3.98-33	7.98-33	1.77-32	4.66-32	1.68-31	1.32-30			
26	2.86-34	4.96-34	8.73-34	1.58-33	2.98-33	6.02-33	1.34-32	3.55-32	1.29-31	1.02-30				
25	3.53-34	6.27-34	1.14-33	2.17-33	4.40-33	9.86-33	2.61-32	9.47-32	7.45-31					
24	4.39-34	8.06-34	1.54-33	3.12-33	7.00-33	1.85-32	6.68-32	5.20-31						
23	5.59-34	1.06-33	2.16-33	4.82-33	1.26-32	4.51-32	3.44-31							
22	7.19-34	1.45-33	3.21-33	8.32-33	2.91-32	2.15-31								
21	9.46-34	2.08-33	5.28-33	1.79-32	1.26-31									
20	1.30-33	3.23-33	1.05-32	6.84-32										
19	1.90-33	5.75-33	3.26-32											
18	2.89-33	1.17-32												
17	4.39-34													

H TE = 2.00+04 NE = 1.00+05 CASE B NC = 64

TOTAL RC = 1.432-13 4-2 RC = 1.615-14 4-2 EM = 6.599-26 2S RC = 5.072-14 2P RC = 9.243-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.44-04	1.98-04	8.50-05	4.40-05	2.57-05	1.63-05	1.09-05	7.72-06	5.64-06	4.25-06	3.28-06	2.58-06	2.07-06	1.69-06
45	8.66-04	2.66-04	1.14-04	5.92-05	3.45-05	2.19-05	1.47-05	1.04-05	7.58-06	5.71-06	4.41-06	3.47-06	2.78-06	2.26-06
40	1.19-03	3.66-04	1.57-04	8.15-05	4.76-05	3.01-05	2.03-05	1.43-05	1.05-05	7.87-06	6.07-06	4.78-06	3.83-06	3.12-06
35	1.70-03	5.21-04	2.24-04	1.16-04	6.78-05	4.29-05	2.89-05	2.04-05	1.49-05	1.12-05	8.66-06	6.82-06	5.47-06	4.45-06
30	2.55-03	7.84-04	3.38-04	1.75-04	1.02-04	6.48-05	4.37-05	3.08-05	2.25-05	1.70-05	1.31-05	1.03-05	8.27-06	6.72-06
29	2.80-03	8.59-04	3.70-04	1.92-04	1.12-04	7.12-05	4.79-05	3.38-05	2.47-05	1.86-05	1.44-05	1.13-05	9.07-06	7.38-06
28	3.08-03	9.46-04	4.07-04	2.11-04	1.24-04	7.84-05	5.28-05	3.73-05	2.73-05	2.05-05	1.59-05	1.25-05	1.00-05	8.14-06
27	3.40-03	1.04-03	4.50-04	2.34-04	1.37-04	8.68-05	5.85-05	4.13-05	3.02-05	2.28-05	1.76-05	1.38-05	1.11-05	9.02-06
26	3.77-03	1.16-03	5.00-04	2.60-04	1.52-04	9.66-05	6.51-05	4.60-05	3.36-05	2.54-05	1.96-05	1.54-05	1.24-05	1.00-05
25	4.20-03	1.29-03	5.58-04	2.90-04	1.70-04	1.08-04	7.28-05	5.14-05	3.76-05	2.84-05	2.19-05	1.73-05	1.38-05	1.12-05
24	4.70-03	1.45-03	6.25-04	3.25-04	1.91-04	1.21-04	8.19-05	5.79-05	4.24-05	3.20-05	2.47-05	1.94-05	1.56-05	1.27-05
23	5.28-03	1.63-03	7.03-04	3.67-04	2.15-04	1.37-04	9.26-05	6.55-05	4.80-05	3.62-05	2.80-05	2.20-05	1.76-05	1.43-05
22	5.96-03	1.84-03	7.96-04	4.16-04	2.44-04	1.56-04	1.05-04	7.45-05	5.47-05	4.13-05	3.19-05	2.51-05	2.01-05	1.63-05
21	6.76-03	2.08-03	9.06-04	4.74-04	2.79-04	1.78-04	1.21-04	8.55-05	6.27-05	4.74-05	3.66-05	2.88-05	2.31-05	1.87-05
20	7.73-03	2.38-03	1.04-03	5.44-04	3.21-04	2.05-04	1.39-04	9.88-05	7.25-05	5.48-05	4.24-05	3.34-05	2.67-05	2.16-05
19	8.89-03	2.74-03	1.20-03	6.30-04	3.73-04	2.39-04	1.62-04	1.15-04	8.46-05	6.39-05	4.94-05	3.89-05	3.11-05	2.51-05
18	1.03-02	3.18-03	1.39-03	7.35-04	4.36-04	2.80-04	1.91-04	1.35-04	9.96-05	7.53-05	5.81-05	4.57-05	3.63-05	2.91-05
17	1.21-02	3.72-03	1.63-03	8.67-04	5.16-04	3.32-04	2.26-04	1.61-04	1.18-04	8.95-05	6.90-05	5.40-05	4.27-05	3.36-05
16	1.43-02	4.39-03	1.94-03	1.03-03	6.17-04	3.98-04	2.72-04	1.94-04	1.42-04	1.07-04	8.25-05	6.41-05	4.97-05	3.68-05
15	1.71-02	5.25-03	2.33-03	1.25-03	7.49-04	4.85-04	3.31-04	2.36-04	1.73-04	1.30-04	9.90-05	7.56-05	5.51-05	
14	2.08-02	6.38-03	2.85-03	1.53-03	9.23-04	5.98-04	4.08-04	2.90-04	2.12-04	1.58-04	1.18-04	8.49-05		
13	2.56-02	7.89-03	3.55-03	1.92-03	1.16-03	7.49-04	5.11-04	3.62-04	2.63-04	1.92-04	1.35-04			
12	3.21-02	9.97-03	4.51-03	2.45-03	1.48-03	9.55-04	6.49-04	4.56-04	3.25-04	2.23-04				
11	4.13-02	1.29-02	5.87-03	3.19-03	1.92-03	1.24-03	8.37-04	5.77-04	3.86-04					
10	5.47-02	1.72-02	7.83-03	4.25-03	2.56-03	1.64-03	1.09-03	7.03-04						
9	7.51-02	2.36-02	1.08-02	5.85-03	3.50-03	2.20-03	1.37-03							
8	1.08-01	3.38-02	1.54-02	8.32-03	4.90-03	2.90-03								
7	1.63-01	5.09-02	2.31-02	1.23-02	6.80-03									
6	2.65-01	8.19-02	3.67-02	1.84-02										
5	4.76-01	1.44-01	6.08-02											
4	1.00+00	2.79-01												
3	2.73+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.39-06	1.16-06	9.78-07	8.32-07	7.13-07	6.16-07	5.36-07	4.69-07	4.13-07	3.65-07	3.25-07	2.90-07	2.60-07	2.34-07
45	1.87-06	1.56-06	1.31-06	1.12-06	9.58-07	8.27-07	7.20-07	6.30-07	5.54-07	4.90-07	4.35-07	3.89-07	3.48-07	3.13-07
40	2.57-06	2.15-06	1.81-06	1.54-06	1.32-06	1.14-06	9.90-07	8.66-07	7.62-07	6.73-07	5.98-07	5.33-07	4.77-07	4.29-07
35	3.67-06	3.06-06	2.58-06	2.19-06	1.88-06	1.62-06	1.41-06	1.23-06	1.08-06	9.56-07	8.45-07	7.52-07	6.71-07	6.00-07
30	5.54-06	4.62-06	3.89-06	3.30-06	2.83-06	2.44-06	2.11-06	1.84-06	1.61-06	1.41-06	1.24-06	1.09-06	9.38-07	7.66-07
29	6.08-06	5.07-06	4.27-06	3.62-06	3.10-06	2.67-06	2.31-06	2.01-06	1.76-06	1.53-06	1.34-06	1.15-06	9.36-07	
28	6.71-06	5.59-06	4.70-06	3.99-06	3.41-06	2.93-06	2.54-06	2.20-06	1.92-06	1.66-06	1.42-06	1.15-06		
27	7.43-06	6.19-06	5.21-06	4.41-06	3.77-06	3.24-06	2.80-06	2.42-06	2.09-06	1.78-06	1.43-06			
26	8.27-06	6.89-06	5.79-06	4.91-06	4.18-06	3.59-06	3.08-06	2.65-06	2.25-06	1.80-06				
25	9.26-06	7.71-06	6.47-06	5.48-06	4.66-06	3.98-06	3.40-06	2.87-06	2.29-06					
24	1.04-05	8.67-06	7.27-06	6.14-06	5.20-06	4.41-06	3.70-06	2.94-06						
23	1.18-05	9.80-06	8.20-06	6.90-06	5.81-06	4.84-06	3.82-06							
22	1.34-05	1.11-05	9.28-06	7.75-06	6.42-06	5.03-06								
21	1.54-05	1.27-05	1.05-05	8.63-06	6.72-06									
20	1.77-05	1.45-05	1.18-05	9.11-06										
19	2.03-05	1.64-05	1.26-05											
18	2.32-05	1.76-05												
17	2.52-05													

H TE = 2.00+04 NE = 1.00+05 CASE B NC = 64

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	5.92-38	4.24-38	-7.22-39	-1.30-37	-3.77-37	-8.13-37	-1.53-36	-2.67-36	-4.42-36	-7.05-36	-1.09-35	-1.66-35	-2.48-35
45	0.00+00	8.25-38	6.28-38	3.92-39	-1.46-37	-4.46-37	-9.80-37	-1.86-36	-3.27-36	-5.44-36	-8.75-36	-1.37-35	-2.11-35	-3.20-35
40	0.00+00	1.20-37	1.00-37	3.69-38	-1.30-37	-4.70-37	-1.07-36	-2.07-36	-3.66-36	-6.14-36	-9.98-36	-1.59-35	-2.49-35	-3.84-35
35	0.00+00	1.85-37	1.72-37	1.22-37	-2.94-38	-3.41-37	-8.86-37	-1.77-36	-3.15-36	-5.32-36	-8.74-36	-1.42-35	-2.28-35	-3.67-35
30	0.00+00	3.05-37	3.12-37	3.12-37	2.48-37	1.07-37	-9.86-38	-3.32-37	-5.49-37	-7.31-37	-9.35-37	-1.40-36	-2.68-36	-6.07-36
29	0.00+00	3.40-37	3.54-37	3.70-37	3.36-37	2.53-37	1.63-37	1.55-37	3.56-37	9.12-37	1.96-36	3.56-36	5.56-36	7.32-36
28	0.00+00	3.80-37	4.03-37	4.38-37	4.38-37	4.23-37	4.71-37	7.32-37	1.44-36	2.90-36	5.51-36	9.74-36	1.61-35	2.49-35
27	0.00+00	4.27-37	4.60-37	5.17-37	5.59-37	6.26-37	8.38-37	1.42-36	2.74-36	5.32-36	9.91-36	1.75-35	2.97-35	4.82-35
26	0.00+00	4.81-37	5.26-37	6.12-37	7.05-37	8.71-37	1.28-36	2.26-36	4.34-36	8.32-36	1.54-35	2.76-35	4.76-35	7.99-35
25	0.00+00	5.45-37	6.06-37	7.26-37	8.82-37	1.17-36	1.83-36	3.31-36	6.34-36	1.21-35	2.25-35	4.07-35	7.17-35	1.24-34
24	0.00+00	6.21-37	7.01-37	8.65-37	1.10-36	1.55-36	2.53-36	4.63-36	8.89-36	1.70-35	3.19-35	5.84-35	1.05-34	1.88-34
23	0.00+00	7.12-37	8.15-37	1.04-36	1.38-36	2.04-36	3.42-36	6.35-36	1.22-35	2.35-35	4.45-35	8.29-35	1.53-34	2.84-34
22	0.00+00	8.20-37	9.55-37	1.25-36	1.74-36	2.66-36	4.59-36	8.60-36	1.66-35	3.22-35	6.18-35	1.18-34	2.24-34	4.34-34
21	0.00+00	9.51-37	1.13-36	1.52-36	2.19-36	3.48-36	6.13-36	1.16-35	2.26-35	4.41-35	8.61-35	1.68-34	3.34-34	6.81-34
20	0.00+00	1.11-36	1.34-36	1.86-36	2.78-36	4.56-36	8.17-36	1.56-35	3.06-35	6.07-35	1.21-34	2.45-34	5.09-34	1.12-33
19	0.00+00	1.31-36	1.61-36	2.30-36	3.55-36	5.97-36	1.09-35	2.10-35	4.16-35	8.40-35	1.72-34	3.64-34	8.11-34	1.97-33
18	0.00+00	1.55-36	1.94-36	2.86-36	4.55-36	7.85-36	1.45-35	2.83-35	5.70-35	1.18-34	2.51-34	5.64-34	1.38-33	3.94-33
17	0.00+00	1.85-36	2.36-36	3.57-36	5.86-36	1.03-35	1.94-35	3.84-35	7.89-35	1.68-34	3.78-34	9.24-34	2.62-33	9.98-33
16	0.00+00	2.24-36	2.89-36	4.50-36	7.58-36	1.37-35	2.61-35	5.25-35	1.11-34	2.47-34	5.97-34	1.67-33	6.16-33	4.62-32
15	0.00+00	2.73-36	3.58-36	5.71-36	9.87-36	1.81-35	3.53-35	7.25-35	1.59-34	3.77-34	1.02-33	3.61-33	2.45-32	
14	0.00+00	3.38-36	4.49-36	7.33-36	1.30-35	2.43-35	4.83-35	1.02-34	2.36-34	6.16-34	2.03-33	1.17-32		
13	0.00+00	4.26-36	5.73-36	9.57-36	1.73-35	3.33-35	6.82-35	1.51-34	3.74-34	1.13-33	4.96-33			
12	0.00+00	5.49-36	7.50-36	1.28-35	2.39-35	4.76-35	1.02-34	2.40-34	6.55-34	1.80-33				
11	0.00+00	7.28-36	1.01-35	1.79-35	3.50-35	7.36-35	1.70-34	4.35-34	6.69-34					
10	0.00+00	1.00-35	1.44-35	2.67-35	5.61-35	1.31-34	3.43-34	5.47-34						
9	0.00+00	1.46-35	2.19-35	4.41-35	1.05-34	2.98-34	8.27-34							
8	0.00+00	2.26-35	3.65-35	8.48-35	2.60-34	1.11-33								
7	0.00+00	3.84-35	7.10-35	2.16-34	1.20-33									
6	0.00+00	7.59-35	1.80-34	1.08-33										
5	0.00+00	1.96-34	8.83-34											
4	0.00+00	9.53-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-3.65-35	-5.30-35	-7.59-35	-1.08-34	-1.51-34	-2.10-34	-2.90-34	-3.96-34	-5.38-34	-7.24-34	-9.69-34	-1.29-33	-1.70-33	-2.24-33
45	-4.77-35	-7.05-35	-1.03-34	-1.49-34	-2.14-34	-3.06-34	-4.33-34	-6.09-34	-8.52-34	-1.19-33	-1.65-33	-2.28-33	-3.14-33	-4.32-33
40	-5.88-35	-8.94-35	-1.35-34	-2.02-34	-3.02-34	-4.48-34	-6.62-34	-9.77-34	-1.44-33	-2.12-33	-3.13-33	-4.64-33	-6.90-33	-1.03-32
35	-5.89-35	-9.45-35	-1.52-34	-2.43-34	-3.90-34	-6.25-34	-1.01-33	-1.63-33	-2.65-33	-4.37-33	-7.32-33	-1.26-32	-2.23-32	-4.14-32
30	-1.42-35	-3.24-35	-7.14-35	-1.52-34	-3.15-34	-6.45-34	-1.32-33	-2.74-33	-5.90-33	-1.35-32	-3.38-32	-1.01-31	-4.10-31	-3.67-30
29	7.01-36	3.24-37	-2.23-35	-8.17-35	-2.22-34	-5.43-34	-1.27-33	-2.99-33	-7.32-33	-1.95-32	-6.08-32	-2.59-31	-2.41-30	
28	3.58-35	4.66-35	5.05-35	3.01-35	-5.80-35	-3.23-34	-1.06-33	-3.11-33	-9.35-33	-3.19-32	-1.46-31	-1.45-30		
27	7.53-35	1.13-34	1.61-34	2.12-34	2.36-34	1.37-34	-4.17-34	-2.66-33	-1.22-32	-6.64-32	-7.41-31			
26	1.31-34	2.11-34	3.34-34	5.20-34	7.91-34	1.15-33	1.42-33	2.87-34	-1.39-32	-2.58-31				
25	2.12-34	3.62-34	6.19-34	1.07-33	1.92-33	3.62-33	7.45-33	1.78-32	4.77-32					
24	3.36-34	6.06-34	1.12-33	2.17-33	4.52-33	1.09-32	3.44-32	2.20-31						
23	5.32-34	1.03-33	2.08-33	4.59-33	1.18-32	4.06-32	2.97-31							
22	8.63-34	1.81-33	4.14-33	1.11-32	4.01-32	3.10-31								
21	1.47-33	3.45-33	9.49-33	3.54-32	2.83-31									
20	2.69-33	7.55-33	2.87-32	2.34-31										
19	5.62-33	2.16-32	1.78-31											
18	1.52-32	1.24-31												
17	7.90-32													

H TE = 2.00+04 NE = 1.00+06 CASE B NC = 41

TOTAL RC = 1.436-13 4-2 RC = 1.618-14 4-2 EM = 6.614-26 2S RC = 5.083-14 2P RC = 9.272-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.62-04	2.03-04	8.72-05	4.52-05	2.64-05	1.67-05	1.12-05	7.92-06	5.79-06	4.36-06	3.36-06	2.65-06	2.12-06	1.73-06
45	9.03-04	2.77-04	1.19-04	6.17-05	3.60-05	2.28-05	1.53-05	1.08-05	7.90-06	5.95-06	4.59-06	3.61-06	2.90-06	2.36-06
40	1.27-03	3.90-04	1.68-04	8.69-05	5.07-05	3.21-05	2.16-05	1.52-05	1.11-05	8.37-06	6.46-06	5.09-06	4.08-06	3.32-06
35	1.86-03	5.71-04	2.45-04	1.27-04	7.41-05	4.69-05	3.16-05	2.23-05	1.63-05	1.22-05	9.44-06	7.43-06	5.96-06	4.85-06
30	2.84-03	8.71-04	3.74-04	1.94-04	1.13-04	7.16-05	4.82-05	3.39-05	2.48-05	1.87-05	1.44-05	1.13-05	9.07-06	7.37-06
29	3.11-03	9.53-04	4.10-04	2.12-04	1.24-04	7.84-05	5.27-05	3.71-05	2.71-05	2.04-05	1.57-05	1.24-05	9.92-06	8.07-06
28	3.41-03	1.05-03	4.50-04	2.33-04	1.36-04	8.60-05	5.78-05	4.07-05	2.98-05	2.24-05	1.73-05	1.36-05	1.09-05	8.84-06
27	3.75-03	1.15-03	4.94-04	2.56-04	1.49-04	9.46-05	6.36-05	4.48-05	3.27-05	2.46-05	1.90-05	1.49-05	1.20-05	9.72-06
26	4.14-03	1.27-03	5.46-04	2.83-04	1.65-04	1.04-04	7.02-05	4.95-05	3.61-05	2.72-05	2.10-05	1.65-05	1.32-05	1.07-05
25	4.58-03	1.41-03	6.04-04	3.13-04	1.83-04	1.16-04	7.76-05	5.48-05	4.00-05	3.01-05	2.32-05	1.82-05	1.46-05	1.19-05
24	5.10-03	1.56-03	6.72-04	3.48-04	2.03-04	1.29-04	8.66-05	6.10-05	4.45-05	3.35-05	2.58-05	2.03-05	1.62-05	1.32-05
23	5.70-03	1.75-03	7.52-04	3.90-04	2.27-04	1.44-04	9.69-05	6.82-05	4.98-05	3.75-05	2.89-05	2.27-05	1.81-05	1.47-05
22	6.41-03	1.97-03	8.47-04	4.39-04	2.56-04	1.62-04	1.09-04	7.68-05	5.61-05	4.22-05	3.25-05	2.55-05	2.04-05	1.65-05
21	7.27-03	2.23-03	9.60-04	4.98-04	2.90-04	1.84-04	1.24-04	8.72-05	6.37-05	4.79-05	3.69-05	2.89-05	2.31-05	1.87-05
20	8.30-03	2.55-03	1.10-03	5.69-04	3.32-04	2.10-04	1.42-04	9.98-05	7.28-05	5.47-05	4.21-05	3.31-05	2.64-05	2.13-05
19	9.55-03	2.93-03	1.26-03	6.56-04	3.83-04	2.43-04	1.63-04	1.15-04	8.41-05	6.32-05	4.86-05	3.81-05	3.03-05	2.44-05
18	1.11-02	3.40-03	1.47-03	7.62-04	4.46-04	2.83-04	1.90-04	1.34-04	9.79-05	7.35-05	5.65-05	4.42-05	3.50-05	2.80-05
17	1.30-02	3.98-03	1.72-03	8.95-04	5.24-04	3.33-04	2.24-04	1.58-04	1.15-04	8.65-05	6.63-05	5.17-05	4.07-05	3.20-05
16	1.53-02	4.71-03	2.04-03	1.06-03	6.22-04	3.96-04	2.67-04	1.88-04	1.37-04	1.03-04	7.86-05	6.09-05	4.72-05	3.69-05
15	1.83-02	5.63-03	2.44-03	1.27-03	7.49-04	4.77-04	3.22-04	2.27-04	1.65-04	1.24-04	9.39-05	7.15-05	5.22-05	
14	2.22-02	6.81-03	2.96-03	1.55-03	9.14-04	5.83-04	3.93-04	2.77-04	2.02-04	1.50-04	1.12-04	8.04-05		
13	2.73-02	8.36-03	3.65-03	1.92-03	1.13-03	7.24-04	4.89-04	3.44-04	2.49-04	1.82-04	1.28-04			
12	3.42-02	1.04-02	4.58-03	2.42-03	1.43-03	9.18-04	6.20-04	4.34-04	3.09-04	2.12-04				
11	4.38-02	1.33-02	5.88-03	3.13-03	1.86-03	1.19-03	7.99-04	5.50-04	3.68-04					
10	5.74-02	1.75-02	7.77-03	4.15-03	2.47-03	1.58-03	1.04-03	6.74-04						
9	7.78-02	2.38-02	1.07-02	5.71-03	3.39-03	2.12-03	1.32-03							
8	1.10-01	3.38-02	1.52-02	8.13-03	4.75-03	2.79-03								
7	1.64-01	5.08-02	2.28-02	1.20-02	6.59-03									
6	2.66-01	8.16-02	3.61-02	1.79-02										
5	4.76-01	1.43-01	5.95-02											
4	1.00+00	2.75-01												
3	2.72+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.43-06	1.19-06	1.00-06	8.53-07	7.32-07	6.32-07	5.50-07	4.81-07	4.23-07	3.75-07	3.33-07	2.97-07	2.66-07	2.40-07
45	1.94-06	1.62-06	1.37-06	1.16-06	9.97-07	8.61-07	7.49-07	6.55-07	5.76-07	5.10-07	4.53-07	4.04-07	3.62-07	3.26-07
40	2.74-06	2.28-06	1.92-06	1.63-06	1.40-06	1.21-06	1.05-06	9.20-07	8.09-07	7.15-07	6.35-07	5.66-07	5.06-07	4.55-07
35	3.99-06	3.33-06	2.80-06	2.38-06	2.04-06	1.76-06	1.53-06	1.34-06	1.17-06	1.04-06	9.18-07	8.17-07	7.29-07	6.51-07
30	6.07-06	5.06-06	4.26-06	3.61-06	3.09-06	2.66-06	2.31-06	2.01-06	1.76-06	1.54-06	1.35-06	1.18-06	1.02-06	8.34-07
29	6.64-06	5.53-06	4.65-06	3.95-06	3.38-06	2.91-06	2.52-06	2.19-06	1.91-06	1.67-06	1.45-06	1.25-06	1.02-06	
28	7.28-06	6.06-06	5.10-06	4.32-06	3.69-06	3.17-06	2.74-06	2.38-06	2.07-06	1.79-06	1.54-06	1.24-06		
27	8.00-06	6.66-06	5.59-06	4.74-06	4.05-06	3.47-06	3.00-06	2.59-06	2.23-06	1.90-06	1.53-06			
26	8.81-06	7.33-06	6.16-06	5.21-06	4.44-06	3.81-06	3.27-06	2.80-06	2.38-06	1.91-06				
25	9.75-06	8.10-06	6.80-06	5.75-06	4.89-06	4.17-06	3.56-06	3.00-06	2.39-06					
24	1.08-05	8.99-06	7.53-06	6.35-06	5.38-06	4.56-06	3.82-06	3.03-06						
23	1.21-05	1.00-05	8.37-06	7.03-06	5.91-06	4.93-06	3.89-06							
22	1.36-05	1.12-05	9.34-06	7.79-06	6.44-06	5.05-06								
21	1.53-05	1.26-05	1.04-05	8.54-06	6.65-06									
20	1.73-05	1.42-05	1.15-05	8.90-06										
19	1.97-05	1.59-05	1.21-05											
18	2.23-05	1.69-05												
17	2.40-05													

H TE = 2.00+04 NE = 1.00+06 CASE B NC = 41

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	5.82-38	3.69-38	-2.61-38	-1.84-37	-5.10-37	-1.11-36	-2.15-36	-3.83-36	-6.45-36	-1.04-35	-1.61-35	-2.44-35	-3.59-35
45	0.00+00	8.03-38	5.19-38	-3.32-38	-2.48-37	-6.94-37	-1.52-36	-2.96-36	-5.33-36	-9.04-36	-1.47-35	-2.31-35	-3.53-35	-5.27-35
40	0.00+00	1.16-37	7.76-38	-3.76-38	-3.33-37	-9.53-37	-2.12-36	-4.17-36	-7.58-36	-1.30-35	-2.15-35	-3.42-35	-5.33-35	-8.11-35
35	0.00+00	1.76-37	1.26-37	-2.78-38	-4.33-37	-1.30-36	-2.96-36	-5.92-36	-1.10-35	-1.92-35	-3.23-35	-5.28-35	-8.43-35	-1.32-34
30	0.00+00	2.88-37	2.33-37	4.81-38	-4.69-37	-1.61-36	-3.85-36	-7.98-36	-1.52-35	-2.76-35	-4.80-35	-8.17-35	-1.37-34	-2.26-34
29	0.00+00	3.21-37	2.68-37	8.27-38	-4.47-37	-1.63-36	-3.97-36	-8.32-36	-1.60-35	-2.92-35	-5.15-35	-8.86-35	-1.50-34	-2.52-34
28	0.00+00	3.61-37	3.10-37	1.28-37	-4.08-37	-1.62-36	-4.04-36	-8.57-36	-1.67-35	-3.08-35	-5.48-35	-9.55-35	-1.64-34	-2.81-34
27	0.00+00	4.06-37	3.61-37	1.88-37	-3.45-37	-1.56-36	-4.03-36	-8.71-36	-1.72-35	-3.20-35	-5.78-35	-1.02-34	-1.79-34	-3.12-34
26	0.00+00	4.60-37	4.23-37	2.64-37	-2.52-37	-1.46-36	-3.94-36	-8.68-36	-1.74-35	-3.29-35	-6.03-35	-1.09-34	-1.94-34	-3.46-34
25	0.00+00	5.24-37	4.98-37	3.61-37	-1.25-37	-1.29-36	-3.72-36	-8.44-36	-1.72-35	-3.32-35	-6.19-35	-1.14-34	-2.08-34	-3.83-34
24	0.00+00	5.99-37	5.88-37	4.83-37	4.49-38	-1.05-36	-3.37-36	-7.95-36	-1.66-35	-3.27-35	-6.24-35	-1.18-34	-2.22-34	-4.23-34
23	0.00+00	6.89-37	6.97-37	6.34-37	2.64-37	-7.15-37	-2.85-36	-7.16-36	-1.55-35	-3.13-35	-6.13-35	-1.19-34	-2.33-34	-4.65-34
22	0.00+00	7.97-37	8.30-37	8.21-37	5.42-37	-2.78-37	-2.14-36	-6.01-36	-1.37-35	-2.86-35	-5.80-35	-1.17-34	-2.41-34	-5.10-34
21	0.00+00	9.28-37	9.92-37	1.05-36	8.92-37	2.85-37	-1.19-36	-4.40-36	-1.10-35	-2.43-35	-5.16-35	-1.10-34	-2.42-34	-5.56-34
20	0.00+00	1.09-36	1.19-36	1.34-36	1.34-36	1.02-36	7.67-38	-2.15-36	-6.98-36	-1.73-35	-3.99-35	-9.30-35	-2.27-34	-5.91-34
19	0.00+00	1.29-36	1.44-36	1.71-36	1.92-36	2.01-36	1.84-36	1.11-36	-6.83-37	-5.68-36	-1.82-35	-5.42-35	-1.68-34	-5.60-34
18	0.00+00	1.53-36	1.76-36	2.20-36	2.71-36	3.38-36	4.39-36	6.04-36	9.03-36	1.46-35	2.46-35	3.70-35	2.42-35	-2.03-34
17	0.00+00	1.85-36	2.18-36	2.85-36	3.80-36	5.37-36	8.24-36	1.39-35	2.59-35	5.26-35	1.15-34	2.71-34	6.97-34	2.16-33
16	0.00+00	2.26-36	2.73-36	3.74-36	5.37-36	8.34-36	1.43-35	2.70-35	5.63-35	1.29-34	3.29-34	9.73-34	3.78-33	3.01-32
15	0.00+00	2.79-36	3.47-36	4.98-36	7.67-36	1.29-35	2.42-35	5.00-35	1.15-34	2.98-34	9.18-34	3.81-33	3.32-32	
14	0.00+00	3.50-36	4.49-36	6.77-36	1.11-35	2.02-35	4.10-35	9.25-35	2.38-34	7.35-34	3.11-33	2.78-32		
13	0.00+00	4.46-36	5.90-36	9.38-36	1.65-35	3.23-35	7.10-35	1.78-34	5.38-34	2.23-33	1.96-32			
12	0.00+00	5.80-36	7.93-36	1.33-35	2.51-35	5.33-35	1.29-34	3.75-34	1.48-33	1.21-32				
11	0.00+00	7.72-36	1.09-35	1.95-35	3.96-35	9.23-35	2.56-34	9.44-34	6.78-33					
10	0.00+00	1.06-35	1.56-35	2.96-35	6.60-35	1.74-34	5.99-34	3.64-33						
9	0.00+00	1.52-35	2.34-35	4.84-35	1.22-34	3.96-34	2.10-33							
8	0.00+00	2.32-35	3.83-35	8.98-35	2.83-34	1.45-33								
7	0.00+00	3.91-35	7.25-35	2.17-34	1.19-33									
6	0.00+00	7.66-35	1.80-34	1.02-33										
5	0.00+00	1.96-34	8.59-34											
4	0.00+00	9.52-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.19-35	-7.34-35	-1.02-34	-1.39-34	-1.87-34	-2.47-34	-3.21-34	-4.09-34	-5.13-34	-6.35-34	-7.77-34	-9.41-34	-1.13-33	-1.36-33
45	-7.72-35	-1.11-34	-1.57-34	-2.18-34	-2.99-34	-4.04-34	-5.37-34	-7.02-34	-9.07-34	-1.16-33	-1.46-33	-1.84-33	-2.30-33	-2.88-33
40	-1.21-34	-1.78-34	-2.59-34	-3.71-34	-5.24-34	-7.31-34	-1.01-33	-1.37-33	-1.86-33	-2.49-33	-3.33-33	-4.45-33	-5.98-33	-8.13-33
35	-2.05-34	-3.12-34	-4.72-34	-7.08-34	-1.05-33	-1.56-33	-2.29-33	-3.37-33	-4.94-33	-7.29-33	-1.09-32	-1.67-32	-2.64-32	-4.38-32
30	-3.70-34	-6.05-34	-9.88-34	-1.62-33	-2.66-33	-4.43-33	-7.50-33	-1.30-32	-2.35-32	-4.51-32	-9.59-32	-2.42-31	-8.41-31	-6.43-30
29	-4.20-34	-7.00-34	-1.17-33	-1.97-33	-3.35-33	-5.81-33	-1.03-32	-1.91-32	-3.75-32	-8.13-32	-2.09-31	-7.37-31	-5.71-30	
28	-4.78-34	-8.16-34	-1.40-33	-2.44-33	-4.32-33	-7.87-33	-1.49-32	-3.00-32	-6.66-32	-1.74-31	-6.28-31	-4.95-30		
27	-5.44-34	-9.56-34	-1.70-33	-3.08-33	-5.74-33	-1.12-32	-2.30-32	-5.24-32	-1.41-31	-5.17-31	-4.15-30			
26	-6.22-34	-1.13-33	-2.09-33	-3.99-33	-7.95-33	-1.69-32	-3.94-32	-1.09-31	-4.09-31	-3.37-30				
25	-7.13-34	-1.35-33	-2.64-33	-5.37-33	-1.17-32	-2.81-32	-7.97-32	-3.09-31	-2.61-30					
24	-8.21-34	-1.64-33	-3.43-33	-7.65-33	-1.89-32	-5.51-32	-2.20-31	-1.92-30						
23	-9.55-34	-2.05-33	-4.69-33	-1.19-32	-3.57-32	-1.47-31	-1.32-30							
22	-1.13-33	-2.66-33	-6.94-33	-2.15-32	-9.14-32	-8.51-31								
21	-1.36-33	-3.69-33	-1.18-32	-5.21-32	-5.03-31									
20	-1.70-33	-5.73-33	-2.65-32	-2.68-31										
19	-2.14-33	-1.10-32	-1.20-31											
18	-2.21-33	-3.42-32												
17	1.09-32													

H TE = 2.00+04 NE = 1.00+07 CASE B NC = 26

TOTAL RC = 1.443-13 4-2 RC = 1.626-14 4-2 EM = 6.645-26 2S RC = 5.102-14 2P RC = 9.329-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.62-04	2.03-04	8.74-05	4.52-05	2.64-05	1.67-05	1.13-05	7.93-06	5.80-06	4.37-06	3.37-06	2.65-06	2.13-06	1.73-06
45	9.08-04	2.79-04	1.20-04	6.20-05	3.62-05	2.29-05	1.54-05	1.09-05	7.94-06	5.98-06	4.62-06	3.64-06	2.91-06	2.37-06
40	1.29-03	3.96-04	1.70-04	8.82-05	5.14-05	3.26-05	2.19-05	1.54-05	1.13-05	8.50-06	6.55-06	5.16-06	4.14-06	3.37-06
35	1.92-03	5.89-04	2.53-04	1.31-04	7.65-05	4.84-05	3.26-05	2.29-05	1.68-05	1.26-05	9.73-06	7.66-06	6.14-06	4.99-06
30	3.02-03	9.27-04	3.98-04	2.06-04	1.20-04	7.61-05	5.12-05	3.60-05	2.63-05	1.98-05	1.53-05	1.20-05	9.62-06	7.82-06
29	3.33-03	1.02-03	4.39-04	2.27-04	1.33-04	8.39-05	5.64-05	3.97-05	2.90-05	2.18-05	1.68-05	1.32-05	1.06-05	8.61-06
28	3.69-03	1.13-03	4.86-04	2.52-04	1.47-04	9.28-05	6.24-05	4.39-05	3.21-05	2.41-05	1.86-05	1.46-05	1.17-05	9.52-06
27	4.09-03	1.25-03	5.39-04	2.79-04	1.63-04	1.03-04	6.92-05	4.87-05	3.56-05	2.68-05	2.06-05	1.62-05	1.30-05	1.05-05
26	4.54-03	1.39-03	5.99-04	3.10-04	1.81-04	1.14-04	7.69-05	5.41-05	3.95-05	2.97-05	2.29-05	1.80-05	1.44-05	1.17-05
25	5.07-03	1.55-03	6.68-04	3.46-04	2.01-04	1.27-04	8.57-05	6.03-05	4.40-05	3.31-05	2.55-05	2.01-05	1.60-05	1.30-05
24	5.67-03	1.71-03	7.37-04	3.87-04	2.25-04	1.43-04	9.59-05	6.75-05	4.93-05	3.70-05	2.85-05	2.24-05	1.79-05	1.45-05
23	6.37-03	1.95-03	8.36-04	4.38-04	2.53-04	1.60-04	1.08-04	7.57-05	5.52-05	4.15-05	3.20-05	2.51-05	2.01-05	1.63-05
22	7.17-03	2.20-03	9.45-04	4.89-04	2.85-04	1.80-04	1.21-04	8.52-05	6.22-05	4.67-05	3.59-05	2.82-05	2.25-05	1.82-05
21	8.11-03	2.49-03	1.07-03	5.53-04	3.22-04	2.04-04	1.37-04	9.63-05	7.02-05	5.27-05	4.06-05	3.18-05	2.54-05	2.05-05
20	9.21-03	2.82-03	1.21-03	6.27-04	3.65-04	2.31-04	1.55-04	1.09-04	7.96-05	5.98-05	4.59-05	3.60-05	2.87-05	2.31-05
19	1.05-02	3.22-03	1.38-03	7.16-04	4.17-04	2.64-04	1.77-04	1.24-04	9.07-05	6.81-05	5.23-05	4.09-05	3.25-05	2.61-05
18	1.21-02	3.70-03	1.59-03	8.23-04	4.79-04	3.03-04	2.03-04	1.43-04	1.04-04	7.80-05	5.98-05	4.67-05	3.70-05	2.95-05
17	1.40-02	4.29-03	1.84-03	9.54-04	5.56-04	3.51-04	2.36-04	1.66-04	1.20-04	9.01-05	6.90-05	5.36-05	4.22-05	3.31-05
16	1.64-02	5.03-03	2.16-03	1.12-03	6.51-04	4.12-04	2.76-04	1.94-04	1.41-04	1.05-04	8.02-05	6.19-05	4.78-05	3.53-05
15	1.95-02	5.98-03	2.57-03	1.33-03	7.75-04	4.89-04	3.28-04	2.30-04	1.67-04	1.24-04	9.39-05	7.13-05	5.19-05	
14	2.35-02	7.22-03	3.10-03	1.61-03	9.35-04	5.91-04	3.96-04	2.77-04	2.00-04	1.48-04	1.10-04	7.87-05		
13	2.89-02	8.85-03	3.81-03	1.97-03	1.15-03	7.25-04	4.85-04	3.38-04	2.43-04	1.77-04	1.24-04			
12	3.61-02	1.11-02	4.76-03	2.47-03	1.44-03	9.07-04	6.05-04	4.20-04	2.97-04	2.03-04				
11	4.61-02	1.41-02	6.07-03	3.15-03	1.84-03	1.16-03	7.69-04	5.25-04	3.50-04					
10	6.04-02	1.84-02	7.94-03	4.13-03	2.41-03	1.51-03	9.91-04	6.39-04						
9	8.18-02	2.47-02	1.07-02	5.59-03	3.26-03	2.02-03	1.29-03							
8	1.15-01	3.46-02	1.51-02	7.86-03	4.53-03	2.65-03								
7	1.71-01	5.10-02	2.23-02	1.15-02	6.29-03									
6	2.71-01	8.10-02	3.51-02	1.72-02										
5	4.80-01	1.41-01	5.77-02											
4	1.00+00	2.70-01												
3	2.71+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.43-06	1.19-06	1.00-06	8.54-07	7.33-07	6.33-07	5.51-07	4.82-07	4.24-07	3.75-07	3.33-07	2.98-07	2.67-07	2.40-07
45	1.96-06	1.63-06	1.37-06	1.17-06	1.00-06	8.66-07	7.53-07	6.59-07	5.80-07	5.13-07	4.55-07	4.06-07	3.64-07	3.27-07
40	2.77-06	2.31-06	1.95-06	1.66-06	1.42-06	1.23-06	1.07-06	9.33-07	8.20-07	7.25-07	6.44-07	5.74-07	5.14-07	4.61-07
35	4.11-06	3.43-06	2.89-06	2.45-06	2.10-06	1.81-06	1.58-06	1.38-06	1.21-06	1.07-06	9.46-07	8.41-07	7.50-07	6.71-07
30	6.44-06	5.36-06	4.51-06	3.83-06	3.27-06	2.82-06	2.44-06	2.13-06	1.86-06	1.63-06	1.43-06	1.25-06	1.08-06	8.81-07
29	7.09-06	5.91-06	4.97-06	4.21-06	3.60-06	3.10-06	2.68-06	2.33-06	2.03-06	1.78-06	1.55-06	1.33-06	1.08-06	
28	7.83-06	6.52-06	5.48-06	4.65-06	3.97-06	3.41-06	2.95-06	2.56-06	2.22-06	1.93-06	1.65-06	1.33-06		
27	8.67-06	7.22-06	6.06-06	5.13-06	4.38-06	3.76-06	3.24-06	2.80-06	2.41-06	2.06-06	1.66-06			
26	9.62-06	8.00-06	6.71-06	5.68-06	4.84-06	4.14-06	3.56-06	3.05-06	2.59-06	2.07-06				
25	1.07-05	8.89-06	7.46-06	6.30-06	5.36-06	4.57-06	3.89-06	3.28-06	2.62-06					
24	1.19-05	9.91-06	8.29-06	6.99-06	5.92-06	5.01-06	4.20-06	3.33-06						
23	1.33-05	1.11-05	9.24-06	7.76-06	6.52-06	5.42-06	4.28-06							
22	1.49-05	1.24-05	1.03-05	8.57-06	7.08-06	5.54-06								
21	1.68-05	1.38-05	1.14-05	9.35-06	7.27-06									
20	1.88-05	1.54-05	1.25-05	9.64-06										
19	2.11-05	1.70-05	1.30-05											
18	2.34-05	1.77-05												
17	2.47-05													

H TE = 2.00+04 NE = 1.00+07 CASE B NC = 26

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	5.77-38	3.32-38	-4.24-38	-2.36-37	-6.39-37	-1.37-36	-2.57-36	-4.45-36	-7.28-36	-1.14-35	-1.71-35	-2.49-35	-3.49-35
45	0.00+00	7.94-38	4.58-38	-5.87-38	-3.28-37	-8.91-37	-1.92-36	-3.62-36	-6.33-36	-1.04-35	-1.65-35	-2.51-35	-3.69-35	-5.23-35
40	0.00+00	1.14-37	6.58-38	-8.39-38	-4.74-37	-1.29-36	-2.81-36	-5.36-36	-9.45-36	-1.58-35	-2.53-35	-3.91-35	-5.84-35	-8.45-35
35	0.00+00	1.71-37	1.01-37	-1.23-37	-7.14-37	-1.98-36	-4.34-36	-8.39-36	-1.51-35	-2.56-35	-4.19-35	-6.63-35	-1.02-34	-1.52-34
30	0.00+00	2.75-37	1.69-37	-1.81-37	-1.12-36	-3.19-36	-7.13-36	-1.41-35	-2.60-35	-4.56-35	-7.71-35	-1.27-34	-2.03-34	-3.19-34
29	0.00+00	3.06-37	1.90-37	-1.93-37	-1.24-36	-3.53-36	-7.94-36	-1.58-35	-2.93-35	-5.18-35	-8.85-35	-1.47-34	-2.39-34	-3.80-34
28	0.00+00	3.41-37	2.16-37	-2.04-37	-1.36-36	-3.91-36	-8.86-36	-1.78-35	-3.32-35	-5.92-35	-1.02-34	-1.72-34	-2.83-34	-4.58-34
27	0.00+00	3.83-37	2.47-37	-2.14-37	-1.49-36	-4.33-36	-9.90-36	-2.00-35	-3.77-35	-6.80-35	-1.19-34	-2.03-34	-3.40-34	-5.59-34
26	0.00+00	4.32-37	2.88-37	-2.10-37	-1.61-36	-4.76-36	-1.10-35	-2.24-35	-4.27-35	-7.78-35	-1.38-34	-2.39-34	-4.09-34	-6.88-34
25	0.00+00	4.91-37	3.36-37	-2.05-37	-1.75-36	-5.25-36	-1.23-35	-2.53-35	-4.87-35	-9.01-35	-1.62-34	-2.87-34	-5.01-34	-8.67-34
24	0.00+00	5.60-37	3.97-37	-1.87-37	-1.88-36	-5.79-36	-1.37-35	-2.86-35	-5.57-35	-1.05-34	-1.92-34	-3.46-34	-6.23-34	-1.11-33
23	0.00+00	6.44-37	4.75-37	-1.50-37	-2.00-36	-6.34-36	-1.52-35	-3.22-35	-6.39-35	-1.22-34	-2.29-34	-4.26-34	-7.89-34	-1.47-33
22	0.00+00	7.45-37	5.75-37	-8.44-38	-2.09-36	-6.88-36	-1.68-35	-3.62-35	-7.32-35	-1.43-34	-2.76-34	-5.29-34	-1.02-33	-2.00-33
21	0.00+00	8.70-37	7.06-37	2.43-38	-2.13-36	-7.37-36	-1.85-35	-4.06-35	-8.37-35	-1.68-34	-3.34-34	-6.67-34	-1.35-33	-2.83-33
20	0.00+00	1.03-36	8.76-37	1.94-37	-2.08-36	-7.76-36	-2.01-35	-4.51-35	-9.55-35	-1.98-34	-4.09-34	-8.58-34	-1.86-33	-4.24-33
19	0.00+00	1.22-36	1.10-36	4.47-37	-1.90-36	-7.97-36	-2.15-35	-4.97-35	-1.09-34	-2.33-34	-5.07-34	-1.14-33	-2.69-33	-6.99-33
18	0.00+00	1.46-36	1.40-36	8.12-37	-1.55-36	-7.93-36	-2.26-35	-5.42-35	-1.23-34	-2.77-34	-6.43-34	-1.57-33	-4.21-33	-1.32-32
17	0.00+00	1.78-36	1.78-36	1.32-36	-9.66-37	-7.55-36	-2.32-35	-5.85-35	-1.39-34	-3.35-34	-8.45-34	-2.34-33	-7.62-33	-3.38-32
16	0.00+00	2.18-36	2.30-36	2.03-36	-7.97-38	-6.74-36	-2.34-35	-6.27-35	-1.59-34	-4.16-34	-1.19-33	-3.99-33	-1.83-32	-1.83-31
15	0.00+00	2.72-36	2.99-36	3.02-36	1.23-36	-5.32-36	-2.29-35	-6.69-35	-1.85-34	-5.47-34	-1.89-33	-8.97-33	-9.31-32	
14	0.00+00	3.43-36	3.95-36	4.43-36	3.23-36	-2.85-36	-2.08-35	-7.01-35	-2.20-34	-7.88-34	-3.86-33	-4.14-32		
13	0.00+00	4.42-36	5.30-36	6.54-36	6.47-36	1.86-36	-1.47-35	-6.61-35	-2.57-34	-1.31-33	-1.47-32			
12	0.00+00	5.82-36	7.31-36	9.88-36	1.22-35	1.18-35	3.87-36	-2.61-35	-1.83-34	-2.41-33				
11	0.00+00	7.89-36	1.04-35	1.55-35	2.30-35	3.51-35	6.62-35	2.27-34	2.14-33					
10	0.00+00	1.10-35	1.55-35	2.56-35	4.62-35	9.96-35	3.35-34	2.99-33						
9	0.00+00	1.61-35	2.42-35	4.59-35	1.04-34	3.36-34	2.58-33							
8	0.00+00	2.48-35	4.09-35	9.28-35	2.93-34	1.96-33								
7	0.00+00	4.14-35	7.80-35	2.35-34	1.43-33									
6	0.00+00	7.97-35	1.90-34	1.07-33										
5	0.00+00	2.01-34	8.59-34											
4	0.00+00	9.56-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-4.71-35	-6.13-35	-7.71-35	-9.40-35	-1.12-34	-1.30-34	-1.48-34	-1.68-34	-1.88-34	-2.09-34	-2.32-34	-2.51-34	-2.79-34	-3.09-34
45	-7.17-35	-9.49-35	-1.21-34	-1.51-34	-1.83-34	-2.17-34	-2.54-34	-2.95-34	-3.41-34	-3.92-34	-4.51-34	-5.08-34	-5.88-34	-6.86-34
40	-1.18-34	-1.60-34	-2.10-34	-2.68-34	-3.35-34	-4.13-34	-5.02-34	-6.07-34	-7.34-34	-8.90-34	-1.08-33	-1.31-33	-1.63-33	-2.07-33
35	-2.19-34	-3.08-34	-4.21-34	-5.62-34	-7.39-34	-9.63-34	-1.25-33	-1.63-33	-2.14-33	-2.86-33	-3.92-33	-5.42-33	-7.99-33	-1.25-32
30	-4.88-34	-7.31-34	-1.08-33	-1.56-33	-2.27-33	-3.31-33	-4.93-33	-7.58-33	-1.23-32	-2.13-32	-4.15-32	-9.53-32	-3.11-31	-2.25-30
29	-5.91-34	-9.02-34	-1.36-33	-2.03-33	-3.03-33	-4.61-33	-7.19-33	-1.18-32	-2.07-32	-4.06-32	-9.55-32	-3.08-31	-2.24-30	
28	-7.27-34	-1.13-33	-1.75-33	-2.70-33	-4.20-33	-6.69-33	-1.11-32	-1.98-32	-3.93-32	-9.30-32	-3.06-31	-2.21-30		
27	-9.08-34	-1.46-33	-2.32-33	-3.72-33	-6.07-33	-1.03-32	-1.86-32	-3.74-32	-8.94-32	-2.96-31	-2.14-30			
26	-1.15-33	-1.90-33	-3.15-33	-5.29-33	-9.18-33	-1.69-32	-3.45-32	-8.33-32	-2.79-31	-2.05-30				
25	-1.49-33	-2.57-33	-4.47-33	-8.00-33	-1.51-32	-3.14-32	-7.73-32	-2.62-31	-1.95-30					
24	-2.00-33	-3.61-33	-6.69-33	-1.30-32	-2.78-32	-6.99-32	-2.41-31	-1.82-30						
23	-2.76-33	-5.33-33	-1.08-32	-2.37-32	-6.11-32	-2.15-31	-1.65-30							
22	-4.01-33	-8.43-33	-1.93-32	-5.12-32	-1.85-31	-7.46-30								
21	-6.19-33	-1.47-32	-4.07-32	-1.52-31	-1.23-30									
20	-1.05-32	-3.04-32	-1.18-31	-9.89-31										
19	-2.09-32	-8.51-32	-7.43-31											
18	-5.63-32	-5.14-31												
17	-3.24-31													

H TE = 2.00+04 NE = 1.00+08 CASE B NC = 20

TOTAL RC = 1.457-13 4-2 RC = 1.655-14 4-2 EM = 6.764-26 2S RC = 5.147-14 2P RC = 9.425-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.52-04	2.00-04	8.59-05	4.45-05	2.60-05	1.64-05	1.11-05	7.80-06	5.70-06	4.29-06	3.31-06	2.61-06	2.09-06	1.70-06
45	8.94-04	2.74-04	1.18-04	6.11-05	3.56-05	2.26-05	1.52-05	1.07-05	7.82-06	5.89-06	4.54-06	3.58-06	2.87-06	2.33-06
40	1.27-03	3.91-04	1.68-04	8.70-05	5.07-05	3.21-05	2.16-05	1.52-05	1.11-05	8.38-06	6.47-06	5.09-06	4.08-06	3.32-06
35	1.90-03	5.84-04	2.51-04	1.30-04	7.57-05	4.79-05	3.23-05	2.27-05	1.66-05	1.25-05	9.64-06	7.59-06	6.08-06	4.94-06
30	3.02-03	9.26-04	3.98-04	2.06-04	1.20-04	7.60-05	5.11-05	3.60-05	2.63-05	1.98-05	1.53-05	1.20-05	9.61-06	7.81-06
29	3.34-03	1.02-03	4.40-04	2.28-04	1.33-04	8.41-05	5.66-05	3.98-05	2.91-05	2.19-05	1.69-05	1.33-05	1.06-05	8.64-06
28	3.71-03	1.14-03	4.89-04	2.53-04	1.48-04	9.34-05	6.28-05	4.42-05	3.23-05	2.43-05	1.87-05	1.47-05	1.18-05	9.58-06
27	4.14-03	1.27-03	5.45-04	2.82-04	1.64-04	1.04-04	6.99-05	4.92-05	3.60-05	2.70-05	2.08-05	1.64-05	1.31-05	1.07-05
26	4.63-03	1.42-03	6.09-04	3.15-04	1.84-04	1.16-04	7.82-05	5.51-05	4.02-05	3.02-05	2.33-05	1.83-05	1.46-05	1.19-05
25	5.20-03	1.59-03	6.84-04	3.54-04	2.06-04	1.31-04	8.78-05	6.18-05	4.51-05	3.39-05	2.61-05	2.05-05	1.64-05	1.33-05
24	5.86-03	1.80-03	7.72-04	4.00-04	2.33-04	1.47-04	9.90-05	6.97-05	5.08-05	3.82-05	2.94-05	2.31-05	1.85-05	1.50-05
23	6.65-03	2.04-03	8.75-04	4.53-04	2.64-04	1.67-04	1.12-04	7.89-05	5.75-05	4.32-05	3.33-05	2.61-05	2.09-05	1.69-05
22	7.57-03	2.32-03	9.96-04	5.15-04	3.00-04	1.90-04	1.28-04	8.97-05	6.54-05	4.92-05	3.78-05	2.97-05	2.37-05	1.92-05
21	8.66-03	2.65-03	1.14-03	5.89-04	3.43-04	2.17-04	1.46-04	1.03-04	7.48-05	5.61-05	4.32-05	3.38-05	2.70-05	2.18-05
20	9.95-03	3.05-03	1.31-03	6.77-04	3.94-04	2.49-04	1.67-04	1.18-04	8.57-05	6.43-05	4.94-05	3.87-05	3.08-05	2.49-05
19	1.15-02	3.52-03	1.51-03	7.82-04	4.55-04	2.88-04	1.93-04	1.36-04	9.89-05	7.41-05	5.69-05	4.45-05	3.54-05	2.84-05
18	1.34-02	4.09-03	1.76-03	9.08-04	5.29-04	3.34-04	2.24-04	1.57-04	1.15-04	8.58-05	6.58-05	5.13-05	4.06-05	3.24-05
17	1.56-02	4.78-03	2.05-03	1.06-03	6.17-04	3.90-04	2.61-04	1.83-04	1.33-04	9.97-05	7.62-05	5.93-05	4.65-05	3.65-05
16	1.83-02	5.62-03	2.41-03	1.25-03	7.24-04	4.57-04	3.06-04	2.15-04	1.56-04	1.16-04	8.86-05	6.83-05	5.28-05	3.89-05
15	2.17-02	6.64-03	2.85-03	1.47-03	8.55-04	5.39-04	3.61-04	2.53-04	1.83-04	1.36-04	1.03-04	7.80-05	5.67-05	
14	2.59-02	7.92-03	3.39-03	1.75-03	1.02-03	6.42-04	4.29-04	2.99-04	2.16-04	1.59-04	1.18-04	8.46-05		
13	3.12-02	9.55-03	4.09-03	2.11-03	1.23-03	7.72-04	5.15-04	3.58-04	2.56-04	1.86-04	1.30-04			
12	3.83-02	1.17-02	5.02-03	2.59-03	1.50-03	9.43-04	6.27-04	4.33-04	3.05-04	2.08-04				
11	4.83-02	1.48-02	6.32-03	3.25-03	1.88-03	1.18-03	7.78-04	5.28-04	3.50-04					
10	6.26-02	1.91-02	8.18-03	4.21-03	2.43-03	1.51-03	9.80-04	6.27-04						
9	8.41-02	2.56-02	1.09-02	5.62-03	3.22-03	1.97-03	1.21-03							
8	1.18-01	3.57-02	1.52-02	7.77-03	4.40-03	2.54-03								
7	1.75-01	5.22-02	2.21-02	1.12-02	5.98-03									
6	2.79-01	8.13-02	3.40-02	1.63-02										
5	4.90-01	1.38-01	5.49-02											
4	1.00+00	2.60-01												
3	2.67+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.40-06	1.17-06	9.88-07	8.40-07	7.21-07	6.23-07	5.42-07	4.74-07	4.17-07	3.69-07	3.28-07	2.93-07	2.62-07	2.36-07
45	1.92-06	1.61-06	1.35-06	1.15-06	9.87-07	8.53-07	7.41-07	6.49-07	5.71-07	5.05-07	4.48-07	4.00-07	3.58-07	3.22-07
40	2.74-06	2.28-06	1.92-06	1.64-06	1.40-06	1.21-06	1.05-06	9.20-07	8.09-07	7.15-07	6.35-07	5.66-07	5.07-07	4.55-07
35	4.07-06	3.40-06	2.86-06	2.43-06	2.08-06	1.80-06	1.56-06	1.36-06	1.20-06	1.06-06	9.36-07	8.33-07	7.43-07	6.64-07
30	6.43-06	5.36-06	4.51-06	3.83-06	3.27-06	2.82-06	2.44-06	2.13-06	1.86-06	1.63-06	1.43-06	1.25-06	1.08-06	8.81-07
29	7.11-06	5.92-06	4.98-06	4.22-06	3.61-06	3.11-06	2.69-06	2.34-06	2.04-06	1.78-06	1.55-06	1.33-06	1.08-06	
28	7.88-06	6.56-06	5.51-06	4.67-06	3.99-06	3.43-06	2.97-06	2.57-06	2.23-06	1.94-06	1.66-06	1.34-06		
27	8.76-06	7.29-06	6.13-06	5.19-06	4.43-06	3.80-06	3.28-06	2.83-06	2.44-06	2.08-06	1.67-06			
26	9.78-06	8.13-06	6.83-06	5.78-06	4.92-06	4.21-06	3.62-06	3.10-06	2.63-06	2.11-06				
25	1.10-05	9.10-06	7.63-06	6.45-06	5.48-06	4.67-06	3.98-06	3.36-06	2.68-06					
24	1.23-05	1.02-05	8.55-06	7.21-06	6.10-06	5.17-06	4.33-06	3.43-06						
23	1.39-05	1.15-05	9.61-06	8.07-06	6.78-06	5.64-06	4.44-06							
22	1.57-05	1.30-05	1.08-05	9.00-06	7.43-06	5.82-06								
21	1.78-05	1.47-05	1.21-05	9.92-06	7.71-06									
20	2.02-05	1.65-05	1.34-05	1.03-05										
19	2.29-05	1.84-05	1.41-05											
18	2.57-05	1.94-05												
17	2.72-05													

H TE = 2.00+04 NE = 1.00+08 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.11-31	5.46-38	2.07-38	-7.71-38	-2.99-37	-7.11-37	-1.41-36	-2.53-36	-4.19-36	-6.45-36	-9.20-36	1.22-35	-1.50-35	-1.75-35
45	1.53-31	7.51-38	2.84-38	-1.07-37	-4.16-37	-9.96-37	-1.99-36	-3.59-36	-5.99-36	-9.29-36	-1.34-35	-1.79-35	-2.24-35	-2.65-35
40	2.18-31	1.07-37	4.03-38	-1.56-37	-6.06-37	-1.46-36	-2.94-36	-5.35-36	-9.03-36	-1.42-35	-2.07-35	-2.82-35	-3.59-35	-4.34-35
35	3.27-31	1.61-37	6.01-38	-2.38-37	-9.33-37	-2.27-36	-4.63-36	-8.54-36	-1.46-35	-2.35-35	-3.51-35	-4.89-35	-6.40-35	-7.97-35
30	5.22-31	2.58-37	9.60-38	-3.92-37	-1.55-36	-3.82-36	-7.94-36	-1.50-35	-2.64-35	-4.36-35	-6.75-35	-9.79-35	-1.34-34	-1.76-34
29	5.78-31	2.86-37	1.07-37	-4.37-37	-1.73-36	-4.29-36	-8.97-36	-1.70-35	-3.02-35	-5.03-35	-7.86-35	-1.15-34	-1.60-34	-2.14-34
28	6.43-31	3.18-37	1.19-37	-4.89-37	-1.94-36	-4.84-36	-1.02-35	-1.95-35	-3.48-35	-5.85-35	-9.25-35	-1.37-34	-1.94-34	-2.63-34
27	7.18-31	3.56-37	1.34-37	-5.49-37	-2.19-36	-5.50-36	-1.16-35	-2.24-35	-4.04-35	-6.87-35	-1.10-34	-1.66-34	-2.38-34	-3.28-34
26	8.06-31	4.00-37	1.51-37	-6.19-37	-2.49-36	-6.27-36	-1.34-35	-2.60-35	-4.73-35	-8.15-35	-1.32-34	-2.03-34	-2.96-34	-4.19-34
25	9.08-31	4.52-37	1.72-37	-7.01-37	-2.83-36	-7.19-36	-1.55-35	-3.04-35	-5.60-35	-9.77-35	-1.61-34	-2.52-34	-3.77-34	-5.48-34
24	1.03-30	5.13-37	1.98-37	-7.96-37	-3.25-36	-8.30-36	-1.80-35	-3.58-35	-6.69-35	-1.19-34	-2.00-34	-3.19-34	-4.90-34	-7.36-34
23	1.17-30	5.87-37	2.30-37	-9.06-37	-3.74-36	-9.65-36	-2.12-35	-4.26-35	-8.09-35	-1.46-34	-2.52-34	-4.13-34	-6.56-34	-1.03-33
22	1.34-30	6.75-37	2.71-37	-1.03-36	-4.32-36	-1.13-35	-2.51-35	-5.13-35	-9.92-35	-1.83-34	-3.24-34	-5.49-34	-9.08-34	-1.49-33
21	1.55-30	7.83-37	3.24-37	-1.18-36	-5.02-36	-1.33-35	-2.99-35	-6.24-35	-1.23-34	-2.34-34	-4.27-34	-7.55-34	-1.31-33	-2.30-33
20	1.80-30	9.17-37	3.99-37	-1.33-36	-5.82-36	-1.57-35	-3.59-35	-7.65-35	-1.55-34	-3.04-34	-5.78-34	-1.07-33	-1.99-33	-3.80-33
19	2.11-30	1.08-36	4.99-37	-1.50-36	-6.80-36	-1.86-35	-4.37-35	-9.53-35	-2.00-34	-4.08-34	-8.16-34	-1.62-33	-3.26-33	-7.06-33
18	2.49-30	1.30-36	6.40-37	-1.67-36	-7.93-36	-2.23-35	-5.35-35	-1.21-34	-2.63-34	-5.65-34	-1.21-33	-2.61-33	-5.97-33	-1.56-32
17	2.97-30	1.57-36	8.44-37	-1.81-36	-9.21-36	-2.66-35	-6.61-35	-1.55-34	-3.56-34	-8.16-34	-1.90-33	-4.67-33	-1.29-32	-4.77-32
16	3.59-30	1.93-36	1.15-36	-1.88-36	-1.06-35	-3.19-35	-8.22-35	-2.02-34	-4.97-34	-1.25-33	-3.30-33	-9.83-33	-3.38-32	-3.18-31
15	4.39-30	2.42-36	1.61-36	-1.77-36	-1.20-35	-3.79-35	-1.03-34	-2.70-34	-7.24-34	-2.06-33	-6.65-33	-2.80-32	-2.46-31	
14	5.46-30	3.09-36	2.31-36	-1.36-36	-1.31-35	-4.46-35	-1.29-34	-3.71-34	-1.13-33	-3.92-33	-1.79-32	-1.70-31		
13	6.90-30	4.03-36	3.38-36	-4.48-37	-1.38-35	-5.21-35	-1.65-34	-5.36-34	-1.98-33	-9.76-33	-1.01-31			
12	8.92-30	5.38-36	5.01-36	1.24-36	-1.38-35	-6.09-35	-2.20-34	-8.62-34	-4.50-33	-5.01-32				
11	1.18-29	7.37-36	7.56-36	4.18-36	-1.28-35	-7.37-35	-3.24-34	-1.78-33	-2.09-32					
10	1.62-29	1.06-35	1.17-35	9.52-36	-9.81-36	-9.65-35	-6.05-34	-7.39-33						
9	2.30-29	1.55-35	1.92-35	2.05-35	3.98-37	-1.42-34	-2.05-33							
8	3.46-29	2.45-35	3.41-35	4.80-35	4.79-35	-1.76-34								
7	5.58-29	4.22-35	6.89-35	1.41-34	4.92-34									
6	1.00-28	8.29-35	1.77-34	7.79-34										
5	2.14-28	2.08-34	8.25-34											
4	6.41-28	9.68-34												
3	4.65-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.95-35	-2.09-35	-2.17-35	-2.20-35	-2.18-35	-2.08-35	-1.89-35	-1.68-35	-1.38-35	-9.88-36	-4.68-36	2.07-36	1.07-35	2.21-35
45	-3.00-35	-3.27-35	-3.48-35	-3.61-35	-3.67-35	-3.56-35	-3.05-35	-3.24-35	-2.90-35	-2.39-35	-1.65-35	-6.09-36	8.28-36	2.89-35
40	-5.02-35	-5.63-35	-6.16-35	-6.63-35	-7.02-35	-7.15-35	-7.36-35	-7.44-35	-7.34-35	-6.99-35	-6.22-35	-4.83-35	-2.51-35	1.53-35
35	-9.56-35	-1.12-34	-1.28-34	-1.46-34	-1.64-34	-1.81-34	-2.03-34	-2.28-34	-2.57-34	-2.91-34	-3.28-34	-3.68-34	-4.09-34	-4.19-34
30	-2.29-34	-2.82-34	-3.51-34	-4.38-34	-5.52-34	-6.95-34	-9.17-34	-1.26-33	-1.82-33	-2.83-33	-4.91-33	-1.02-32	-2.92-32	-1.79-31
29	-2.77-34	-3.54-34	-4.52-34	-5.80-34	-7.58-34	-9.96-34	-1.39-33	-2.04-33	-3.22-33	-5.72-33	-1.21-32	-3.58-32	-2.38-31	
28	-3.47-34	-4.55-34	-5.96-34	-7.92-34	-1.08-33	-1.49-33	-2.22-33	-3.57-33	-6.43-33	-1.39-32	-4.16-32	-2.76-31		
27	-4.45-34	-5.99-34	-8.12-34	-1.12-33	-1.61-33	-2.38-33	-3.88-33	-7.08-33	-1.55-32	-4.73-32	-3.21-31			
26	-5.83-34	-8.12-34	-1.15-33	-1.67-33	-2.55-33	-4.13-33	-7.63-33	-1.69-32	-5.21-32	-3.59-31				
25	-7.88-34	-1.14-33	-1.69-33	-2.63-33	-4.40-33	-8.07-33	-1.81-32	-5.60-32	-3.91-31					
24	-1.10-33	-1.68-33	-2.66-33	-4.51-33	-8.53-33	-1.90-32	-5.99-32	-4.21-31						
23	-1.61-33	-2.62-33	-4.53-33	-8.70-33	-1.99-32	-6.25-32	-4.82-31							
22	-2.50-33	-4.44-33	-8.68-33	-2.02-32	-6.49-32	-4.59-31								
21	-4.21-33	-8.44-33	-2.00-32	-6.52-32	-4.65-31									
20	-7.86-33	-1.90-32	-6.32-32	-4.60-31										
19	-1.77-32	-6.02-32	-4.47-31											
18	-5.51-32	-4.20-31												
17	-3.76-31													

H TE = 2.00+04 NE = 1.00+09 CASE B NC = 20

TOTAL RC = 1.483-13 4-2 RC = 1.714-14 4-2 EM = 7.005-26 2S RC = 5.144-14 2P RC = 9.687-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.29-04	1.93-04	8.30-05	4.30-05	2.51-05	1.59-05	1.07-05	7.53-06	5.51-06	4.15-06	3.20-06	2.52-06	2.02-06	1.64-06
45	8.64-04	2.65-04	1.14-04	5.90-05	3.44-05	2.18-05	1.47-05	1.03-05	7.55-06	5.69-06	4.39-06	3.46-06	2.77-06	2.25-06
40	1.23-03	3.78-04	1.62-04	8.40-05	4.90-05	3.10-05	2.09-05	1.47-05	1.08-05	8.10-06	6.25-06	4.92-06	3.94-06	3.21-06
35	1.84-03	5.64-04	2.42-04	1.26-04	7.32-05	4.64-05	3.12-05	2.20-05	1.61-05	1.21-05	9.32-06	7.34-06	5.88-06	4.78-06
30	2.93-03	8.97-04	3.86-04	2.00-04	1.16-04	7.37-05	4.95-05	3.49-05	2.55-05	1.92-05	1.48-05	1.16-05	9.31-06	7.57-06
29	3.24-03	9.94-04	4.27-04	2.21-04	1.29-04	8.16-05	5.48-05	3.86-05	2.82-05	2.12-05	1.64-05	1.29-05	1.03-05	8.37-06
28	3.60-03	1.10-03	4.74-04	2.46-04	1.43-04	9.06-05	6.09-05	4.29-05	3.13-05	2.36-05	1.82-05	1.43-05	1.14-05	9.29-06
27	4.02-03	1.23-03	5.29-04	2.74-04	1.60-04	1.01-04	6.80-05	4.78-05	3.49-05	2.63-05	2.02-05	1.59-05	1.27-05	1.04-05
26	4.50-03	1.38-03	5.93-04	3.07-04	1.79-04	1.13-04	7.61-05	5.36-05	3.91-05	2.94-05	2.27-05	1.78-05	1.43-05	1.16-05
25	5.07-03	1.55-03	6.67-04	3.45-04	2.01-04	1.27-04	8.56-05	6.02-05	4.40-05	3.31-05	2.55-05	2.00-05	1.60-05	1.30-05
24	5.73-03	1.76-03	7.54-04	3.90-04	2.27-04	1.44-04	9.67-05	6.81-05	4.97-05	3.73-05	2.87-05	2.26-05	1.81-05	1.46-05
23	6.51-03	2.00-03	8.57-04	4.43-04	2.58-04	1.63-04	1.10-04	7.73-05	5.64-05	4.24-05	3.26-05	2.56-05	2.05-05	1.66-05
22	7.44-03	2.28-03	9.79-04	5.07-04	2.95-04	1.87-04	1.25-04	8.82-05	6.43-05	4.83-05	3.72-05	2.92-05	2.33-05	1.89-05
21	8.56-03	2.62-03	1.13-03	5.82-04	3.39-04	2.14-04	1.44-04	1.01-04	7.39-05	5.54-05	4.26-05	3.34-05	2.67-05	2.16-05
20	9.90-03	3.03-03	1.30-03	6.74-04	3.92-04	2.48-04	1.66-04	1.17-04	8.53-05	6.40-05	4.92-05	3.85-05	3.07-05	2.47-05
19	1.15-02	3.54-03	1.52-03	7.85-04	4.57-04	2.89-04	1.94-04	1.36-04	9.92-05	7.43-05	5.71-05	4.46-05	3.54-05	2.85-05
18	1.36-02	4.15-03	1.78-03	9.21-04	5.36-04	3.39-04	2.27-04	1.60-04	1.16-04	8.69-05	6.66-05	5.20-05	4.11-05	3.28-05
17	1.61-02	4.92-03	2.11-03	1.09-03	6.34-04	4.00-04	2.68-04	1.88-04	1.37-04	1.02-04	7.82-05	6.08-05	4.77-05	3.74-05
16	1.92-02	5.87-03	2.52-03	1.30-03	7.56-04	4.77-04	3.20-04	2.24-04	1.63-04	1.21-04	9.23-05	7.12-05	5.50-05	4.05-05
15	2.31-02	7.07-03	3.03-03	1.57-03	9.10-04	5.74-04	3.84-04	2.69-04	1.95-04	1.45-04	1.09-04	8.28-05	6.01-05	
14	2.81-02	8.60-03	3.69-03	1.90-03	1.40-03	6.96-04	4.65-04	3.24-04	2.34-04	1.73-04	1.28-04	9.14-05		
13	3.45-02	1.06-02	4.52-03	2.33-03	1.35-03	8.51-04	5.67-04	3.94-04	2.82-04	2.04-04	1.43-04			
12	4.28-02	1.31-02	5.60-03	2.88-03	1.67-03	1.05-03	6.95-04	4.80-04	3.38-04	2.30-04				
11	5.36-02	1.64-02	6.99-03	3.60-03	2.08-03	1.30-03	8.56-04	5.81-04	3.84-04					
10	6.80-02	2.08-02	8.86-03	4.55-03	2.62-03	1.62-03	1.05-03	6.71-04						
9	8.88-02	2.70-02	1.15-02	5.89-03	3.36-03	2.05-03	1.25-03							
8	1.21-01	3.68-02	1.56-02	7.93-03	4.45-03	2.56-03								
7	1.76-01	5.31-02	2.24-02	1.12-02	5.91-03									
6	2.76-01	8.21-02	3.40-02	1.60-02										
5	4.84-01	1.38-01	5.35-02											
4	1.00+00	2.52-01												
3	2.62+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.36-06	1.13-06	9.54-07	8.11-07	6.96-07	6.01-07	5.23-07	4.58-07	4.03-07	3.56-07	3.17-07	2.83-07	2.53-07	2.28-07
45	1.86-06	1.55-06	1.31-06	1.11-06	9.53-07	8.23-07	7.16-07	6.27-07	5.51-07	4.88-07	4.33-07	3.86-07	3.46-07	3.11-07
40	2.64-06	2.21-06	1.86-06	1.58-06	1.35-06	1.17-06	1.02-06	8.89-07	7.82-07	6.91-07	6.13-07	5.47-07	4.89-07	4.40-07
35	3.94-06	3.28-06	2.77-06	2.35-06	2.01-06	1.74-06	1.51-06	1.32-06	1.16-06	1.02-06	9.05-07	8.05-07	7.18-07	6.42-07
30	6.23-06	5.19-06	4.37-06	3.71-06	3.17-06	2.73-06	2.37-06	2.06-06	1.80-06	1.58-06	1.39-06	1.21-06	1.05-06	8.53-07
29	6.89-06	5.74-06	4.83-06	4.10-06	3.50-06	3.01-06	2.61-06	2.27-06	1.98-06	1.73-06	1.50-06	1.29-06	1.05-06	
28	7.65-06	6.37-06	5.35-06	4.54-06	3.88-06	3.33-06	2.88-06	2.50-06	2.17-06	1.88-06	1.61-06	1.30-06		
27	8.52-06	7.08-06	5.95-06	5.04-06	4.30-06	3.69-06	3.18-06	2.75-06	2.37-06	2.02-06	1.63-06			
26	9.52-06	7.91-06	6.64-06	5.62-06	4.79-06	4.10-06	3.52-06	3.02-06	2.56-06	2.05-06				
25	1.07-05	8.87-06	7.44-06	6.28-06	5.34-06	4.55-06	3.88-06	3.27-06	2.61-06					
24	1.20-05	9.98-06	8.35-06	7.04-06	5.96-06	5.05-06	4.23-06	3.35-06						
23	1.36-05	1.13-05	9.41-06	7.90-06	6.64-06	5.52-06	4.35-06							
22	1.54-05	1.28-05	1.06-05	8.85-06	7.31-06	5.72-06								
21	1.76-05	1.45-05	1.20-05	9.80-06	7.61-06									
20	2.01-05	1.64-05	1.33-05	1.03-05										
19	2.30-05	1.85-05	1.41-05											
18	2.60-05	1.97-05												
17	2.79-05													

H TE = 2.00+04 NE = 1.00+09 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.37-32	4.09-38	-3.84-39	-1.03-37	-2.98-37	-6.45-37	-1.18-36	-1.84-36	-2.44-36	-2.78-36	-2.79-36	-2.45-36	-1.80-36	-8.37-37
45	1.88-32	5.62-38	-5.52-39	-1.43-37	-4.15-37	-9.04-37	-1.66-36	-2.61-36	-3.50-36	-4.03-36	-4.10-36	-3.69-36	-2.80-36	-1.[illegible]5-36
40	2.68-32	8.02-38	-8.37-39	-2.07-37	-6.05-37	-1.33-36	-2.46-36	-3.91-36	-5.30-36	-6.21-36	-6.44-36	-5.96-36	-4.75-36	-2.80-36
35	4.02-32	1.20-37	-1.36-38	-3.17-37	-9.34-37	-2.07-36	-3.89-36	-6.27-36	-8.66-36	-1.04-35	-1.11-35	-1.07-35	-9.12-36	-6.20-36
30	6.41-32	1.92-37	-2.42-38	-5.24-37	-1.56-36	-3.52-36	-6.74-36	-1.12-35	-1.59-35	-1.98-35	-2.21-35	-2.27-35	-2.12-35	-1.72-35
29	7.10-32	2.13-37	-2.75-38	-5.87-37	-1.75-36	-3.96-36	-7.64-36	-1.27-35	-1.82-35	-2.29-35	-2.60-35	-2.72-35	-2.60-35	-2.18-35
28	7.90-32	2.37-37	-3.15-38	-6.59-37	-1.98-36	-4.49-36	-8.71-36	-1.46-35	-2.11-35	-2.69-35	-3.09-35	-3.29-35	-3.22-35	-2.83-35
27	8.82-32	2.65-37	-3.62-38	-7.44-37	-2.24-36	-5.12-36	-1.00-35	-1.69-35	-2.47-35	-3.18-35	-3.72-35	-4.03-35	-4.07-35	-3.73-35
26	9.90-32	2.98-37	-4.19-38	-8.45-37	-2.56-36	-5.87-36	-1.16-35	-1.97-35	-2.92-35	-3.81-35	-4.54-35	-5.03-35	-5.24-35	-5.03-35
25	1.12-31	3.36-37	-4.87-38	-9.66-37	-2.93-36	-6.79-36	-1.35-35	-2.33-35	-3.49-35	-4.63-35	-5.62-35	-6.40-35	-6.89-35	-6.97-35
24	1.26-31	3.81-37	-5.70-38	-1.11-36	-3.39-36	-7.91-36	-1.59-35	-2.77-35	-4.22-35	-5.70-35	-7.09-35	-8.31-35	-9.31-35	-9.95-35
23	1.44-31	4.34-37	-6.71-38	-1.28-36	-3.95-36	-9.31-36	-1.89-35	-3.35-35	-5.18-35	-7.15-35	-9.13-35	-1.11-34	-1.30-34	-1.48-34
22	1.65-31	4.98-37	-7.95-38	-1.50-36	-4.65-36	-1.11-35	-2.27-35	-4.09-35	-6.46-35	-9.16-35	-1.21-34	-1.52-34	-1.88-34	-2.30-34
21	1.90-31	5.76-37	-9.48-38	-1.76-36	-5.52-36	-1.33-35	-2.77-35	-5.09-35	-8.23-35	-1.20-34	-1.64-34	-2.18-34	-2.86-34	-3.81-34
20	2.21-31	6.71-37	-1.13-37	-2.09-36	-6.61-36	-1.62-35	-3.44-35	-6.45-35	-1.07-34	-1.62-34	-2.32-34	-3.25-34	-4.61-34	-6.81-34
19	2.59-31	7.89-37	-1.35-37	-2.51-36	-8.03-36	-2.00-35	-4.34-35	-8.37-35	-1.44-34	-2.27-34	-3.43-34	-5.18-34	-8.11-34	-1.38-33
18	3.06-31	9.38-37	-1.61-37	-3.03-36	-9.88-36	-2.51-35	-5.59-35	-1.12-34	-2.00-34	-3.33-34	-5.40-34	-8.96-34	-1.61-33	-3.37-33
17	3.65-31	1.13-36	-1.91-37	-3.71-36	-1.23-35	-3.21-35	-7.40-35	-1.54-34	-2.91-34	-5.18-34	-9.21-34	-1.74-33	-3.84-33	-1.15-32
16	4.41-31	1.37-36	-2.20-37	-4.60-36	-1.56-35	-4.20-35	-1.01-34	-2.20-34	-4.46-34	-8.72-34	-1.77-33	-4.08-33	-1.28-32	-8.70-32
15	5.39-31	1.70-36	-2.38-37	-5.74-36	-2.02-35	-5.64-35	-1.42-34	-3.33-34	-7.39-34	-1.64-33	-4.06-33	-1.33-32	-9.43-32	
14	6.70-31	2.16-36	-2.21-37	-7.22-36	-2.65-35	-7.78-35	-2.10-34	-5.39-34	-1.36-33	-3.69-33	-1.29-32	-9.58-32		
13	8.48-31	2.80-36	-1.08-37	-9.08-36	-3.53-35	-1.11-34	-3.28-34	-9.60-34	-2.96-33	-1.14-32	-9.01-32			
12	1.10-30	3.75-36	2.30-37	-1.13-35	-4.75-35	-1.64-34	-5.54-34	-1.99-33	-8.71-33	-7.59-32				
11	1.49-30	5.22-36	1.10-36	-1.35-35	-6.43-35	-2.54-34	-1.05-33	-5.41-33	-5.41-32					
10	1.99-30	7.59-36	3.05-36	-1.49-35	-8.72-35	-4.26-34	-2.56-33	-2.99-32						
9	2.83-30	1.16-35	7.19-36	-1.41-35	-1.22-34	-8.64-34	-1.18-32							
8	4.24-30	1.89-35	1.58-35	-8.63-36	-1.99-34	-3.34-33								
7	6.85-30	3.35-35	3.66-35	1.26-35	-5.90-34									
6	1.23-29	6.87-35	1.03-34	1.45-34										
5	2.63-29	1.82-34	4.79-34											
4	7.88-29	8.59-34												
3	5.71-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.42-37	2.06-36	4.07-36	6.53-36	9.52-36	1.33-35	1.77-35	2.31-35	2.97-35	3.78-35	4.77-35	5.99-35	7.51-35	9.40-35
45	3.89-37	2.78-36	5.83-36	9.65-36	1.40-35	2.06-35	2.81-35	3.75-35	4.95-35	6.47-35	8.42-35	1.09-34	1.42-34	1.85-34
40	-8.34-39	3.76-36	8.73-36	1.52-35	2.37-35	3.50-35	4.97-35	6.89-35	9.48-35	1.30-34	1.78-34	2.44-34	3.39-34	4.76-34
35	-1.73-36	4.73-36	1.38-35	2.65-35	4.41-35	6.97-35	1.05-34	1.57-34	2.34-34	3.51-34	5.35-34	8.34-34	1.35-33	2.32-33
30	-9.73-36	2.52-36	2.20-35	5.29-35	1.02-34	1.86-34	3.25-34	5.73-34	1.05-33	2.03-33	4.38-33	1.12-32	3.98-32	3.15-31
29	-1.37-35	2.61-37	2.35-35	6.19-35	1.26-34	2.40-34	4.43-34	8.32-34	1.65-33	3.62-33	9.41-33	3.35-32	2.66-31	
28	-1.96-35	-3.57-36	2.44-35	7.31-35	1.59-34	3.22-34	6.37-34	1.30-33	2.92-33	7.73-33	2.82-32	2.23-31		
27	-2.83-35	-1.02-35	2.38-35	8.68-35	2.06-34	4.53-34	9.82-34	2.28-33	6.18-33	2.30-32	1.89-31			
26	-4.18-35	-2.19-35	1.91-35	1.02-34	2.75-34	6.74-34	1.67-33	4.69-33	1.79-32	1.48-31				
25	-6.31-35	-4.27-35	6.14-36	1.18-34	3.84-34	1.10-33	3.36-33	1.34-32	1.15-31					
24	-9.87-35	-8.19-35	-2.71-35	1.25-34	5.65-34	2.09-33	9.17-33	8.25-32						
23	-1.61-34	-1.60-34	-1.12-34	8.89-35	8.95-34	5.20-33	5.37-32							
22	-2.79-34	-3.29-34	-3.50-34	-1.66-34	1.51-33	2.53-32								
21	-5.21-34	-7.46-34	-1.13-33	-1.73-33	2.30-33									
20	-1.09-33	-1.97-33	-4.63-33	-2.05-32										
19	-2.74-33	-7.33-33	-4.15-32											
18	-9.65-33	-5.99-32												
17	-7.52-32													

H TE = 2.00+04 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 1.531-13 4-2 RC = 1.742-14 4-2 EM = 7.119-26 2S RC = 4.513-14 2P RC = 1.080-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.19-04	1.90-04	8.17-05	4.23-05	2.47-05	1.56-05	1.05-05	7.41-06	5.42-06	4.08-06	3.15-06	2.48-06	1.99-06	1.62-06
45	8.50-04	2.61-04	1.12-04	5.80-05	3.39-05	2.14-05	1.44-05	1.02-05	7.43-06	5.60-06	4.32-06	3.40-06	2.73-06	2.22-06
40	1.21-03	3.72-04	1.60-04	8.27-05	4.82-05	3.06-05	2.06-05	1.45-05	1.06-05	7.97-06	6.15-06	4.84-06	3.88-06	3.16-06
35	1.81-03	5.55-04	2.39-04	1.24-04	7.21-05	4.56-05	3.07-05	2.16-05	1.58-05	1.19-05	9.17-06	7.22-06	5.79-06	4.71-06
30	2.88-03	8.84-04	3.80-04	1.97-04	1.15-04	7.25-05	4.88-05	3.44-05	2.51-05	1.89-05	1.46-05	1.15-05	9.17-06	7.45-06
29	3.19-03	9.79-04	4.20-04	2.18-04	1.27-04	8.03-05	5.40-05	3.80-05	2.78-05	2.09-05	1.61-05	1.27-05	1.01-05	8.25-06
28	3.55-03	1.09-03	4.67-04	2.42-04	1.41-04	8.93-05	6.00-05	4.23-05	3.09-05	2.32-05	1.79-05	1.41-05	1.13-05	9.15-06
27	3.96-03	1.21-03	5.21-04	2.70-04	1.57-04	9.96-05	6.69-05	4.71-05	3.44-05	2.59-05	1.99-05	1.57-05	1.26-05	1.02-05
26	4.44-03	1.36-03	5.84-04	3.02-04	1.76-04	1.12-04	7.50-05	5.28-05	3.85-05	2.90-05	2.23-05	1.76-05	1.40-05	1.14-05
25	4.99-03	1.53-03	6.58-04	3.40-04	1.98-04	1.26-04	8.44-05	5.94-05	4.33-05	3.26-05	2.51-05	1.97-05	1.58-05	1.28-05
24	5.65-03	1.73-03	7.44-04	3.85-04	2.24-04	1.42-04	9.54-05	6.71-05	4.90-05	3.68-05	2.83-05	2.23-05	1.78-05	1.44-05
23	6.43-03	1.97-03	8.46-04	4.38-04	2.55-04	1.61-04	1.08-04	7.63-05	5.56-05	4.18-05	3.22-05	2.53-05	2.02-05	1.64-05
22	7.35-03	2.25-03	9.67-04	5.00-04	2.92-04	1.84-04	1.24-04	8.71-05	6.36-05	4.77-05	3.67-05	2.88-05	2.30-05	1.86-05
21	8.46-03	2.59-03	1.11-03	5.76-04	3.35-04	2.12-04	1.42-04	1.00-04	7.30-05	5.48-05	4.22-05	3.31-05	2.64-05	2.13-05
20	9.81-03	3.01-03	1.29-03	6.67-04	3.88-04	2.46-04	1.65-04	1.16-04	8.45-05	6.34-05	4.87-05	3.81-05	3.04-05	2.45-05
19	1.15-02	3.51-03	1.51-03	7.79-04	4.53-04	2.87-04	1.92-04	1.35-04	9.84-05	7.38-05	5.66-05	4.43-05	3.52-05	2.82-05
18	1.35-02	4.13-03	1.77-03	9.17-04	5.33-04	3.37-04	2.26-04	1.59-04	1.16-04	8.65-05	6.63-05	5.17-05	4.09-05	3.26-05
17	1.60-02	4.91-03	2.11-03	1.09-03	6.34-04	4.00-04	2.68-04	1.88-04	1.37-04	1.02-04	7.82-05	6.08-05	4.77-05	3.74-05
16	1.93-02	5.90-03	2.53-03	1.31-03	7.60-04	4.80-04	3.21-04	2.25-04	1.63-04	1.22-04	9.28-05	7.16-05	5.52-05	4.07-05
15	2.34-02	7.17-03	3.07-03	1.59-03	9.22-04	5.81-04	3.89-04	2.72-04	1.97-04	1.46-04	1.11-04	8.39-05	6.09-05	
14	2.88-02	8.83-03	3.78-03	1.95-03	1.13-03	7.13-04	4.77-04	3.33-04	2.40-04	1.77-04	1.31-04	9.37-05		
13	3.60-02	1.10-02	4.72-03	2.43-03	1.41-03	8.87-04	5.91-04	4.11-04	2.94-04	2.13-04	1.49-04			
12	4.57-02	1.40-02	5.98-03	3.08-03	1.78-03	1.12-03	7.42-04	5.12-04	3.60-04	2.45-04				
11	5.90-02	1.80-02	7.70-03	3.96-03	2.29-03	1.43-03	9.40-04	6.38-04	4.22-04					
10	7.74-02	2.36-02	1.01-02	5.16-03	2.97-03	1.84-03	1.19-03	7.61-04						
9	1.03-01	3.14-02	1.34-02	6.83-03	3.90-03	2.38-03	1.45-03							
8	1.40-01	4.24-02	1.80-02	9.12-03	5.12-03	2.93-03								
7	1.95-01	5.89-02	2.48-02	1.23-02	6.52-03									
6	2.92-01	8.76-02	3.62-02	1.70-02										
5	4.94-01	1.45-01	5.62-02											
4	1.00+00	2.67-01												
3	2.70+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.33-06	1.11-06	9.39-07	7.98-07	6.85-07	5.92-07	5.15-07	4.50-07	3.96-07	3.51-07	3.12-07	2.78-07	2.49-07	2.24-07
45	1.83-06	1.53-06	1.29-06	1.09-06	9.38-07	8.10-07	7.05-07	6.17-07	5.42-07	4.80-07	4.26-07	3.80-07	3.41-07	3.06-07
40	2.60-06	2.17-06	1.83-06	1.55-06	1.33-06	1.15-06	1.00-06	8.75-07	7.69-07	6.80-07	6.04-07	5.38-07	4.82-07	4.33-07
35	3.80-06	3.23-06	2.72-06	2.31-06	1.98-06	1.71-06	1.49-06	1.30-06	1.14-06	1.01-06	8.91-07	7.93-07	7.07-07	6.32-07
30	6.14-06	5.11-06	4.30-06	3.65-06	3.12-06	2.69-06	2.33-06	2.03-06	1.77-06	1.56-06	1.36-06	1.19-06	1.03-06	8.40-07
29	6.79-06	5.65-06	4.75-06	4.03-06	3.45-06	2.97-06	2.57-06	2.23-06	1.95-06	1.70-06	1.48-06	1.27-06	1.03-06	
28	7.53-06	6.27-06	5.27-06	4.47-06	3.82-06	3.28-06	2.84-06	2.46-06	2.14-06	1.85-06	1.59-06	1.28-06		
27	8.39-06	6.98-06	5.86-06	4.97-06	4.24-06	3.64-06	3.14-06	2.71-06	2.34-06	1.99-06	1.60-06			
26	9.38-06	7.80-06	6.54-06	5.54-06	4.72-06	4.04-06	3.47-06	2.97-06	2.52-06	2.02-06				
25	1.05-05	8.74-06	7.33-06	6.19-06	5.26-06	4.49-06	3.83-06	3.22-06	2.57-06					
24	1.19-05	9.84-06	8.24-06	6.95-06	5.88-06	4.98-06	4.17-06	3.30-06						
23	1.34-05	1.11-05	9.29-06	7.80-06	6.55-06	5.45-06	4.29-06							
22	1.53-05	1.26-05	1.05-05	8.74-06	7.22-06	5.65-06								
21	1.74-05	1.43-05	1.18-05	9.69-06	7.53-06									
20	1.99-05	1.63-05	1.32-05	1.02-05										
19	2.28-05	1.83-05	1.40-05											
18	2.59-05	1.96-05												
17	2.79-05													

H TE = 2.00+04 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.44-33	2.05-38	-1.71-38	-9.02-38	-2.19-37	-3.57-37	-3.73-37	-1.93-37	1.71-37	7.00-37	1.39-36	2.25-36	3.31-36	4.60-36
45	1.98-33	2.81-38	-2.38-38	-1.25-37	-3.06-37	-5.02-37	-5.30-37	-2.85-37	2.24-37	9.72-37	1.96-36	3.22-36	4.78-36	6.72-36
40	2.83-33	4.01-38	-3.45-38	-1.82-37	-4.47-37	-7.39-37	-7.93-37	-4.48-37	2.94-37	1.41-36	2.91-36	4.85-36	7.30-36	1.05-35
35	4.23-33	6.01-38	-5.29-38	-2.79-37	-6.92-37	-1.16-36	-1.27-36	-7.68-37	3.76-37	2.15-36	4.61-36	7.90-36	1.22-35	1.79-35
30	6.75-33	9.58-38	-8.76-38	-4.63-37	-1.16-36	-1.99-36	-2.26-36	-1.50-36	4.05-37	3.51-36	8.03-36	1.44-35	2.32-35	3.56-35
29	7.49-33	1.06-37	-9.81-38	-5.18-37	-1.31-36	-2.25-36	-2.58-36	-1.75-36	3.83-37	3.91-36	9.11-36	1.65-35	2.70-35	4.20-35
28	8.33-33	1.18-37	-1.10-37	-5.83-37	-1.48-36	-2.56-36	-2.96-36	-2.05-36	3.38-37	4.37-36	1.04-35	1.92-35	3.18-35	5.01-35
27	9.30-33	1.32-37	-1.25-37	-6.59-37	-1.68-36	-2.92-36	-3.43-36	-2.44-36	2.59-37	4.89-36	1.20-35	2.24-35	3.78-35	6.06-35
26	1.04-32	1.48-37	-1.42-37	-7.49-37	-1.92-36	-3.37-36	-4.00-36	-2.93-36	1.30-37	5.50-36	1.39-35	2.65-35	4.55-35	7.45-35
25	1.18-32	1.67-37	-1.62-37	-8.57-37	-2.21-36	-3.91-36	-4.71-36	-3.56-36	-7.60-38	6.20-36	1.62-35	3.17-35	5.57-35	9.35-35
24	1.33-32	1.89-37	-1.86-37	-9.88-37	-2.56-36	-4.58-36	-5.61-36	-4.39-36	-4.02-37	7.00-36	1.91-35	3.85-35	6.95-35	1.20-34
23	1.52-32	2.15-37	-2.16-37	-1.15-36	-2.99-36	-5.42-36	-6.76-36	-5.49-36	-9.11-37	7.91-36	2.29-35	4.76-35	8.88-35	1.60-34
22	1.74-32	2.46-37	-2.53-37	-1.34-36	-3.54-36	-6.49-36	-8.26-36	-6.99-36	-1.72-36	8.91-36	2.77-35	6.00-35	1.17-34	2.20-34
21	2.00-32	2.84-37	-2.98-37	-1.59-36	-4.23-36	-7.87-36	-1.02-35	-9.08-36	-3.02-36	9.94-36	3.40-35	7.76-35	1.59-34	3.19-34
20	2.33-32	3.30-37	-3.55-37	-1.90-36	-5.11-36	-9.69-36	-1.30-35	-1.21-35	-5.13-36	1.09-35	4.24-35	1.04-34	2.28-34	4.99-34
19	2.73-32	3.84-37	-4.28-37	-2.30-36	-6.28-36	-1.21-35	-1.67-35	-1.65-35	-8.70-36	1.13-35	5.40-35	1.45-34	3.49-34	8.64-34
18	3.22-32	4.58-37	-5.23-37	-2.82-36	-7.84-36	-1.55-35	-2.22-35	-2.33-35	-1.50-35	1.01-35	7.00-35	2.13-34	5.89-34	1.77-33
17	3.85-32	5.47-37	-6.48-37	-3.52-36	-9.98-36	-2.04-35	-3.04-35	-3.43-35	-2.65-35	4.79-36	9.25-35	3.42-34	1.17-33	4.97-33
16	4.65-32	6.62-37	-8.19-37	-4.48-36	-1.30-35	-2.75-35	-4.12-35	-5.30-35	-4.92-35	-1.24-35	1.22-34	6.23-34	3.11-33	3.02-32
15	5.69-32	8.13-37	-1.05-36	-5.83-36	-1.74-35	-3.85-35	-6.05-35	-8.75-35	-9.82-35	-6.69-35	1.45-34	1.04-33	1.74-32	
14	7.07-32	1.02-36	-1.37-36	-7.78-36	-2.42-35	-5.65-35	-1.03-34	-1.57-34	-2.19-34	-2.63-34	-8.88-36	6.06-33		
13	8.94-32	1.30-36	-1.82-36	-1.07-35	-3.50-35	-8.79-35	-1.77-34	-3.19-34	-5.82-34	-1.22-33	-3.71-33			
12	1.15-31	1.70-36	-2.48-36	-1.53-35	-5.34-35	-1.48-34	-3.44-34	-7.78-34	-2.14-33	-1.17-32				
11	1.53-31	2.33-36	-3.42-36	-2.26-35	-8.70-35	-2.76-34	-7.98-34	-2.64-33	-1.73-32					
10	2.09-31	3.35-36	-4.70-36	-3.50-35	-1.55-34	-6.08-34	-2.54-33	-1.96-32						
9	2.98-31	5.22-36	-6.88-36	-5.64-35	-3.11-34	-1.48-33	-1.12-32							
8	4.47-31	9.01-36	-6.07-36	-9.31-35	-7.67-34	-1.04-32								
7	7.22-31	1.76-35	9.52-37	-1.57-34	-3.32-33									
6	1.30-30	3.94-35	3.66-35	-3.21-34										
5	2.78-30	1.14-34	3.12-34											
4	8.30-30	6.28-34												
3	6.02-29													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.16-36	8.05-36	1.03-35	1.31-35	1.68-35	2.08-35	2.51-35	3.12-35	3.84-35	4.71-35	5.78-35	7.10-35	8.72-35	1.07-34
45	9.11-36	1.20-35	1.57-35	2.01-35	2.57-35	3.25-35	4.11-35	5.17-35	6.51-35	8.20-35	1.03-34	1.31-34	1.67-34	2.14-34
40	1.44-35	1.95-35	2.58-35	3.40-35	4.44-35	5.78-35	7.53-35	9.81-35	1.28-34	1.69-34	2.24-34	3.00-34	4.07-34	5.63-34
35	2.54-35	3.53-35	4.85-35	6.62-35	9.02-35	1.23-34	1.70-34	2.36-34	3.32-34	4.77-34	7.02-34	1.07-33	1.69-33	2.83-33
30	5.30-35	7.79-35	1.16-34	1.68-34	2.49-34	3.77-34	5.88-34	9.51-34	1.63-33	3.00-33	6.20-33	1.54-32	5.28-32	4.06-31
29	6.34-35	9.47-35	1.41-34	2.13-34	3.25-34	5.11-34	8.33-34	1.43-33	2.65-33	5.50-33	1.37-32	4.75-32	3.62-31	
28	7.70-35	1.17-34	1.79-34	2.77-34	4.40-34	7.23-34	1.25-33	2.33-33	4.86-33	1.21-32	4.23-32	3.28-31		
27	9.50-35	1.48-34	2.33-34	3.74-34	6.20-34	1.08-33	2.03-33	4.24-33	1.07-32	3.71-32	2.88-31			
26	1.20-34	1.92-34	3.13-34	5.26-34	9.25-34	1.75-33	3.69-33	9.29-33	3.26-32	2.53-31				
25	1.55-34	2.58-34	4.39-34	7.82-34	1.49-33	3.17-33	8.06-33	2.84-32	2.22-31					
24	2.06-34	3.60-34	6.51-34	1.26-33	2.70-33	6.90-33	2.45-32	1.92-31						
23	2.87-34	5.30-34	1.04-33	2.26-33	5.85-33	2.09-32	1.66-31							
22	4.20-34	8.44-34	1.86-33	4.88-33	1.76-32	1.40-31								
21	6.63-34	1.50-33	3.99-33	1.46-32	1.18-31									
20	1.17-33	3.18-33	1.19-32	9.69-32										
19	2.44-33	9.34-33	7.77-32											
18	7.05-33	6.03-32												
17	4.45-32													

H TE = 3.00+04 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 9.907-14 4-2 RC = 1.087-14 4-2 EM = 4.440-26 2S RC = 3.690-14 2P RC = 6.217-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.60-04	1.39-04	6.03-05	3.15-05	1.86-05	1.19-05	8.04-06	5.70-06	4.19-06	3.18-06	2.46-06	1.95-06	1.57-06	1.28-06
45	6.25-04	1.88-04	8.13-05	4.27-05	2.52-05	1.62-05	1.10-05	7.82-06	5.76-06	4.37-06	3.39-06	2.68-06	2.16-06	1.77-06
40	8.78-04	2.62-04	1.14-04	6.01-05	3.57-05	2.30-05	1.57-05	1.12-05	8.24-06	6.26-06	4.86-06	3.85-06	3.10-06	2.54-06
35	1.28-03	3.84-04	1.68-04	8.95-05	5.34-05	3.46-05	2.35-05	1.68-05	1.24-05	9.42-06	7.32-06	5.80-06	4.67-06	3.82-06
30	1.99-03	6.03-04	2.67-04	1.42-04	8.52-05	5.50-05	3.76-05	2.68-05	1.98-05	1.50-05	1.17-05	9.25-06	7.45-06	6.08-06
29	2.20-03	6.66-04	2.95-04	1.58-04	9.44-05	6.10-05	4.17-05	2.98-05	2.20-05	1.67-05	1.29-05	1.02-05	8.25-06	6.73-06
28	2.44-03	7.39-04	3.28-04	1.75-04	1.05-04	6.78-05	4.64-05	3.31-05	2.44-05	1.85-05	1.44-05	1.14-05	9.16-06	7.48-06
27	2.71-03	8.24-04	3.66-04	1.96-04	1.17-04	7.57-05	5.17-05	3.69-05	2.73-05	2.07-05	1.61-05	1.27-05	1.02-05	8.33-06
26	3.03-03	9.22-04	4.10-04	2.19-04	1.31-04	8.48-05	5.80-05	4.14-05	3.05-05	2.32-05	1.80-05	1.42-05	1.14-05	9.32-06
25	3.40-03	1.04-03	4.62-04	2.47-04	1.48-04	9.55-05	6.53-05	4.66-05	3.44-05	2.61-05	2.02-05	1.60-05	1.29-05	1.05-05
24	3.84-03	1.17-03	5.22-04	2.79-04	1.67-04	1.08-04	7.38-05	5.26-05	3.88-05	2.94-05	2.28-05	1.81-05	1.45-05	1.18-05
23	4.35-03	1.33-03	5.93-04	3.17-04	1.90-04	1.23-04	8.39-05	5.98-05	4.41-05	3.34-05	2.59-05	2.05-05	1.65-05	1.34-05
22	4.97-03	1.52-03	6.78-04	3.63-04	2.17-04	1.40-04	9.58-05	6.83-05	5.04-05	3.82-05	2.96-05	2.34-05	1.88-05	1.52-05
21	5.72-03	1.75-03	7.79-04	4.17-04	2.50-04	1.61-04	1.10-04	7.85-05	5.79-05	4.39-05	3.40-05	2.68-05	2.15-05	1.74-05
20	6.62-03	2.03-03	9.02-04	4.83-04	2.89-04	1.87-04	1.28-04	9.09-05	6.70-05	5.07-05	3.93-05	3.09-05	2.47-05	2.00-05
19	7.72-03	2.36-03	1.05-03	5.63-04	3.37-04	2.18-04	1.49-04	1.06-04	7.80-05	5.90-05	4.56-05	3.59-05	2.87-05	2.31-05
18	9.09-03	2.78-03	1.24-03	6.63-04	3.97-04	2.56-04	1.75-04	1.24-04	9.16-05	6.92-05	5.35-05	4.20-05	3.33-05	2.66-05
17	1.08-02	3.30-03	1.47-03	7.87-04	4.71-04	3.04-04	2.07-04	1.48-04	1.09-04	8.19-05	6.31-05	4.93-05	3.88-05	3.05-05
16	1.30-02	3.96-03	1.76-03	9.44-04	5.64-04	3.64-04	2.48-04	1.77-04	1.30-04	9.77-05	7.49-05	5.81-05	4.49-05	3.30-05
15	1.58-02	4.81-03	2.14-03	1.15-03	6.85-04	4.42-04	3.01-04	2.14-04	1.57-04	1.17-04	8.94-05	6.80-05	4.93-05	
14	1.94-02	5.93-03	2.64-03	1.41-03	8.42-04	5.43-04	3.69-04	2.62-04	1.91-04	1.42-04	1.06-04	7.58-05		
13	2.44-02	7.41-03	3.30-03	1.76-03	1.05-03	6.77-04	4.60-04	3.25-04	2.35-04	1.72-04	1.20-04			
12	3.11-02	9.44-03	4.19-03	2.24-03	1.34-03	8.58-04	5.81-04	4.07-04	2.90-04	1.98-04				
11	4.05-02	1.23-02	5.45-03	2.91-03	1.73-03	1.11-03	7.45-04	5.13-04	3.43-04					
10	5.43-02	1.64-02	7.26-03	3.87-03	2.30-03	1.46-03	9.66-04	6.24-04						
9	7.50-02	2.26-02	9.98-03	5.30-03	3.13-03	1.96-03	1.22-03							
8	1.08-01	3.23-02	1.42-02	7.51-03	4.36-03	2.57-03								
7	1.64-01	4.86-02	2.12-02	1.10-02	6.04-03									
6	2.66-01	7.79-02	3.35-02	1.64-02										
5	4.78-01	1.36-01	5.49-02											
4	1.00+00	2.59-01												
3	2.70+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.06-06	8.85-07	7.48-07	6.38-07	5.48-07	4.78-07	4.13-07	3.62-07	3.19-07	2.83-07	2.52-07	2.25-07	2.02-07	1.82-07
45	1.46-06	1.22-06	1.03-06	8.82-07	7.58-07	6.56-07	5.71-07	5.01-07	4.41-07	3.91-07	3.48-07	3.10-07	2.78-07	2.50-07
40	2.10-06	1.76-06	1.48-06	1.27-06	1.09-06	9.41-07	8.19-07	7.18-07	6.32-07	5.59-07	4.97-07	4.43-07	3.97-07	3.56-07
35	3.16-06	2.64-06	2.23-06	1.90-06	1.63-06	1.41-06	1.23-06	1.07-06	9.42-07	8.31-07	7.37-07	6.55-07	5.84-07	5.22-07
30	5.02-06	4.20-06	3.54-06	3.01-06	2.58-06	2.22-06	1.93-06	1.68-06	1.47-06	1.29-06	1.13-06	9.83-07	8.46-07	6.86-07
29	5.56-06	4.64-06	3.91-06	3.33-06	2.85-06	2.45-06	2.12-06	1.85-06	1.61-06	1.40-06	1.22-06	1.05-06	8.45-07	
28	6.17-06	5.15-06	4.34-06	3.69-06	3.15-06	2.71-06	2.34-06	2.03-06	1.76-06	1.53-06	1.33-06	1.05-06		
27	6.88-06	5.74-06	4.83-06	4.10-06	3.50-06	3.01-06	2.59-06	2.24-06	1.92-06	1.63-06	1.31-06			
26	7.69-06	6.41-06	5.39-06	4.57-06	3.90-06	3.34-06	2.86-06	2.45-06	2.07-06	1.65-06				
25	8.63-06	7.19-06	6.04-06	5.11-06	4.34-06	3.70-06	3.15-06	2.65-06	2.10-06					
24	9.73-06	8.09-06	6.79-06	5.73-06	4.85-06	4.10-06	3.42-06	2.70-06						
23	1.10-05	9.15-06	7.65-06	6.42-06	5.39-06	4.47-06	3.51-06							
22	1.25-05	1.04-05	8.63-06	7.19-06	5.92-06	4.61-06								
21	1.43-05	1.18-05	9.72-06	7.94-06	6.14-06									
20	1.63-05	1.34-05	1.08-05	8.29-06										
19	1.87-05	1.50-05	1.14-05											
18	2.11-05	1.59-05												
17	2.27-05													

H TE = 3.00+04 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	4.08-38	4.99-38	6.92-38	9.82-38	1.42-37	2.09-37	3.12-37	4.68-37	7.04-37	1.05-36	1.55-36	2.26-36	3.25-36
45	0.00+00	5.55-38	6.80-38	9.60-38	1.39-37	2.05-37	3.03-37	4.51-37	6.71-37	9.91-37	1.45-36	2.11-36	3.02-36	4.28-36
40	0.00+00	7.75-38	9.50-38	1.35-37	1.99-37	2.94-37	4.33-37	6.36-37	9.28-37	1.34-36	1.92-36	2.73-36	3.83-36	5.35-36
35	0.00+00	1.13-37	1.37-37	1.95-37	2.85-37	4.16-37	6.03-37	8.65-37	1.23-36	1.73-36	2.41-36	3.33-36	4.58-36	6.26-36
30	0.00+00	1.77-37	2.11-37	2.97-37	4.27-37	6.11-37	8.63-37	1.21-36	1.66-36	2.27-36	3.08-36	4.13-36	5.52-36	7.34-36
29	0.00+00	1.95-37	2.33-37	3.26-37	4.68-37	6.67-37	9.40-37	1.31-36	1.80-36	2.44-36	3.29-36	4.39-36	5.83-36	7.67-36
28	0.00+00	2.16-37	2.58-37	3.60-37	5.16-37	7.34-37	1.03-36	1.43-36	1.96-36	2.65-36	3.55-36	4.72-36	6.21-36	8.09-36
27	0.00+00	2.41-37	2.86-37	4.00-37	5.72-37	8.13-37	1.14-36	1.58-36	2.16-36	2.91-36	3.89-36	5.13-36	6.69-36	8.59-36
26	0.00+00	2.70-37	3.20-37	4.47-37	6.39-37	9.08-37	1.27-36	1.76-36	2.40-36	3.24-36	4.31-36	5.66-36	7.31-36	9.21-36
25	0.00+00	3.04-37	3.60-37	5.03-37	7.19-37	1.02-36	1.43-36	1.99-36	2.71-36	3.66-36	4.86-36	6.35-36	8.11-36	9.97-36
24	0.00+00	3.43-37	4.08-37	5.70-37	8.16-37	1.16-36	1.64-36	2.27-36	3.11-36	4.20-36	5.58-36	7.26-36	9.15-36	1.08-35
23	0.00+00	3.91-37	4.64-37	6.50-37	9.34-37	1.34-36	1.89-36	2.63-36	3.62-36	4.90-36	6.53-36	8.47-36	1.05-35	1.17-35
22	0.00+00	4.48-37	5.33-37	7.48-37	1.08-36	1.55-36	2.20-36	3.09-36	4.28-36	5.84-36	7.81-36	1.01-35	1.21-35	1.22-35
21	0.00+00	5.17-37	6.16-37	8.69-37	1.26-36	1.82-36	2.61-36	3.70-36	5.17-36	7.12-36	9.57-36	1.23-35	1.41-35	1.08-35
20	0.00+00	6.01-37	7.19-37	1.02-36	1.49-36	2.17-36	3.14-36	4.50-36	6.37-36	8.88-36	1.20-35	1.52-35	1.58-35	3.11-36
19	0.00+00	7.09-37	8.47-37	1.21-36	1.78-36	2.62-36	3.84-36	5.59-36	8.05-36	1.14-35	1.55-35	1.91-35	1.51-35	-2.87-35
18	0.00+00	8.35-37	1.01-36	1.45-36	2.15-36	3.22-36	4.80-36	7.12-36	1.05-35	1.51-35	2.06-35	2.33-35	1.91-36	-1.71-34
17	0.00+00	1.00-36	1.21-36	1.76-36	2.65-36	4.03-36	6.13-36	9.32-36	1.41-35	2.08-35	2.81-35	2.37-35	-7.79-35	-1.05-33
16	0.00+00	1.21-36	1.48-36	2.17-36	3.33-36	5.17-36	8.07-36	1.27-35	1.98-35	2.98-35	3.76-35	-9.10-36	-6.53-34	-1.43-32
15	0.00+00	1.49-36	1.84-36	2.74-36	4.28-36	6.82-36	1.10-35	1.80-35	2.93-35	4.47-35	3.81-35	-3.41-34	-1.01-32	
14	0.00+00	1.86-36	2.33-36	3.52-36	5.65-36	9.32-36	1.57-35	2.71-35	4.66-35	6.67-35	-1.12-34	-6.73-33		
13	0.00+00	2.37-36	3.01-36	4.67-36	7.74-36	1.34-35	2.40-35	4.45-35	8.02-35	4.37-35	-4.03-33			
12	0.00+00	3.09-36	4.00-36	6.40-36	1.11-35	2.04-35	4.00-35	8.23-35	1.36-34	-2.00-33				
11	0.00+00	4.15-36	5.51-36	9.18-36	1.70-35	3.43-35	7.67-35	1.79-34	-6.05-34					
10	0.00+00	5.78-36	7.94-36	1.40-35	2.85-35	6.68-35	1.86-34	2.51-34						
9	0.00+00	8.43-36	1.22-35	2.35-35	5.56-35	1.69-34	6.72-34							
8	0.00+00	1.31-35	2.04-35	4.57-35	1.43-34	7.83-34								
7	0.00+00	2.23-35	3.96-35	1.16-34	7.15-34									
6	0.00+00	4.40-35	9.97-35	5.80-34										
5	0.00+00	1.13-34	4.75-34											
4	0.00+00	5.44-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.62-36	6.47-36	8.97-36	1.23-35	1.67-35	2.25-35	3.01-35	4.01-35	5.30-35	6.99-35	9.18-35	1.20-34	1.58-34	2.06-34
45	6.00-36	8.33-36	1.15-35	1.57-35	2.13-35	2.87-35	3.85-35	5.16-35	6.88-35	9.18-35	1.22-34	1.63-34	2.18-34	2.93-34
40	7.40-36	1.02-35	1.39-35	1.89-35	2.57-35	3.48-35	4.72-35	6.38-35	8.66-35	1.18-34	1.61-34	2.21-34	3.07-34	4.32-34
35	8.54-36	1.16-35	1.58-35	2.14-35	2.91-35	3.97-35	5.43-35	7.47-35	1.04-34	1.45-34	2.05-34	2.94-34	4.30-34	6.45-34
30	9.70-36	1.28-35	1.67-35	2.17-35	2.79-35	3.48-35	4.12-35	4.23-35	2.32-35	-6.51-35	-4.02-34	-1.80-33	-9.60-33	-1.06-31
29	1.00-35	1.30-35	1.66-35	2.07-35	2.48-35	2.69-35	2.15-35	-7.39-36	-1.11-34	-4.70-34	-1.89-33	-9.67-33	-1.06-31	
28	1.04-35	1.31-35	1.60-35	1.84-35	1.82-35	9.73-36	-2.31-35	-1.30-34	-4.87-34	-1.87-33	-9.36-33	-1.02-31		
27	1.08-35	1.30-35	1.46-35	1.34-35	4.17-36	-2.85-35	-1.31-34	-4.69-34	-1.77-33	-8.79-33	-9.56-32			
26	1.12-35	1.25-35	1.14-35	2.88-36	-2.68-35	-1.20-34	-4.27-34	-1.61-33	-8.03-33	-8.82-32				
25	1.14-35	1.09-35	4.16-36	-2.07-35	-1.01-34	-3.69-34	-1.41-33	-7.15-33	-7.98-32					
24	1.12-35	6.69-36	-1.25-35	-7.81-35	-3.04-34	-1.20-33	-6.24-33	-7.11-32						
23	9.57-36	-3.90-36	-5.45-35	-2.37-34	-9.91-34	-3.31-33	-6.24-32							
22	4.12-36	-3.22-35	-1.74-34	-7.87-34	-4.42-33	-5.38-32								
21	-1.28-35	-1.17-34	-5.99-34	-3.58-33	-4.57-32									
20	-6.85-35	-4.32-34	-2.82-33	-3.81-32										
19	-2.82-34	-2.14-33	-3.11-32											
18	-1.54-33	-2.48-32												
17	-1.92-32													

H TE = 3.00+04 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 9.909-14 4-2 RC = 1.087-14 4-2 EM = 4.441-26 2S RC = 3.690-14 2P RC = 6.219-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.76-04	1.46-04	6.29-05	3.26-05	1.91-05	1.21-05	8.16-06	5.76-06	4.22-06	3.18-06	2.46-06	1.94-06	1.55-06	1.27-06
45	6.45-04	1.97-04	8.51-05	4.42-05	2.59-05	1.65-05	1.11-05	7.85-06	5.75-06	4.34-06	3.35-06	2.65-06	2.12-06	1.73-06
40	9.06-04	2.76-04	1.19-04	6.21-05	3.64-05	2.32-05	1.57-05	1.11-05	8.15-06	6.16-06	4.77-06	3.77-06	3.03-06	2.47-06
35	1.34-03	4.04-04	1.74-04	9.12-05	5.37-05	3.43-05	2.33-05	1.65-05	1.22-05	9.20-06	7.13-06	5.64-06	4.54-06	3.70-06
30	2.09-03	6.24-04	2.71-04	1.43-04	8.45-05	5.43-05	3.70-05	2.63-05	1.94-05	1.47-05	1.14-05	9.03-06	7.27-06	5.93-06
29	2.31-03	6.87-04	2.99-04	1.57-04	9.35-05	6.01-05	4.09-05	2.92-05	2.15-05	1.63-05	1.27-05	1.00-05	8.06-06	6.58-06
28	2.55-03	7.59-04	3.31-04	1.75-04	1.04-04	6.68-05	4.56-05	3.25-05	2.39-05	1.82-05	1.41-05	1.12-05	8.97-06	7.32-06
27	2.83-03	8.42-04	3.68-04	1.95-04	1.16-04	7.46-05	5.09-05	3.63-05	2.68-05	2.03-05	1.57-05	1.25-05	1.00-05	8.17-06
26	3.15-03	9.39-04	4.11-04	2.18-04	1.30-04	8.37-05	5.71-05	4.07-05	3.00-05	2.28-05	1.77-05	1.40-05	1.12-05	9.16-06
25	3.52-03	1.05-03	4.61-04	2.45-04	1.46-04	9.43-05	6.43-05	4.59-05	3.38-05	2.57-05	1.99-05	1.57-05	1.26-05	1.03-05
24	3.96-03	1.18-03	5.21-04	2.77-04	1.65-04	1.07-04	7.29-05	5.19-05	3.83-05	2.90-05	2.25-05	1.78-05	1.43-05	1.16-05
23	4.47-03	1.34-03	5.92-04	3.15-04	1.88-04	1.21-04	8.30-05	5.91-05	4.36-05	3.30-05	2.56-05	2.02-05	1.62-05	1.32-05
22	5.08-03	1.53-03	6.76-04	3.61-04	2.15-04	1.39-04	9.49-05	6.77-05	4.99-05	3.78-05	2.93-05	2.31-05	1.85-05	1.50-05
21	5.81-03	1.76-03	7.78-04	4.15-04	2.48-04	1.60-04	1.09-04	7.79-05	5.74-05	4.35-05	3.36-05	2.65-05	2.12-05	1.72-05
20	6.70-03	2.03-03	9.01-04	4.81-04	2.88-04	1.86-04	1.27-04	9.02-05	6.64-05	5.03-05	3.89-05	3.06-05	2.45-05	1.98-05
19	7.79-03	2.37-03	1.05-03	5.62-04	3.36-04	2.17-04	1.48-04	1.05-04	7.75-05	5.86-05	4.53-05	3.56-05	2.84-05	2.28-05
18	9.15-03	2.78-03	1.24-03	6.61-04	3.95-04	2.55-04	1.74-04	1.24-04	9.10-05	6.87-05	5.30-05	4.16-05	3.30-05	2.63-05
17	1.08-02	3.30-03	1.47-03	7.85-04	4.69-04	3.03-04	2.06-04	1.47-04	1.08-04	8.13-05	6.25-05	4.88-05	3.84-05	3.01-05
16	1.30-02	3.96-03	1.76-03	9.42-04	5.63-04	3.63-04	2.47-04	1.76-04	1.29-04	9.70-05	7.43-05	5.75-05	4.44-05	3.27-05
15	1.58-02	4.81-03	2.14-03	1.14-03	6.83-04	4.40-04	3.00-04	2.13-04	1.56-04	1.17-04	8.86-05	6.73-05	4.88-05	
14	1.95-02	5.93-03	2.63-03	1.41-03	8.40-04	5.41-04	3.68-04	2.60-04	1.90-04	1.41-04	1.05-04	7.50-05		
13	2.44-02	7.41-03	3.29-03	1.76-03	1.05-03	6.75-04	4.58-04	3.23-04	2.33-04	1.70-04	1.19-04			
12	3.11-02	9.44-03	4.19-03	2.24-03	1.33-03	8.56-04	5.78-04	4.05-04	2.87-04	1.97-04				
11	4.05-02	1.23-02	5.45-03	2.90-03	1.73-03	1.10-03	7.41-04	5.10-04	3.39-04					
10	5.42-02	1.64-02	7.26-03	3.86-03	2.29-03	1.46-03	9.60-04	6.19-04						
9	7.50-02	2.26-02	9.97-03	5.29-03	3.12-03	1.99-03	1.21-03							
8	1.08-01	3.23-02	1.42-02	7.49-03	4.34-03	2.55-03								
7	1.64-01	4.86-02	2.12-02	1.10-02	6.00-03									
6	2.66-01	7.79-02	3.34-02	1.63-02										
5	4.78-01	1.36-01	5.47-02											
4	1.00+00	2.59-01												
3	2.70+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.05-06	8.73-07	7.36-07	6.27-07	5.38-07	4.65-07	4.05-07	3.54-07	3.12-07	2.76-07	2.46-07	2.19-07	1.97-07	1.77-07
45	1.43-06	1.19-06	1.01-06	8.58-07	7.36-07	6.37-07	5.54-07	4.85-07	4.27-07	3.78-07	3.36-07	3.00-07	2.69-07	2.42-07
40	2.04-06	1.70-06	1.44-06	1.22-06	1.05-06	9.09-07	7.91-07	6.93-07	6.10-07	5.39-07	4.79-07	4.28-07	3.83-07	3.44-07
35	3.06-06	2.56-06	2.16-06	1.84-06	1.58-06	1.36-06	1.19-06	1.04-06	9.13-07	8.07-07	7.15-07	6.37-07	5.68-07	5.08-07
30	4.90-06	4.10-06	3.45-06	2.94-06	2.52-06	2.17-06	1.88-06	1.64-06	1.44-06	1.26-06	1.11-06	9.67-07	8.33-07	6.78-07
29	5.43-06	4.54-06	3.83-06	3.25-06	2.79-06	2.40-06	2.08-06	1.81-06	1.58-06	1.38-06	1.20-06	1.03-06	8.35-07	
28	6.05-06	5.05-06	4.25-06	3.61-06	3.09-06	2.66-06	2.30-06	2.00-06	1.73-06	1.50-06	1.28-06	1.04-06		
27	6.75-06	5.63-06	4.74-06	4.02-06	3.44-06	2.95-06	2.55-06	2.20-06	[illegible]	1.61-06	1.30-06			
26	7.56-06	6.30-06	5.30-06	4.49-06	3.83-06	3.28-06	2.82-06	2.41-06	2.08-06	1.63-06				
25	8.50-06	7.08-06	5.95-06	5.03-06	4.28-06	3.65-06	3.11-06	2.61-06	2.08-06					
24	9.59-06	7.98-06	6.69-06	5.64-06	4.78-06	4.04-06	3.38-06	2.67-06						
23	1.09-05	9.02-06	7.54-06	6.33-06	5.32-06	4.42-06	3.47-06							
22	1.24-05	1.02-05	8.52-06	7.10-06	5.85-06	4.56-06								
21	1.41-05	1.16-05	9.60-06	7.85-06	6.08-06									
20	1.61-05	1.32-05	1.07-05	8.22-06										
19	1.85-05	1.48-05	1.13-05											
18	2.09-05	1.58-05												
17	2.24-05													

H TE = 3.00+04 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	4.11-38	4.88-38	6.36-38	8.32-38	1.10-37	1.52-37	2.22-37	3.38-37	5.28-37	8.30-37	1.30-36	1.99-36	3.01-36
45	0.00+00	5.66-38	6.81-38	9.10-38	1.23-37	1.70-37	2.40-37	3.65-37	5.63-37	8.82-37	1.38-36	2.15-36	3.29-36	4.95-36
40	0.00+00	8.07-38	9.85-38	1.35-37	1.89-37	2.71-37	4.00-37	6.07-37	9.39-37	1.47-36	2.28-36	3.51-36	5.36-36	8.05-36
35	0.00+00	1.20-37	1.48-37	2.09-37	3.03-37	4.48-37	6.76-37	1.04-36	1.60-36	2.47-36	3.80-36	5.80-36	8.77-36	1.32-35
30	0.00+00	1.88-37	2.32-37	3.35-37	4.99-37	7.55-37	1.15-36	1.75-36	2.67-36	4.07-36	6.17-36	9.31-36	1.40-35	2.10-35
29	0.00+00	2.07-37	2.56-37	3.70-37	5.53-37	8.37-37	1.27-36	1.94-36	2.94-36	4.46-36	6.74-36	1.01-35	1.52-35	2.29-35
28	0.00+00	2.28-37	2.82-37	4.09-37	6.13-37	9.27-37	1.41-36	2.13-36	3.23-36	4.87-36	7.33-36	1.10-35	1.65-35	2.49-35
27	0.00+00	2.53-37	3.13-37	4.53-37	6.80-37	1.03-36	1.55-36	2.34-36	3.53-36	5.30-36	7.95-36	1.19-35	1.79-35	2.70-35
26	0.00+00	2.82-37	3.48-37	5.04-37	7.55-37	1.14-36	1.71-36	2.58-36	3.86-36	5.77-36	8.62-36	1.29-35	1.94-35	2.93-35
25	0.00+00	3.16-37	3.88-37	5.62-37	8.41-37	1.26-36	1.90-36	2.83-36	4.22-36	6.28-36	9.36-36	1.40-35	2.10-35	3.18-35
24	0.00+00	3.56-37	4.36-37	6.30-37	9.40-37	1.41-36	2.10-36	3.13-36	4.64-36	6.87-36	1.02-35	1.52-35	2.28-35	3.45-35
23	0.00+00	4.03-37	4.92-37	7.10-37	1.06-36	1.58-36	2.35-36	3.47-36	5.13-36	7.57-36	1.12-35	1.66-35	2.49-35	3.76-35
22	0.00+00	4.59-37	5.59-37	8.05-37	1.20-36	1.78-36	2.64-36	3.90-36	5.74-36	8.44-36	1.24-35	1.84-35	2.74-35	4.10-35
21	0.00+00	5.27-37	6.41-37	9.22-37	1.37-36	2.04-36	3.02-36	4.45-36	6.53-36	9.58-36	1.41-35	2.07-35	3.03-35	4.41-35
20	0.00+00	6.11-37	7.41-37	1.07-36	1.59-36	2.36-36	3.50-36	5.17-36	7.60-36	1.11-35	1.63-35	2.36-35	3.36-35	4.45-35
19	0.00+00	7.14-37	8.67-37	1.25-36	1.86-36	2.79-36	4.15-36	6.16-36	9.09-36	1.34-35	1.94-35	2.75-35	3.58-35	3.13-35
18	0.00+00	8.43-37	1.03-36	1.48-36	2.22-36	3.35-36	5.03-36	7.54-36	1.12-35	1.66-35	2.39-35	3.18-35	2.99-35	-4.92-35
17	0.00+00	1.01-36	1.23-36	1.79-36	2.71-36	4.12-36	6.28-36	9.55-36	1.44-35	2.15-35	3.02-35	3.95-35	-2.09-35	-5.82-34
16	0.00+00	1.22-36	1.49-36	2.20-36	3.36-36	5.21-36	8.10-36	1.26-35	1.95-35	2.92-35	3.81-35	1.04-35	-3.99-34	-8.10-33
15	0.00+00	1.49-36	1.85-36	2.75-36	4.29-36	6.80-36	1.09-35	1.75-35	2.79-35	4.16-35	3.81-35	-2.27-34	-6.19-33	
14	0.00+00	1.87-36	2.33-36	3.53-36	5.63-36	9.22-36	1.53-35	2.58-35	4.28-35	5.87-35	-7.96-35	-4.41-33		
13	0.00+00	2.38-36	3.01-36	4.66-36	7.68-36	1.31-35	2.31-35	4.14-35	7.07-35	3.43-35	-2.85-33			
12	0.00+00	3.10-36	4.00-36	6.38-36	1.10-35	1.99-35	3.80-35	7.44-35	1.12-34	-1.54-33				
11	0.00+00	4.16-36	5.50-36	9.14-36	1.67-35	3.32-35	7.14-35	1.55-34	-5.37-34					
10	0.00+00	5.78-36	7.93-36	1.40-35	2.80-35	6.39-35	1.68-34	1.56-34						
9	0.00+00	8.43-36	1.22-35	2.34-35	5.43-35	1.59-34	5.51-34							
8	0.00+00	1.31-35	2.04-35	4.53-35	1.38-34	6.98-34								
7	0.00+00	2.23-35	3.95-35	1.15-34	6.72-34									
6	0.00+00	4.40-35	9.93-35	5.65-34										
5	0.00+00	1.13-34	4.72-34											
4	0.00+00	5.44-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.45-36	6.47-36	9.24-36	1.30-35	1.80-35	2.46-35	3.33-35	4.47-35	5.94-35	7.83-35	1.03-34	1.34-34	1.74-34	2.26-34
45	7.34-36	1.07-35	1.54-35	2.18-35	3.06-35	4.26-35	5.86-35	8.02-35	1.09-34	1.48-34	2.00-34	2.71-34	3.67-34	4.97-34
40	1.20-35	1.75-35	2.54-35	3.65-35	5.20-35	7.36-35	1.04-34	1.46-34	2.06-34	2.91-34	4.12-34	5.88-34	8.48-34	1.24-33
35	1.96-35	2.89-35	4.24-35	6.19-35	9.04-35	1.32-34	1.93-34	2.85-34	4.26-34	6.45-34	9.97-34	1.59-33	2.62-33	4.56-33
30	3.15-35	4.72-35	7.11-35	1.08-34	1.65-34	2.56-34	4.06-34	6.65-34	1.14-33	2.08-33	4.22-33	1.01-32	3.30-32	2.36-31
29	3.44-35	5.19-35	7.88-35	1.21-34	1.87-34	2.97-34	4.85-34	8.26-34	1.50-33	2.99-33	7.01-33	2.23-32	1.54-31	
28	3.76-35	5.70-35	8.74-35	1.36-34	2.15-34	3.49-34	5.90-34	1.06-33	2.08-33	4.75-33	1.46-32	9.53-32		
27	4.09-35	6.26-35	9.70-35	1.53-34	2.48-34	4.16-34	7.36-34	1.41-33	3.13-33	9.07-33	5.44-32			
26	4.46-35	6.88-35	1.08-34	1.73-34	2.88-34	5.02-34	9.40-34	1.99-33	5.31-33	2.67-32				
25	4.87-35	7.57-35	1.20-34	1.97-34	3.36-34	6.07-34	1.20-33	2.77-33	8.72-33					
24	5.31-35	8.31-35	1.33-34	2.20-34	3.77-34	6.69-34	1.11-33	-2.67-33						
23	5.78-35	9.01-35	1.42-34	2.25-34	3.84-34	6.63-35	-9.39-33							
22	6.18-35	9.22-35	1.28-34	1.11-34	-5.42-34	-1.30-32								
21	6.16-35	7.19-35	-4.81-36	-8.42-34	-1.44-32									
20	4.28-35	-5.60-35	-9.28-34	-1.44-32										
19	-6.49-35	-8.80-34	-1.34-32											
18	-7.53-34	-1.19-32												
17	-1.00-32													

1987MNRAS.224..801H

H TE = 3.00+04 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 9.912-14 4-2 RC = 1.087-14 4-2 EM = 4.443-26 2S RC = 3.690-14 2P RC = 6.223-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.00-04	1.54-04	6.60-05	3.42-05	2.00-05	1.27-05	8.52-06	6.00-06	4.39-06	3.31-06	2.55-06	2.01-06	1.61-06	1.31-06
45	6.72-04	2.06-04	8.87-05	4.60-05	2.68-05	1.70-05	1.14-05	8.07-06	5.90-06	4.45-06	3.43-06	2.70-06	2.17-06	1.77-06
40	9.38-04	2.88-04	1.24-04	6.42-05	3.75-05	2.38-05	1.60-05	1.13-05	8.26-06	6.22-06	4.80-06	3.78-06	3.03-06	2.47-06
35	1.38-03	4.22-04	1.81-04	9.42-05	5.51-05	3.49-05	2.36-05	1.66-05	1.22-05	9.17-06	7.09-06	5.59-06	4.48-06	3.65-06
30	2.15-03	6.56-04	2.83-04	1.47-04	8.62-05	5.48-05	3.70-05	2.62-05	1.92-05	1.45-05	1.12-05	8.83-06	7.08-06	5.77-06
29	2.37-03	7.23-04	3.11-04	1.62-04	9.51-05	6.05-05	4.09-05	2.89-05	2.12-05	1.60-05	1.24-05	9.77-06	7.84-06	6.39-06
28	2.63-03	7.99-04	3.44-04	1.79-04	1.05-04	6.71-05	4.53-05	3.21-05	2.35-05	1.78-05	1.38-05	1.09-05	8.71-06	7.10-06
27	2.94-03	8.86-04	3.82-04	1.99-04	1.17-04	7.46-05	5.05-05	3.57-05	2.62-05	1.98-05	1.53-05	1.21-05	9.72-06	7.92-06
26	3.26-03	9.86-04	4.25-04	2.22-04	1.31-04	8.33-05	5.64-05	4.00-05	2.94-05	2.22-05	1.72-05	1.36-05	1.09-05	8.87-06
25	3.66-03	1.10-03	4.76-04	2.49-04	1.46-04	9.35-05	6.34-05	4.50-05	3.30-05	2.50-05	1.93-05	1.53-05	1.23-05	9.98-06
24	4.12-03	1.24-03	5.35-04	2.80-04	1.65-04	1.06-04	7.16-05	5.08-05	3.74-05	2.83-05	2.19-05	1.73-05	1.39-05	1.13-05
23	4.67-03	1.40-03	6.04-04	3.17-04	1.87-04	1.20-04	8.13-05	5.78-05	4.25-05	3.21-05	2.49-05	1.96-05	1.58-05	1.28-05
22	5.32-03	1.58-03	6.86-04	3.60-04	2.13-04	1.37-04	9.30-05	6.61-05	4.86-05	3.68-05	2.85-05	2.25-05	1.80-05	1.46-05
21	6.08-03	1.81-03	7.85-04	4.13-04	2.45-04	1.57-04	1.07-04	7.61-05	5.60-05	4.24-05	3.28-05	2.59-05	2.07-05	1.68-05
20	7.00-03	2.08-03	9.04-04	4.78-04	2.84-04	1.82-04	1.24-04	8.83-05	6.49-05	4.91-05	3.80-05	2.99-05	2.39-05	1.94-05
19	8.11-03	2.41-03	1.05-03	5.57-04	3.31-04	2.13-04	1.45-04	1.03-04	7.59-05	5.74-05	4.43-05	3.48-05	2.73-05	2.24-05
18	9.47-03	2.82-03	1.23-03	6.55-04	3.90-04	2.51-04	1.71-04	1.22-04	8.94-05	6.75-05	5.20-05	4.08-05	3.24-05	2.59-05
17	1.12-02	3.33-03	1.46-03	7.78-04	4.64-04	2.99-04	2.03-04	1.45-04	1.06-04	8.00-05	6.15-05	4.80-05	3.78-05	2.96-05
16	1.33-02	3.98-03	1.76-03	9.35-04	5.58-04	3.59-04	2.44-04	1.73-04	1.27-04	9.55-05	7.31-05	5.66-05	4.38-05	3.22-05
15	1.60-02	4.83-03	2.13-03	1.14-03	6.78-04	4.36-04	2.97-04	2.10-04	1.54-04	1.15-04	8.73-05	6.63-05	4.81-05	
14	1.97-02	5.93-03	2.63-03	1.40-03	8.35-04	5.37-04	3.65-04	2.58-04	1.87-04	1.39-04	1.04-04	7.40-05		
13	2.45-02	7.42-03	3.29-03	1.75-03	1.04-03	6.70-04	4.54-04	3.19-04	2.31-04	1.68-04	1.18-04			
12	3.12-02	9.44-03	4.18-03	2.23-03	1.33-03	8.50-04	5.73-04	4.00-04	2.84-04	1.94-04				
11	4.06-02	1.23-02	5.44-03	2.89-03	1.72-03	1.10-03	7.35-04	5.04-04	3.35-04					
10	5.43-02	1.64-02	7.25-03	3.85-03	2.28-03	1.44-03	9.50-04	6.11-04						
9	7.50-02	2.26-02	9.96-03	5.27-03	3.10-03	1.93-03	1.19-03							
8	1.08-01	3.23-02	1.42-02	7.47-03	4.32-03	2.52-03								
7	1.64-01	4.86-02	2.12-02	1.10-02	5.95-03									
6	2.66-01	7.79-02	3.33-02	1.62-02										
5	4.78-01	1.36-01	5.44-02											
4	1.00+00	2.58-01												
3	2.70+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.08-06	9.04-07	7.62-07	6.48-07	5.56-07	4.81-07	4.18-07	3.66-07	3.22-07	2.85-07	2.53-07	2.26-07	2.03-07	1.82-07
45	1.46-06	1.22-06	1.02-06	8.72-07	7.48-07	6.46-07	5.62-07	4.92-07	4.33-07	3.83-07	3.40-07	3.04-07	2.72-07	2.45-07
40	2.04-06	1.70-06	1.43-06	1.22-06	1.05-06	9.03-07	7.85-07	6.87-07	6.04-07	5.34-07	4.75-07	4.23-07	3.79-07	3.40-07
35	3.01-06	2.51-06	2.12-06	1.80-06	1.54-06	1.33-06	1.16-06	1.01-06	8.89-07	7.85-07	6.96-07	6.19-07	5.53-07	4.94-07
30	4.76-06	3.97-06	3.35-06	2.84-06	2.44-06	2.10-06	1.82-06	1.59-06	1.39-06	1.22-06	1.07-06	9.37-07	8.09-07	6.60-07
29	5.27-06	4.39-06	3.70-06	3.15-06	2.69-06	2.32-06	2.01-06	1.75-06	1.53-06	1.34-06	1.16-06	1.00-06	8.13-07	
28	5.85-06	4.88-06	4.11-06	3.49-06	2.99-06	2.57-06	2.23-06	1.93-06	1.68-06	1.46-06	1.25-06	1.01-06		
27	6.53-06	5.44-06	4.58-06	3.89-06	3.32-06	2.86-06	2.47-06	2.13-06	1.84-06	1.57-06	1.26-06			
26	7.31-06	6.10-06	5.13-06	4.35-06	3.71-06	3.18-06	2.74-06	2.35-06	1.99-06	1.60-06				
25	8.23-06	6.85-06	5.76-06	4.88-06	4.15-06	3.55-06	3.03-06	2.55-06	2.03-06					
24	9.30-06	7.74-06	6.49-06	5.48-06	4.65-06	3.94-06	3.30-06	2.62-06						
23	1.06-05	8.77-06	7.34-06	6.17-06	5.19-06	4.32-06	3.41-06							
22	1.20-05	9.97-06	8.31-06	6.93-06	5.73-06	4.49-06								
21	1.38-05	1.14-05	9.39-06	7.70-06	5.98-06									
20	1.58-05	1.29-05	1.05-05	8.09-06										
19	1.81-05	1.46-05	1.11-05											
18	2.06-05	1.55-05												
17	2.21-05													

H TE = 3.00+04 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	4.04-38	4.55-38	5.30-38	5.60-38	5.02-38	3.24-38	-1.35-40	-5.04-38	-1.22-37	-2.23-37	-3.64-37	-5.70-37	-8.80-37
45	0.00+00	5.59-38	6.46-38	7.94-38	9.32-38	1.04-37	1.14-37	1.28-37	1.53-37	2.02-37	2.88-37	4.23-37	6.19-37	8.75-37
40	0.00+00	8.05-38	9.51-38	1.22-37	1.55-37	1.97-37	2.58-37	3.58-37	5.27-37	8.07-37	1.26-36	1.95-36	2.98-36	4.45-36
35	0.00+00	1.21-37	1.46-37	1.95-37	2.61-37	3.58-37	5.10-37	7.63-37	1.19-36	1.89-36	3.01-36	4.77-36	7.44-36	1.14-35
30	0.00+00	1.94-37	2.39-37	3.30-37	4.66-37	6.76-37	1.02-36	1.59-36	2.54-36	4.11-36	6.66-36	1.07-35	1.71-35	2.71-35
29	0.00+00	2.15-37	2.66-37	3.70-37	5.28-37	7.75-37	1.18-36	1.85-36	2.97-36	4.83-36	7.86-36	1.27-35	2.04-35	3.25-35
28	0.00+00	2.39-37	2.97-37	4.16-37	6.01-37	8.93-37	1.37-36	2.16-36	3.49-36	5.70-36	9.30-36	1.51-35	2.44-35	3.92-35
27	0.00+00	2.67-37	3.32-37	4.70-37	6.87-37	1.03-36	1.60-36	2.54-36	4.12-36	6.74-36	1.10-35	1.80-35	2.93-35	4.76-35
26	0.00+00	2.99-37	3.73-37	5.33-37	7.87-37	1.20-36	1.87-36	2.99-36	4.87-36	7.99-36	1.31-35	2.16-35	3.54-35	5.81-35
25	0.00+00	3.36-37	4.21-37	6.06-37	9.06-37	1.39-36	2.19-36	3.53-36	5.77-36	9.50-36	1.57-35	2.60-35	4.30-35	7.16-35
24	0.00+00	3.79-37	4.76-37	6.92-37	1.04-36	1.62-36	2.57-36	4.17-36	6.84-36	1.13-35	1.88-35	3.13-35	5.25-35	8.88-35
23	0.00+00	4.29-37	5.40-37	7.92-37	1.21-36	1.89-36	3.03-36	4.92-36	8.10-36	1.35-35	2.25-35	3.79-35	6.44-35	1.11-34
22	0.00+00	4.89-37	6.16-37	9.10-37	1.40-36	2.21-36	3.56-36	5.81-36	9.59-36	1.60-35	2.70-35	4.60-35	7.55-35	1.41-34
21	0.00+00	5.60-37	7.06-37	1.05-36	1.63-36	2.59-36	4.18-36	6.84-36	1.13-35	1.90-35	3.24-35	5.60-35	9.91-35	1.81-34
20	0.00+00	6.45-37	8.14-37	1.22-36	1.90-36	3.03-36	4.91-36	8.05-36	1.34-35	2.26-35	3.89-35	6.86-35	1.25-34	2.39-34
19	0.00+00	7.50-37	9.45-37	1.42-36	2.22-36	3.56-36	5.77-36	9.49-36	1.58-35	2.70-35	4.72-35	8.51-35	1.61-34	3.27-34
18	0.00+00	8.79-37	1.11-36	1.66-36	2.62-36	4.20-36	6.82-36	1.12-35	1.89-35	3.26-35	5.80-35	1.08-34	2.14-34	4.71-34
17	0.00+00	1.04-36	1.31-36	1.98-36	3.12-36	5.01-36	8.17-36	1.35-35	2.30-35	4.02-35	7.32-35	1.41-34	2.95-34	6.85-34
16	0.00+00	1.25-36	1.57-36	2.38-36	3.77-36	6.09-36	1.00-35	1.68-35	2.88-35	5.13-35	9.57-35	1.88-34	3.66-34	-5.46-34
15	0.00+00	1.53-36	1.92-36	2.92-36	4.67-36	7.62-36	1.27-35	2.16-35	3.79-35	6.90-35	1.28-34	2.02-34	-1.30-33	
14	0.00+00	1.89-36	2.40-36	3.68-36	5.96-36	9.93-36	1.69-35	2.97-35	5.37-35	9.80-35	1.36-34	-1.40-33		
13	0.00+00	2.40-36	3.07-36	4.78-36	7.93-36	1.36-35	2.42-35	4.45-35	8.34-35	1.25-34	-1.13-33			
12	0.00+00	3.12-36	4.05-36	6.47-36	1.11-35	2.01-35	3.81-35	7.55-35	1.36-34	-6.90-34				
11	0.00+00	4.17-36	5.54-36	9.18-36	1.67-35	3.26-35	6.89-35	1.50-34	-2.14-34					
10	0.00+00	5.80-36	7.95-36	1.39-35	2.73-35	6.14-35	1.55-34	2.00-34						
9	0.00+00	8.44-36	1.22-35	2.32-35	5.79-35	1.49-34	4.86-34							
8	0.00+00	1.31-35	2.04-35	4.47-35	1.32-34	6.22-34								
7	0.00+00	2.23-35	3.94-35	1.13-34	6.23-34									
6	0.00+00	4.40-35	9.88-35	5.45-34										
5	0.00+00	1.13-34	4.07-34											
4	0.00+00	5.44-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.36-36	-2.09-36	-3.22-36	-4.95-36	7.54-36	-1.14-35	-1.71-35	-2.54-35	-3.73-35	-5.44-35	-7.89-35	-1.14-34	-1.64-34	-2.34-34
45	1.18-36	1.48-36	1.72-36	1.75-36	1.36-36	2.15-37	-2.23-36	-6.80-36	-1.48-35	-2.82-35	-5.01-35	-8.53-35	-1.41-34	-2.30-34
40	6.48-36	9.24-36	1.29-35	1.76-35	2.36-35	3.12-35	4.04-35	5.12-35	6.35-35	7.62-35	8.71-35	9.12-35	7.87-35	3.00-35
35	1.72-35	2.56-35	3.76-35	5.47-35	7.90-35	1.14-34	1.64-34	2.37-34	3.44-34	5.03-34	7.44-34	1.12-33	1.71-33	2.71-33
30	4.25-35	6.62-35	1.03-34	1.62-34	2.55-34	4.10-34	6.75-34	1.15-33	2.05-33	3.93-33	8.36-33	2.11-32	7.25-32	5.36-31
29	5.14-35	8.13-35	1.29-34	2.06-34	3.34-34	5.54-34	9.52-34	1.72-33	3.32-33	7.14-33	1.82-32	6.38-32	4.83-31	
28	6.28-35	1.01-34	1.62-34	2.66-34	4.45-34	7.71-34	1.40-33	2.73-33	5.90-33	1.52-32	5.37-32	4.12-31		
27	7.72-35	1.26-34	2.08-34	3.51-34	6.10-34	1.11-33	2.18-33	4.74-33	1.22-32	4.34-32	3.35-31			
26	9.58-35	[illegible]	2.71-34	4.73-34	8.67-34	1.70-33	3.70-33	9.54-33	3.38-32	2.61-31				
25	1.20-34	2.05-34	3.60-34	6.61-34	1.29-33	2.81-33	7.22-33	2.54-32	1.94-31					
24	1.52-34	2.69-34	4.93-34	9.64-34	2.08-33	5.30-33	1.84-32	1.37-31						
23	1.97-34	3.61-34	7.03-34	1.50-33	3.78-33	1.28-32	9.27-32							
22	2.58-34	5.01-34	1.06-33	2.62-33	8.65-33	5.95-32								
21	3.50-34	7.32-34	1.77-33	5.62-33	3.61-32									
20	4.94-34	1.16-33	3.53-33	2.05-32										
19	7.48-34	2.13-33	1.06-32											
18	1.23-33	4.64-33												
17	1.24-33													

H TE = 3.00+04 NE = 1.00+05 CASE B NC = 66

TOTAL RC = 9.919-14 4-2 RC = 1.088-14 4-2 EM = 4.446-26 2S RC = 3.689-14 2P RC = 6.231-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.26-04	1.61-04	6.94-05	3.60-05	2.10-05	1.33-05	8.94-06	6.30-06	4.61-06	3.47-06	2.68-06	2.11-06	1.69-06	1.38-06
45	7.12-04	2.19-04	9.39-05	4.87-05	2.84-05	1.80-05	1.21-05	8.53-06	6.24-06	4.70-06	3.62-06	2.85-06	2.29-06	1.86-06
40	9.94-04	3.05-04	1.31-04	6.79-05	3.96-05	2.51-05	1.69-05	1.19-05	8.70-06	6.55-06	5.05-06	3.98-06	3.19-06	2.60-06
35	1.44-03	4.42-04	1.90-04	9.85-05	5.75-05	3.64-05	2.45-05	1.73-05	1.26-05	9.50-06	7.33-06	5.77-06	4.63-06	3.77-06
30	2.22-03	6.82-04	2.93-04	1.52-04	8.86-05	5.62-05	3.78-05	2.66-05	1.95-05	1.47-05	1.13-05	8.91-06	7.13-06	5.80-06
29	2.45-03	7.50-04	3.23-04	1.67-04	9.76-05	6.19-05	4.16-05	2.93-05	2.15-05	1.62-05	1.25-05	9.81-06	7.86-06	6.39-06
28	2.71-03	8.29-04	3.57-04	1.85-04	1.08-04	6.84-05	4.60-05	3.25-05	2.37-05	1.79-05	1.38-05	1.08-05	8.69-06	7.07-06
27	3.00-03	9.20-04	3.96-04	2.05-04	1.20-04	7.60-05	5.11-05	3.61-05	2.64-05	1.98-05	1.53-05	1.21-05	9.65-06	7.85-06
26	3.35-03	1.03-03	4.41-04	2.29-04	1.34-04	8.47-05	5.70-05	4.02-05	2.94-05	2.21-05	1.71-05	1.34-05	1.08-05	8.75-06
25	3.75-03	1.15-03	4.94-04	2.56-04	1.50-04	9.49-05	6.39-05	4.51-05	3.30-05	2.48-05	1.91-05	1.51-05	1.21-05	9.81-06
24	4.22-03	1.29-03	5.55-04	2.88-04	1.68-04	1.07-04	7.20-05	5.08-05	3.71-05	2.80-05	2.16-05	1.70-05	1.36-05	1.10-05
23	4.78-03	1.46-03	6.28-04	3.26-04	1.91-04	1.21-04	8.15-05	5.75-05	4.21-05	3.17-05	2.45-05	1.92-05	1.54-05	1.25-05
22	5.44-03	1.66-03	7.13-04	3.71-04	2.17-04	1.38-04	9.29-05	6.55-05	4.80-05	3.61-05	2.79-05	2.19-05	1.75-05	1.42-05
21	6.23-03	1.89-03	8.15-04	4.24-04	2.48-04	1.58-04	1.06-04	7.52-05	5.50-05	4.14-05	3.20-05	2.51-05	2.01-05	1.63-05
20	7.19-03	2.18-03	9.38-04	4.88-04	2.86-04	1.82-04	1.23-04	8.68-05	6.35-05	4.79-05	3.69-05	2.90-05	2.32-05	1.87-05
19	8.36-03	2.52-03	1.09-03	5.66-04	3.32-04	2.11-04	1.43-04	1.01-04	7.40-05	5.57-05	4.29-05	3.37-05	2.69-05	2.16-05
18	9.80-03	2.94-03	1.27-03	6.61-04	3.89-04	2.48-04	1.68-04	1.19-04	8.69-05	6.54-05	5.04-05	3.95-05	3.13-05	2.51-05
17	1.16-02	3.46-03	1.49-03	7.81-04	4.60-04	2.94-04	1.99-04	1.41-04	1.03-04	7.75-05	5.95-05	4.65-05	3.67-05	2.88-05
16	1.39-02	4.12-03	1.78-03	9.32-04	5.50-04	3.52-04	2.38-04	1.69-04	1.23-04	9.26-05	7.09-05	5.50-05	4.26-05	3.15-05
15	1.67-02	4.95-03	2.14-03	1.13-03	6.66-04	4.27-04	2.89-04	2.05-04	1.49-04	1.12-04	8.49-05	6.47-05	4.71-05	
14	2.05-02	6.04-03	2.62-03	1.38-03	8.20-04	5.25-04	3.56-04	2.51-04	1.83-04	1.36-04	1.01-04	7.24-05		
13	2.53-02	7.49-03	3.27-03	1.73-03	1.03-03	6.57-04	4.44-04	3.12-04	2.25-04	1.64-04	1.15-04			
12	3.19-02	9.49-03	4.16-03	2.20-03	1.31-03	8.36-04	5.63-04	3.93-04	2.78-04	1.90-04				
11	4.12-02	1.23-02	5.41-03	2.87-03	1.70-03	1.08-03	7.23-04	4.95-04	3.29-04					
10	5.47-02	1.64-02	7.22-03	3.82-03	2.26-03	1.43-03	9.35-04	6.01-04						
9	7.53-02	2.26-02	9.92-03	5.24-03	3.07-03	1.90-03	1.17-03							
8	1.08-01	3.23-02	1.41-02	7.42-03	4.27-03	2.49-03								
7	1.64-01	4.85-02	2.11-02	1.09-02	5.87-03									
6	2.56-01	7.78-02	3.32-02	1.60-02										
5	4.78-01	1.35-01	5.40-02											
4	1.00+00	2.57-01												
3	2.70+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.14-06	9.47-07	7.98-07	6.79-07	5.82-07	5.03-07	4.38-07	3.83-07	3.37-07	2.98-07	2.65-07	2.37-07	2.12-07	1.91-07
45	1.54-06	1.28-06	1.08-06	9.18-07	7.87-07	6.80-07	5.92-07	5.18-07	4.55-07	4.03-07	3.58-07	3.19-07	2.86-07	2.57-07
40	2.14-06	1.79-06	1.50-06	1.28-06	1.10-06	9.47-07	8.23-07	7.20-07	6.33-07	5.60-07	4.97-07	4.43-07	3.97-07	3.56-07
35	3.10-06	2.59-06	2.18-06	1.85-06	1.59-06	1.37-06	1.19-06	1.04-06	9.14-07	8.06-07	7.15-07	6.36-07	5.67-07	5.07-07
30	4.78-06	3.98-06	3.35-06	2.85-06	2.44-06	2.10-06	1.82-06	1.58-06	1.39-06	1.22-06	1.07-06	9.34-07	8.07-07	6.58-07
29	5.26-06	4.39-06	3.69-06	3.13-06	2.68-06	2.31-06	2.00-06	1.74-06	1.52-06	1.32-06	1.15-06	9.93-07	8.07-07	
28	5.82-06	4.85-06	4.08-06	3.46-06	2.96-06	2.54-06	2.20-06	1.91-06	1.66-06	1.44-06	1.23-06	9.97-07		
27	6.46-06	5.38-06	4.52-06	3.83-06	3.27-06	2.81-06	2.42-06	2.10-06	1.81-06	1.54-06	1.24-06			
26	7.20-06	5.99-06	5.04-06	4.26-06	3.64-06	3.12-06	2.68-06	2.30-06	1.95-06	1.56-06				
25	8.07-06	6.71-06	5.63-06	4.76-06	4.05-06	3.46-06	2.95-06	2.49-06	1.99-06					
24	9.08-06	7.54-06	6.32-06	5.34-06	4.52-06	3.83-06	3.21-06	2.55-06						
23	1.03-05	8.52-06	7.13-06	5.99-06	5.04-06	4.20-06	3.31-06							
22	1.17-05	9.67-06	8.05-06	6.72-06	5.56-06	4.36-06								
21	1.33-05	1.10-05	9.10-06	7.46-06	5.81-06									
20	1.53-05	1.25-05	1.02-05	7.86-06										
19	1.75-05	1.41-05	1.08-05											
18	2.00-05	1.51-05												
17	2.16-05													

H TE = 3.00+04 NE = 1.00+05 CASE B NC = 66

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	3.95-38	4.17-38	4.10-38	2.48-38	-2.06-38	-1.14-37	-2.82-37	-5.64-37	-1.02-36	-1.74-36	-2.83-36	-4.45-36	-6.81-36
45	0.00+00	5.46-38	5.88-38	6.07-38	4.46-38	-6.07-39	-1.14-37	-3.12-37	-6.51-37	-1.21-36	-2.10-36	-3.48-36	-5.58-36	-8.68-36
40	0.00+00	7.87-38	8.71-38	9.62-38	8.70-38	4.17-38	-6.42-38	-2.68-37	-6.28-37	-1.24-36	-2.25-36	-3.87-36	-6.41-36	-1.03-35
35	0.00+00	1.19-37	1.37-37	1.64-37	1.79-37	1.69-37	1.14-37	-1.31-38	-2.66-37	-7.38-37	-1.59-36	-3.06-36	-5.54-36	-9.59-36
30	0.00+00	1.93-37	2.30-37	2.96-37	3.72-37	4.58-37	5.63-37	6.96-37	8.60-37	1.03-36	1.12-36	9.76-37	3.33-37	-1.28-36
29	0.00+00	2.15-37	2.57-37	3.35-37	4.30-37	5.48-37	7.05-37	9.26-37	1.23-36	1.63-36	2.08-36	2.49-36	2.67-36	2.28-36
28	0.00+00	2.40-37	2.88-37	3.80-37	4.98-37	6.52-37	8.71-37	1.20-36	1.68-36	2.37-36	3.27-36	4.39-36	5.66-36	6.93-36
27	0.00+00	2.68-37	3.25-37	4.33-37	5.78-37	7.76-37	1.07-36	1.52-36	2.22-36	3.26-36	4.75-36	6.78-36	9.52-36	1.31-35
26	0.00+00	3.02-37	3.68-37	4.96-37	6.72-37	9.23-37	1.31-36	1.92-36	2.89-36	4.38-36	6.61-36	9.88-36	1.46-35	2.16-35
25	0.00+00	3.41-37	4.18-37	5.70-37	7.85-37	1.10-36	1.60-36	2.41-36	3.72-36	5.80-36	9.03-36	1.40-35	2.16-35	3.35-35
24	0.00+00	3.87-37	4.77-37	6.58-37	9.22-37	1.32-36	1.96-36	3.03-36	4.79-36	7.65-36	1.22-35	1.95-35	3.13-35	5.08-35
23	0.00+00	4.41-37	5.48-37	7.65-37	1.09-36	1.60-36	2.42-36	3.82-36	6.18-36	1.01-35	1.66-35	2.73-35	4.55-35	7.72-35
22	0.00+00	5.06-37	6.34-37	8.95-37	1.30-36	1.94-36	3.02-36	4.86-36	8.04-36	1.35-35	2.27-35	3.86-35	6.68-35	1.19-34
21	0.00+00	5.84-37	7.37-37	1.05-36	1.56-36	2.38-36	3.78-36	6.24-36	1.06-35	1.81-35	3.14-35	5.54-35	1.00-34	1.90-34
20	0.00+00	6.79-37	8.62-37	1.25-36	1.89-36	2.95-36	4.80-36	8.10-36	1.40-35	2.47-35	4.43-35	8.14-35	1.56-34	3.18-34
19	0.00+00	7.94-37	1.02-36	1.50-36	2.30-36	3.69-36	6.15-36	1.06-35	1.89-35	3.43-35	6.39-35	1.23-34	2.53-34	5.75-34
18	0.00+00	9.36-37	1.21-36	1.81-36	2.84-36	4.66-36	7.97-36	1.41-35	2.58-35	4.85-35	9.47-35	1.95-34	4.42-34	1.18-33
17	0.00+00	1.11-36	1.44-36	2.20-36	3.54-36	5.95-36	1.04-35	1.90-35	3.59-35	7.04-35	1.46-34	3.29-34	8.62-34	3.03-33
16	0.00+00	1.34-36	1.74-36	2.70-36	4.45-36	7.66-36	1.38-35	2.59-35	5.07-35	1.05-34	2.36-34	6.08-34	2.06-33	1.39-32
15	0.00+00	1.62-36	2.13-36	3.36-36	5.64-36	9.96-36	1.84-35	3.57-35	7.35-35	1.64-34	4.15-34	1.34-33	8.15-33	
14	0.00+00	2.00-36	2.64-36	4.22-36	7.25-36	1.31-35	2.50-35	5.06-35	1.11-34	2.75-34	8.51-34	4.49-33		
13	0.00+00	2.51-36	3.33-36	5.42-36	9.51-36	1.77-35	3.49-35	7.50-35	1.81-34	5.33-34	2.37-33			
12	0.00+00	3.23-36	4.32-36	7.16-36	1.29-35	2.49-35	5.20-35	1.22-34	3.41-34	1.25-33				
11	0.00+00	4.28-36	5.81-36	9.87-36	1.85-35	3.79-35	8.70-35	2.36-34	7.32-34					
10	0.00+00	5.89-36	8.19-36	1.45-35	2.92-35	6.67-35	1.81-34	5.64-34						
9	0.00+00	8.52-36	1.24-35	2.36-35	5.38-35	1.51-34	5.62-34							
8	0.00+00	1.32-35	2.05-35	4.47-35	1.30-34	5.91-34								
7	0.00+00	2.24-35	3.94-35	1.11-34	5.81-34									
6	0.00+00	4.41-35	9.82-35	5.22-34										
5	0.00+00	1.13-34	4.60-34											
4	0.00+00	5.43-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.01-35	-1.48-35	-2.13-35	-3.01-35	-4.21-35	-5.83-35	-8.01-35	-1.09-34	-1.48-34	-1.99-34	-2.66-34	-3.54-34	-4.69-34	-6.17-34
45	-1.32-35	-1.96-35	-2.87-35	-4.14-35	-5.93-35	-8.41-35	-1.19-34	-1.66-34	-2.32-34	-3.23-34	-4.49-34	-6.21-34	-8.57-34	-1.18-33
40	-1.61-35	-2.47-35	-3.73-35	-5.58-35	-8.27-35	-1.22-34	-1.80-34	-2.64-34	-3.88-34	-5.71-34	-8.42-34	-1.25-33	-1.86-33	-2.79-33
35	-1.60-35	-2.62-35	-4.21-35	-6.71-35	-1.07-34	-1.69-34	-2.70-34	-4.33-34	-7.02-34	-1.16-33	-1.94-33	-3.32-33	-5.90-33	-1.10-32
30	-4.64-36	-1.12-35	-2.37-35	-4.73-35	-9.27-35	-1.81-34	-3.59-34	-7.31-34	-1.55-33	-3.51-33	-8.80-33	-2.61-32	-1.07-31	-9.57-31
29	6.86-37	-3.32-36	-1.22-35	-3.14-35	-7.21-35	-1.60-34	-3.54-34	-8.05-34	-1.93-33	-5.08-33	-1.58-32	-6.73-32	-6.29-31	
28	7.90-36	7.80-36	4.76-36	-5.85-36	-3.53-35	-1.12-34	-3.12-34	-8.56-34	-2.49-33	-8.36-33	-3.80-32	-3.77-31		
27	1.78-35	2.38-35	3.06-35	3.59-35	3.14-35	-9.36-36	-1.75-34	-7.90-34	-3.33-33	-1.76-32	-1.95-31			
26	3.19-35	4.76-35	7.13-35	1.07-34	1.58-34	2.21-34	2.38-34	-1.76-31	-4.24-33	-7.67-32				
25	5.26-35	8.43-35	1.39-34	2.36-34	4.20-34	7.90-34	1.62-33	3.73-33	.91-33					
24	8.43-35	1.44-34	2.59-34	4.93-34	1.03-33	2.48-33	7.88-33	5.02-32						
23	1.35-34	2.49-34	4.90-34	1.07-33	2.73-33	9.47-33	6.95-32							
22	2.23-34	4.47-34	9.95-34	2.62-33	9.45-33	7.32-32								
21	3.85-34	8.67-34	2.32-33	8.51-33	6.75-32									
20	7.20-34	1.94-33	7.14-33	5.69-32										
19	1.54-33	5.65-33	4.45-32											
18	4.24-33	2.25-32												
17	2.20-32													

H TE = 3.00+04 NE = 1.00+06 CASE B NC = 42

TOTAL RC = 9.933-14 4-2 RC = 1.089-14 4-2 EM = 4.449-26 2S RC = 3.686-14 2P RC = 6.247-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.36-0'	1.64-04	7.07-05	3.66-05	2.14-05	1.35-05	9.10-06	6.42-06	4.69-06	3.53-06	2.73-06	2.15-06	1.72-06	1.40-06
45	7.33-04	2.25-04	9.66-05	5.01-05	2.92-05	1.85-05	1.24-05	8.77-06	6.41-06	4.83-06	3.72-06	2.93-06	2.35-06	1.91-06
40	1.04-03	3.18-04	1.37-04	7.08-05	4.13-05	2.61-05	1.76-05	1.24-05	9.06-06	6.82-06	5.26-06	4.14-06	3.32-06	2.70-06
35	1.53-03	4.68-04	2.01-04	1.04-04	6.08-05	3.85-05	2.58-05	1.82-05	1.33-05	1.00-05	7.74-06	6.09-06	4.88-06	3.97-06
30	2.36-03	7.25-04	3.12-04	1.61-04	9.41-05	5.96-05	4.01-05	2.82-05	2.06-05	1.55-05	1.20-05	9.42-06	7.54-06	6.13-06
29	2.60-03	7.97-04	3.43-04	1.77-04	1.03-04	6.55-05	4.40-05	3.10-05	2.27-05	1.71-05	1.31-05	1.03-05	8.28-06	6.73-06
28	2.87-03	8.79-04	3.78-04	1.96-04	1.14-04	7.22-05	4.86-05	3.42-05	2.50-05	1.88-05	1.45-05	1.14-05	9.13-06	7.42-06
27	3.17-03	9.72-04	4.18-04	2.16-04	1.26-04	7.99-05	5.37-05	3.78-05	2.76-05	2.08-05	1.60-05	1.26-05	1.01-05	8.19-06
26	3.52-03	1.08-03	4.64-04	2.40-04	1.40-04	8.86-05	5.96-05	4.20-05	3.07-05	2.31-05	1.78-05	1.40-05	1.12-05	9.09-06
25	3.92-03	1.20-03	5.17-04	2.68-04	1.56-04	9.88-05	6.64-05	4.68-05	3.42-05	2.57-05	1.98-05	1.56-05	1.25-05	1.01-05
24	4.40-03	1.35-03	5.79-04	3.00-04	1.75-04	1.11-04	7.44-05	5.24-05	3.83-05	2.88-05	2.22-05	1.74-05	1.39-05	1.13-05
23	4.95-03	1.52-03	6.52-04	3.38-04	1.97-04	1.25-04	8.38-05	5.90-05	4.31-05	3.24-05	2.49-05	1.96-05	1.57-05	1.27-05
22	5.61-03	1.72-03	7.39-04	3.83-04	2.23-04	1.41-04	9.49-05	6.68-05	4.88-05	3.67-05	2.82-05	2.22-05	1.77-05	1.43-05
21	6.41-03	1.96-03	8.43-04	4.37-04	2.55-04	1.61-04	1.08-04	7.62-05	5.56-05	4.18-05	3.22-05	2.52-05	2.01-05	1.63-05
20	7.37-03	2.26-03	9.69-04	5.02-04	2.93-04	1.85-04	1.24-04	8.76-05	6.39-05	4.80-05	3.69-05	2.89-05	2.31-05	1.86-05
19	8.54-03	2.61-03	1.12-03	5.81-04	3.39-04	2.15-04	1.44-04	1.01-04	7.40-05	5.56-05	4.27-05	3.34-05	2.66-05	2.14-05
18	9.99-03	3.05-03	1.31-03	6.79-04	3.96-04	2.51-04	1.69-04	1.19-04	8.64-05	6.48-05	4.98-05	3.89-05	3.08-05	2.46-05
17	1.18-02	3.60-03	1.55-03	8.01-04	4.67-04	2.96-04	1.99-04	1.40-04	1.02-04	7.63-05	5.85-05	4.55-05	3.58-05	2.81-05
16	1.41-02	4.29-03	1.84-03	9.54-04	5.57-04	3.53-04	2.37-04	1.67-04	1.21-04	9.07-05	6.92-05	5.35-05	4.14-05	3.06-05
15	1.70-02	5.16-03	2.22-03	1.15-03	6.71-04	4.25-04	2.86-04	2.01-04	1.46-04	1.09-04	8.25-05	6.27-05	4.57-05	
14	2.09-02	6.30-03	2.70-03	1.40-03	8.20-04	5.20-04	3.49-04	2.45-04	1.78-04	1.32-04	9.81-05	7.02-05		
13	2.61-02	7.79-03	3.34-03	1.74-03	1.02-03	6.45-04	4.33-04	3.03-04	2.18-04	1.59-04	1.12-04			
12	3.31-02	9.80-03	4.21-03	2.19-03	1.28-03	8.15-04	5.46-04	3.80-04	2.69-04	1.85-04				
11	4.29-02	1.26-02	5.42-03	2.83-03	1.66-03	1.05-03	7.01-04	4.80-04	3.20-04					
10	5.68-02	1.66-02	7.17-03	3.75-03	2.20-03	1.39-03	9.09-04	5.85-04						
9	7.74-02	2.27-02	9.83-03	5.15-03	3.00-03	1.86-03	1.14-03							
8	1.10-01	3.23-02	1.40-02	7.30-03	4.19-03	2.43-03								
7	1.65-01	4.84-02	2.09-02	1.07-02	5.76-03									
6	2.67-01	7.75-02	3.29-02	1.58-02										
5	4.78-01	1.35-01	5.33-02											
4	1.00+00	2.55-01												
3	2.69+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.16-06	9.64-07	8.12-07	6.91-07	5.93-07	5.12-07	4.45-07	3.89-07	3.43-07	3.03-07	2.70-07	2.41-07	2.16-07	1.94-07
45	1.58-06	1.32-06	1.11-06	9.43-07	8.09-07	6.99-07	6.08-07	5.32-07	4.68-07	4.14-07	3.68-07	3.28-07	2.94-07	2.64-07
40	2.23-06	1.86-06	1.56-06	1.33-06	1.14-06	9.85-07	8.56-07	7.49-07	6.58-07	5.82-07	5.17-07	4.61-07	4.12-07	3.70-07
35	3.27-06	2.73-06	2.30-06	1.95-06	1.67-06	1.44-06	1.25-06	1.10-06	9.62-07	8.49-07	7.52-07	6.69-07	5.97-07	5.34-07
30	5.05-06	4.21-06	3.54-06	3.00-06	2.57-06	2.21-06	1.92-06	1.67-06	1.46-06	1.28-06	1.12-06	9.83-07	8.49-07	6.93-07
29	5.56-06	4.62-06	3.88-06	3.29-06	2.82-06	2.42-06	2.10-06	1.82-06	1.59-06	1.39-06	1.21-06	1.04-06	8.47-07	
28	6.11-06	5.08-06	4.27-06	3.62-06	3.10-06	2.66-06	2.30-06	2.00-06	1.73-06	1.50-06	1.29-06	1.04-06		
27	6.74-06	5.61-06	4.71-06	4.00-06	3.41-06	2.93-06	2.52-06	2.18-06	1.88-06	1.60-06	1.29-06			
26	7.47-06	6.22-06	5.22-06	4.42-06	3.76-06	3.22-06	2.77-06	2.38-06	2.01-06	1.62-06				
25	8.31-06	6.91-06	5.79-06	4.90-06	4.16-06	3.55-06	3.03-06	2.55-06	2.04-06					
24	9.29-06	7.71-06	6.46-06	5.44-06	4.61-06	3.90-06	3.27-06	2.60-06						
23	1.04-05	8.64-06	7.22-06	6.06-06	5.10-06	4.24-06	3.35-06							
22	1.18-05	9.72-06	8.09-06	6.75-06	5.57-06	4.37-06								
21	1.33-05	1.10-05	9.07-06	7.43-06	5.78-06									
20	1.52-05	1.24-05	1.01-05	7.77-06										
19	1.73-05	1.39-05	1.06-05											
18	1.95-05	1.48-05												
17	2.10-05													

H TE = 3.00+04 NE = 1.00+06 CASE B NC = 42

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	3.91-38	3.99-38	3.48-38	6.94-39	-6.61-38	-2.19-37	-5.01-37	-9.78-37	-1.73-36	-2.86-36	-4.48-36	-6.78-36	-9.98-36
45	0.00+00	5.38-38	5.53-38	4.90-38	1.18-38	-8.72-38	-2.97-37	-6.88-37	-1.36-36	-2.42-36	-4.04-36	-6.41-36	-9.81-36	-1.46-35
40	0.00+00	7.72-38	8.02-38	7.34-38	2.45-38	-1.10-37	-4.01-37	-9.55-37	-1.92-36	-3.47-36	-5.88-36	-9.47-36	-1.47-35	-2.24-35
35	0.00+00	1.16-37	1.24-37	1.20-37	5.89-38	-1.22-37	-5.26-37	-1.32-36	-2.73-36	-5.08-36	-8.80-36	-1.45-35	-2.32-35	-3.63-35
30	0.00+00	1.88-37	2.07-37	2.21-37	1.65-37	-4.70-38	-5.67-37	-1.65-36	-3.66-36	-7.17-36	-1.30-35	-2.24-35	-3.74-35	-6.15-35
29	0.00+00	2.10-37	2.33-37	2.54-37	2.05-37	-4.30-39	-5.38-37	-1.67-36	-3.81-36	-7.57-36	-1.39-35	-2.42-35	-4.10-35	-6.85-35
28	0.00+00	2.34-37	2.63-37	2.94-37	2.56-37	5.47-38	-4.83-37	-1.65-36	-3.90-36	-7.92-36	-1.48-35	-2.61-35	-4.49-35	-7.62-35
27	0.00+00	2.63-37	2.98-37	3.42-37	3.20-37	1.34-37	-3.97-37	-1.59-36	-3.94-36	-8.19-36	-1.55-35	-2.80-35	-4.89-35	-8.48-35
26	0.00+00	2.96-37	3.40-37	4.00-37	4.00-37	2.40-37	-2.70-37	-1.46-36	-3.88-36	-8.35-36	-1.62-35	-2.97-35	-5.31-35	-9.41-35
25	0.00+00	3.35-37	3.90-37	4.70-37	5.00-37	3.77-37	-9.20-38	-1.26-36	-3.71-36	-8.34-36	-1.67-35	-3.13-35	-5.73-35	-1.04-34
24	0.00+00	3.82-37	4.49-37	5.56-37	6.24-37	5.53-37	1.48-37	-9.61-37	-3.39-36	-8.13-36	-1.69-35	-3.26-35	-6.14-35	-1.16-34
23	0.00+00	4.37-37	5.21-37	6.60-37	7.76-37	7.77-37	4.64-37	-5.43-37	-2.89-36	-7.67-36	-1.67-35	-3.35-35	-6.55-35	-1.29-34
22	0.00+00	5.03-37	6.07-37	7.86-37	9.65-37	1.06-36	8.73-37	2.29-38	-2.17-36	-6.87-36	-1.61-35	-3.39-35	-6.94-35	-1.44-34
21	0.00+00	5.83-37	7.11-37	9.41-37	1.20-36	1.41-36	1.40-36	7.81-37	-1.15-36	-5.62-36	-1.48-35	-3.35-35	-7.28-35	-1.62-34
20	0.00+00	6.81-37	8.40-37	1.13-36	1.50-36	1.87-36	2.10-36	1.81-36	3.09-37	-3.67-36	-1.25-35	-3.15-35	-7.48-35	-1.84-34
19	0.00+00	8.01-37	1.00-36	1.38-36	1.88-36	2.47-36	3.04-36	3.27-36	2.49-36	-4.76-37	-7.98-36	-2.58-35	-7.12-35	-2.05-34
18	0.00+00	9.51-37	1.20-36	1.69-36	2.37-36	3.28-36	4.37-36	5.42-36	5.95-36	5.10-36	1.21-36	-1.04-35	-4.73-35	-1.98-34
17	0.00+00	1.14-36	1.46-36	2.09-36	3.04-36	4.41-36	6.31-36	8.76-36	1.18-35	1.56-35	2.15-35	3.33-35	5.98-35	1.05-34
16	0.00+00	1.38-36	1.79-36	2.64-36	3.97-36	6.05-36	9.27-36	1.43-35	2.23-35	3.72-35	7.16-35	1.75-34	6.20-34	4.73-33
15	0.00+00	1.70-36	2.24-36	3.37-36	5.28-36	8.50-36	1.40-35	2.38-35	4.29-35	8.67-35	2.17-34	7.90-34	6.44-33	
14	0.00+00	2.12-36	2.83-36	4.40-36	7.20-36	1.23-35	2.21-35	4.19-35	8.76-35	2.20-34	7.87-34	6.27-33		
13	0.00+00	2.68-36	3.65-36	5.87-36	1.01-35	1.86-35	3.66-35	7.90-35	2.00-34	6.97-34	5.22-33			
12	0.00+00	3.46-36	4.80-36	8.04-36	1.48-35	2.95-35	6.50-35	1.66-34	5.64-34	3.88-33				
11	0.00+00	4.57-36	6.48-36	1.14-35	2.25-35	4.96-35	1.27-34	4.21-34	2.62-33					
10	0.00+00	6.24-36	9.08-36	1.69-35	3.63-35	9.16-35	2.97-34	1.67-33						
9	0.00+00	8.90-36	1.34-35	2.69-35	6.53-35	2.05-34	1.08-33							
8	0.00+00	1.36-35	2.17-35	4.87-35	1.48-34	7.66-34								
7	0.00+00	2.28-35	4.06-35	1.15-34	3.05-34									
6	0.00+00	4.44-35	9.90-35	5.12-34										
5	0.00+00	1.13-34	4.54-34											
4	0.00+00	5.43-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.44-35	-2.03-35	-2.82-35	-3.85-35	-5.18-35	-6.85-35	-8.91-35	-1.14-34	-1.44-34	-1.79-34	-2.20-34	-2.67-34	-3.23-34	-3.89-34
45	-2.13-35	-3.06-35	-4.32-35	-6.02-35	-8.26-35	-1.12-34	-1.49-34	-1.95-34	-2.53-34	-3.25-34	-4.12-34	-5.21-34	-6.55-34	-8.20-34
40	-3.34-35	-4.90-35	-7.10-35	-1.02-34	-1.44-34	-2.01-34	-2.78-34	-3.81-34	-5.16-34	-6.95-34	-9.33-34	-1.25-33	-1.69-33	-2.31-33
35	-5.60-35	-8.53-35	-1.29-34	-1.93-34	-2.88-34	-4.26-34	-6.28-34	-9.25-34	-1.36-33	-2.02-33	-3.03-33	-4.66-33	-7.39-33	-1.23-32
30	-1.00-34	-1.63-34	-2.66-34	-4.35-34	-7.17-34	-1.20-33	-2.03-33	-3.53-33	-6.39-33	-1.23-32	-2.63-32	-6.65-32	-2.32-31	-1.78-30
29	-1.14-34	-1.89-34	-3.14-34	-5.28-34	-9.00-34	-1.56-33	-2.78-33	-5.15-33	-1.02-32	-2.21-32	-5.69-32	-2.02-31	-1.57-30	
28	-1.29-34	-2.19-34	-3.75-34	-6.52-34	-1.16-33	-2.11-33	-4.00-33	-8.08-33	-1.80-32	-4.73-32	-1.71-31	-1.35-30		
27	-1.47-34	-2.56-34	-4.53-34	-8.20-34	-1.53-33	-2.97-33	-6.16-33	-1.41-32	-3.78-32	-1.40-31	-1.13-30			
26	-1.67-34	-3.02-34	-5.57-34	-1.06-33	-2.11-33	-4.48-33	-1.05-32	-2.90-32	-1.10-31	-9.04-31				
25	-1.92-34	-3.61-34	-7.00-34	-1.42-33	-3.09-33	-7.44-33	-2.11-32	-8.21-32	-6.96-31					
24	-2.22-34	-4.38-34	-9.09-34	-2.02-33	-4.98-33	-1.45-32	-5.82-32	-5.08-31						
23	-2.59-34	-5.48-34	-1.24-33	-3.13-33	-9.39-33	-3.87-32	-3.49-31							
22	-3.10-34	-7.16-34	-1.84-33	-5.66-33	-2.40-32	-2.23-31								
21	-3.83-34	-1.01-33	-3.16-33	-1.38-32	-1.32-31									
20	-4.97-34	-1.60-33	-7.19-33	-7.13-32										
19	-6.94-34	-3.25-33	-3.36-32											
18	-1.04-33	-1.20-32												
17	-5.44-34													

H TE = 3.00+04 NE = 1.00+07 CASE B NC = 26

TOTAL RC = 9.958-14 4-2 RC = 1.091-14 4-2 EM = 4.458-26 2S RC = 3.682-14 2P RC = 6.276-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.37-04	1.65-04	7.08-05	3.67-05	2.14-05	1.36-05	9.12-06	6.43-06	4.70-06	3.54-06	2.73-06	2.15-06	1.72-06	1.40-06
45	7.37-04	2.26-04	9.71-05	5.03-05	2.93-05	1.86-05	1.25-05	8.81-06	6.44-06	4.85-06	3.74-06	2.95-06	2.36-06	1.92-06
40	1.05-03	3.21-04	1.38-04	7.15-05	4.17-05	2.64-05	1.78-05	1.25-05	9.16-06	6.89-06	5.32-06	4.19-06	3.36-06	2.73-06
35	1.56-03	4.79-04	2.06-04	1.06-04	6.21-05	3.93-05	2.65-05	1.86-05	1.36-05	1.02-05	7.90-06	6.22-06	4.99-06	4.06-06
30	2.46-03	7.55-04	3.24-04	1.68-04	9.79-05	6.20-05	4.17-05	2.94-05	2.14-05	1.61-05	1.24-05	9.79-06	7.84-06	6.37-06
29	2.72-03	8.34-04	3.58-04	1.85-04	1.08-04	6.84-05	4.60-05	3.24-05	2.37-05	1.78-05	1.37-05	1.08-05	8.65-06	7.03-06
28	3.01-03	9.24-04	3.97-04	2.05-04	1.20-04	7.58-05	5.10-05	3.59-05	2.62-05	1.97-05	1.52-05	1.20-05	9.57-06	7.77-06
27	3.35-03	1.03-03	4.41-04	2.28-04	1.33-04	8.42-05	5.66-05	3.99-05	2.91-05	2.19-05	1.69-05	1.33-05	1.06-05	8.63-06
26	3.73-03	1.14-03	4.91-04	2.54-04	1.48-04	9.38-05	6.31-05	4.44-05	3.24-05	2.44-05	1.88-05	1.48-05	1.18-05	9.60-06
25	4.17-03	1.28-03	5.50-04	2.85-04	1.66-04	1.05-04	7.06-05	4.97-05	3.63-05	2.73-05	2.10-05	1.65-05	1.32-05	1.07-05
24	4.69-03	1.44-03	6.17-04	3.20-04	1.86-04	1.18-04	7.92-05	5.57-05	4.07-05	3.06-05	2.36-05	1.85-05	1.48-05	1.20-05
23	5.29-03	1.62-03	6.96-04	3.60-04	2.10-04	1.33-04	8.93-05	6.28-05	4.58-05	3.44-05	2.65-05	2.08-05	1.66-05	1.35-05
22	5.99-03	1.84-03	7.89-04	4.08-04	2.38-04	1.50-04	1.01-04	7.11-05	5.19-05	3.90-05	3.00-05	2.35-05	1.88-05	1.52-05
21	6.82-03	2.09-03	8.97-04	4.64-04	2.70-04	1.71-04	1.15-04	8.08-05	5.89-05	4.43-05	3.40-05	2.67-05	2.13-05	1.72-05
20	7.80-03	2.39-03	1.03-03	5.31-04	3.09-04	1.96-04	1.31-04	9.24-05	6.74-05	5.05-05	3.88-05	3.04-05	2.41-05	1.96-05
19	8.99-03	2.75-03	1.18-03	6.12-04	3.56-04	2.25-04	1.51-04	1.06-04	7.74-05	5.81-05	4.46-05	3.49-05	2.77-05	2.23-05
18	1.04-02	3.20-03	1.37-03	7.10-04	4.13-04	2.61-04	1.75-04	1.23-04	8.96-05	6.72-05	5.15-05	4.02-05	3.18-05	2.54-05
17	1.22-02	3.75-03	1.61-03	8.31-04	4.84-04	3.06-04	2.05-04	1.44-04	1.05-04	7.83-05	5.99-05	4.66-05	3.66-05	2.87-05
16	1.45-02	4.44-03	1.90-03	9.84-04	5.73-04	3.62-04	2.42-04	1.70-04	1.23-04	9.22-05	7.02-05	5.42-05	4.19-05	3.09-05
15	1.74-02	5.33-03	2.28-03	1.18-03	6.87-04	4.33-04	2.90-04	2.03-04	1.47-04	1.10-04	8.29-05	6.29-05	4.57-05	
14	2.12-02	6.49-03	2.78-03	1.44-03	8.35-04	5.27-04	3.52-04	2.46-04	1.78-04	1.31-04	9.76-05	6.97-05		
13	2.63-02	8.03-03	3.44-03	1.78-03	1.03-03	6.50-04	4.34-04	3.02-04	2.17-04	1.57-04	1.10-04			
12	3.33-02	1.01-02	4.33-03	2.23-03	1.30-03	8.16-04	5.43-04	3.76-04	2.65-04	1.81-04				
11	4.32-02	1.30-02	5.57-03	2.87-03	1.66-03	1.04-03	6.90-04	4.70-04	3.12-04					
10	5.76-02	1.72-02	7.32-03	3.77-03	2.18-03	1.36-03	8.86-04	5.68-04						
9	7.94-02	2.33-02	9.91-03	5.10-03	2.94-03	1.81-03	1.11-03							
8	1.14-01	3.28-02	1.39-02	7.15-03	4.06-03	2.36-03								
7	1.70-01	4.86-02	2.06-02	1.04-02	5.99-03									
6	2.71-01	7.71-02	3.23-02	1.54-02										
5	4.81-01	1.34-01	5.24-02											
4	1.00+00	2.52-01												
3	2 69+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.16-06	9.66-07	8.14-07	6.93-07	5.94-07	5.13-07	4.46-07	3.91-07	3.44-07	3.04-07	2.70-07	2.41-07	2.16-07	1.95-07
45	1.59-06	1.32-06	1.11-06	9.48-07	8.13-07	7.02-07	6.11-07	5.34-07	4.70-07	4.16-07	3.69-07	3.30-07	2.95-07	2.65-07
40	2.25-06	1.88-06	1.58-06	1.34-06	1.15-06	9.96-07	8.65-07	7.57-07	6.66-07	5.88-07	5.22-07	4.66-07	4.17-07	3.74-07
35	3.34-06	2.79-06	2.35-06	1.99-06	1.71-06	1.47-06	1.28-06	1.12-06	9.82-07	8.67-07	7.68-07	6.83-07	6.09-07	5.45-07
30	5.25-06	4.37-06	3.68-06	3.12-06	2.67-06	2.30-06	1.99-06	1.73-06	1.52-06	1.33-06	1.17-06	1.02-06	8.81-07	7.78-07
29	5.79-06	4.82-06	4.05-06	3.44-06	2.94-06	2.53-06	2.19-06	1.90-06	1.66-06	1.45-06	1.28-06	1.08-06	8.81-07	
28	6.40-06	5.33-06	4.48-06	3.80-06	3.24-06	2.79-06	2.41-06	2.09-06	1.81-06	1.57-06	1.35-06	1.09-06		
27	7.10-06	5.91-06	4.96-06	4.20-06	3.59-06	3.08-06	2.65-06	2.29-06	1.98-06	1.68-06	1.36-06			
26	7.89-06	6.56-06	5.51-06	4.66-06	3.97-06	3.40-06	2.92-06	2.50-06	2.12-06	1.70-06				
25	8.81-06	7.32-06	6.14-06	5.18-06	4.41-06	3.76-06	3.20-06	2.70-06	2.15-06					
24	9.86-06	8.18-06	6.85-06	5.77-06	4.89-06	4.14-06	3.47-06	2.75-06						
23	1.11-05	9.17-06	7.66-06	6.43-06	5.41-06	4.50-06	3.55-06							
22	1.25-05	1.03-05	8.57-06	7.14-06	5.90-06	4.62-06								
21	1.41-05	1.16-05	9.57-06	7.84-06	6.09-06									
20	1.59-05	1.30-05	1.06-05	8.14-06										
19	1.80-05	1.45-05	1.10-05											
18	2.01-05	1.52-05												
17	2.14-05													

H TE = 3.00+04 NE = 1.00+07 CASE B NC = 26

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	3.87-38	3.80-38	2.71-38	-1.78-38	-1.26-37	-3.32-37	-6.71-37	-1.19-36	-1.97-36	-3.09-36	-4.66-36	-6.78-36	-9.53-36
45	0.00+00	5.32-38	5.23-38	3.74-38	-2.48-38	-1.76-37	-4.66-37	-9.48-37	-1.70-36	-2.82-36	-4.47-36	-6.82-36	-1.00-35	-1.43-35
40	0.00+00	7.61-38	7.51-38	5.39-38	-3.57-38	-2.56-37	-6.93-37	-1.40-36	-2.54-36	-4.27-36	-6.86-36	-1.06-35	-1.59-35	-2.31-35
35	0.00+00	1.14-37	1.14-37	8.27-38	-5.20-38	-3.90-37	-1.05-36	-2.20-36	-4.04-36	-6.92-36	-1.13-35	-1.80-35	-2.76-35	-4.13-35
30	0.00+00	1.83-37	1.85-37	1.40-37	-7.14-38	-6.19-37	-1.73-36	-3.68-36	-6.95-36	-1.23-35	-2.08-35	-3.43-35	-5.51-35	-8.69-35
29	0.00+00	2.04-37	2.06-37	1.58-37	-7.39-38	-6.81-37	-1.92-36	-4.12-36	-7.83-36	-1.39-35	-2.39-35	-3.97-35	-6.46-35	-1.03-34
28	0.00+00	2.27-37	2.31-37	1.81-37	-7.46-38	-7.49-37	-2.13-36	-4.62-36	-8.86-36	-1.59-35	-2.75-35	-4.64-35	-7.66-35	-1.24-34
27	0.00+00	2.54-37	2.61-37	2.07-37	-7.26-38	-8.22-37	-2.38-36	-5.20-36	-1.01-35	-1.83-35	-3.20-35	-5.46-35	-9.16-35	-1.51-34
26	0.00+00	2.86-37	2.96-37	2.43-37	-5.94-38	-8.85-37	-2.62-36	-5.82-36	-1.13-35	-2.08-35	-3.70-35	-6.43-35	-1.10-34	-1.86-34
25	0.00+00	3.24-37	3.38-37	2.85-37	-4.31-38	-9.59-37	-2.91-36	-6.52-36	-1.29-35	-2.41-35	-4.34-35	-7.69-35	-1.34-34	-2.33-34
24	0.00+00	3.69-37	3.89-37	3.39-37	-1.53-38	-1.03-36	-3.22-36	-7.32-36	-1.48-35	-2.79-35	-5.13-35	-9.29-35	-1.67-34	-2.99-34
23	0.00+00	4.22-37	4.51-37	4.08-37	3.01-38	-1.09-36	-3.55-36	-8.26-36	-1.69-35	-3.25-35	-6.11-35	-1.13-34	-2.11-34	-3.93-34
22	0.00+00	4.86-37	5.27-37	4.97-37	1.01-37	-1.12-36	-3.87-36	-9.25-36	-1.93-35	-3.80-35	-7.32-35	-1.40-34	-2.71-34	-5.32-34
21	0.00+00	5.64-37	6.22-37	6.14-37	2.10-37	-1.12-36	-4.18-36	-1.03-35	-2.20-35	-4.45-35	-8.85-35	-1.77-34	-3.59-34	-7.50-34
20	0.00+00	6.61-37	7.42-37	7.69-37	3.71-37	-1.05-36	-4.44-36	-1.14-35	-2.50-35	-5.22-35	-1.08-34	-2.26-34	-4.91-34	-1.12-33
19	0.00+00	7.80-37	8.95-37	9.73-37	6.07-37	-8.82-37	-4.60-36	-1.24-35	-2.84-35	-6.16-35	-1.34-34	-2.99-34	-7.07-34	-1.83-33
18	0.00+00	9.31-37	1.09-36	1.25-36	9.44-37	-5.81-37	-4.61-36	-1.34-35	-3.21-35	-7.32-35	-1.69-34	-4.12-34	-1.10-33	-3.47-33
17	0.00+00	1.12-36	1.34-36	1.61-36	1.42-36	-9.49-38	-4.44-36	-1.44-35	-3.66-35	-8.86-35	-2.23-34	-6.13-34	-1.99-33	-8.83-33
16	0.00+00	1.37-36	1.68-36	2.10-36	2.09-36	6.46-37	-4.01-36	-1.54-35	-4.22-35	-1.11-34	-3.15-34	-1.05-33	-4.79-33	-4.79-32
15	0.00+00	1.69-36	2.12-36	2.77-36	3.03-36	1.77-36	-3.20-36	-1.64-35	-5.06-35	-1.50-34	-5.11-34	-2.38-33	-2.45-32	
14	0.00+00	2.13-36	2.72-36	3.71-36	4.42-36	3.52-36	-1.72-36	-1.76-35	-6.42-35	-2.30-34	-1.09-33	-1.13-32		
13	0.00+00	2.72-36	3.57-36	5.08-36	6.56-36	6.49-36	1.35-36	-1.81-35	-8.89-35	-4.48-34	-4.69-33			
12	0.00+00	3.56-36	4.81-36	7.18-36	1.01-35	1.21-35	8.80-36	-1.35-35	-1.35-34	-1.55-33				
11	0.00+00	4.78-36	6.68-36	1.06-35	1.65-35	2.40-35	3.12-35	3.00-35	-1.04-34					
10	0.00+00	6.63-36	9.65-36	1.65-35	2.95-35	5.58-35	1.26-34	6.13-34						
9	0.00+00	9.57-36	1.47-35	2.80-35	6.09-35	1.67-34	9.29-34							
8	0.00+00	1.46-35	2.41-35	5.40-35	1.61-34	9.21-34								
7	0.00+00	2.42-35	4.49-35	1.31-34	7.40-34									
6	0.00+00	4.62-35	1.06-34	5.62-34										
5	0.00+00	1.16-34	4.64-34											
4	0.00+00	5.45-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.29-35	-1.69-35	-2.14-35	-2.62-35	-3.13-35	-3.66-35	-4.21-35	-4.79-35	-5.40-35	-6.04-35	-6.74-35	-7.33-35	-8.17-35	-9.13-35
45	-1.97-35	-2.62-35	-3.36-35	-4.20-35	-5.12-35	-6.13-35	-7.22-35	-8.43-35	-9.78-35	-1.13-34	-1.31-34	-1.48-34	-1.72-34	-2.02-34
40	-3.24-35	-4.41-35	-5.82-35	-7.47-35	-9.39-35	-1.16-34	-1.42-34	-1.73-34	-2.10-34	-2.56-34	-3.14-34	-3.80-34	-4.76-34	-6.08-34
35	-6.00-35	-8.46-35	-1.16-34	-1.56-34	-2.07-34	-2.71-34	-3.53-34	-4.63-34	-6.12-34	-8.21-34	-1.13-33	-1.57-33	-2.32-33	-3.63-33
30	-1.33-34	-2.00-34	-2.96-34	-4.32-34	-6.30-34	-9.26-34	-1.38-33	-2.14-33	-3.47-33	-6.07-33	-1.19-32	-2.73-32	-8.92-32	-6.51-31
29	-1.61-34	-2.47-34	-3.73-34	-5.60-34	-8.42-34	-1.28-33	-2.02-33	-3.32-33	-5.86-33	-1.15-32	-2.72-32	-8.79-32	-6.41-31	
28	-1.98-34	-3.10-34	-4.81-34	-7.44-34	-1.16-33	-1.86-33	-3.11-33	-5.57-33	-1.11-32	-2.64-32	-8.70-32	-6.31-31		
27	-2.46-34	-3.97-34	-6.35-34	-1.02-33	-1.68-33	-2.86-33	-5.20-33	-1.05-32	-2.52-32	-8.37-32	-6.06-31			
26	-3.10-34	-5.16-34	-8.59-34	-1.45-33	-2.53-33	-4.68-33	-9.59-33	-2.33-32	-7.81-32	-5.76-31				
25	-4.03-34	-6.96-34	-1.22-33	-2.19-33	-4.15-33	-8.68-33	-2.14-32	-7.29-32	-5.45-31					
24	-5.37-34	-9.75-34	-1.82-33	-3.56-33	-7.62-33	-1.92-32	-6.65-32	-5.04-31						
23	-7.42-34	-1.44-33	-2.91-33	-6.44-33	-1.67-32	-5.89-32	-4.55-31							
22	-1.07-33	-2.26-33	-5.19-33	-1.39-32	-5.04-32	-3.97-31								
21	-1.65-33	-3.94-33	-1.09-32	-4.11-32	-3.33-31									
20	-2.79-33	-8.08-33	-3.16-32	-2.65-31										
19	-5.53-33	-2.26-32	-1.97-31											
18	-1.48-32	-1.36-31												
17	-8.48-32													

H TE = 3.00+04 NE = 1.00+08 CASE B NC = 20

TOTAL RC = 1.001-13 4-2 RC = 1.104-14 4-2 EM = 4.512-26 2S RC = 3.687-14 2P RC = 6.319-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.31-04	1.63-04	7.00-05	3.63-05	2.12-05	1.34-05	9.02-06	6.36-06	4.65-06	3.50-06	2.70-06	2.13-06	1.71-06	1.39-06
45	7.29-04	2.24-04	9.61-05	4.98-05	2.90-05	1.84-05	1.24-05	8.72-06	6.37-06	4.80-06	3.70-06	2.92-06	2.34-06	1.90-06
40	1.04-03	3.18-04	1.37-04	7.09-05	4.13-05	2.62-05	1.76-05	1.24-05	9.07-06	6.83-06	5.27-06	4.15-06	3.33-06	2.71-06
35	1.55-03	4.75-04	2.04-04	1.06-04	6.17-05	3.91-05	2.63-05	1.85-05	1.35-05	1.02-05	7.85-06	6.18-06	4.95-06	4.03-06
30	2.46-03	7.55-04	3.24-04	1.68-04	9.78-05	6.19-05	4.17-05	2.93-05	2.14-05	1.61-05	1.24-05	9.78-06	7.83-06	6.37-06
29	2.72-03	8.35-04	3.59-04	1.86-04	1.08-04	6.85-05	4.61-05	3.25-05	2.37-05	1.78-05	1.37-05	1.08-05	8.66-06	7.04-06
28	3.02-03	9.27-04	3.98-04	2.06-04	1.20-04	7.61-05	5.12-05	3.60-05	2.63-05	1.98-05	1.53-05	1.20-05	9.60-06	7.80-06
27	3.37-03	1.03-03	4.44-04	2.30-04	1.34-04	8.48-05	5.70-05	4.01-05	2.93-05	2.20-05	1.70-05	1.34-05	1.07-05	8.68-06
26	3.77-03	1.16-03	4.97-04	2.57-04	1.50-04	9.49-05	6.38-05	4.49-05	3.28-05	2.46-05	1.90-05	1.49-05	1.19-05	9.70-06
25	4.24-03	1.30-03	5.58-04	2.89-04	1.68-04	1.07-04	7.16-05	5.04-05	3.68-05	2.77-05	2.13-05	1.68-05	1.34-05	1.09-05
24	4.79-03	1.47-03	6.30-04	3.26-04	1.90-04	1.20-04	8.08-05	5.69-05	4.15-05	3.12-05	2.40-05	1.89-05	1.51-05	1.22-05
23	5.43-03	1.66-03	7.15-04	3.70-04	2.15-04	1.36-04	9.16-05	6.44-05	4.70-05	3.53-05	2.72-05	2.14-05	1.71-05	1.38-05
22	6.19-03	1.90-03	8.15-04	4.21-04	2.46-04	1.55-04	1.04-04	7.34-05	5.35-05	4.02-05	3.09-05	2.43-05	1.94-05	1.57-05
21	7.10-03	2.17-03	9.34-04	4.83-04	2.81-04	1.78-04	1.19-04	8.40-05	6.12-05	4.60-05	3.54-05	2.77-05	2.21-05	1.79-05
20	8.17-03	2.50-03	1.08-03	5.56-04	3.24-04	2.05-04	1.37-04	9.66-05	7.04-05	5.28-05	4.06-05	3.18-05	2.53-05	2.04-05
19	9.48-03	2.90-03	1.25-03	6.45-04	3.75-04	2.37-04	1.59-04	1.12-04	8.15-05	6.11-05	4.69-05	3.67-05	2.91-05	2.34-05
18	1.11-02	3.39-03	1.45-03	7.52-04	4.38-04	2.77-04	1.86-04	1.30-04	9.48-05	7.10-05	5.44-05	4.25-05	3.36-05	2.68-05
17	1.30-02	3.98-03	1.71-03	8.83-04	5.14-04	3.25-04	2.18-04	1.53-04	1.11-04	8.30-05	6.35-05	4.93-05	3.87-05	3.04-05
16	1.54-02	4.72-03	2.02-03	1.05-03	6.08-04	3.84-04	2.57-04	1.80-04	1.31-04	9.76-05	7.43-05	5.74-05	4.43-05	3.26-05
15	1.84-02	5.64-03	2.42-03	1.25-03	7.26-04	4.58-04	3.06-04	2.14-04	1.55-04	1.15-04	8.72-05	6.61-05	4.80-05	
14	2.23-02	6.81-03	2.92-03	1.51-03	8.75-04	5.51-04	3.68-04	2.57-04	1.86-04	1.37-04	1.02-04	7.26-05		
13	2.73-02	8.35-03	3.57-03	1.84-03	1.07-03	6.73-04	4.49-04	3.12-04	2.23-04	1.62-04	1.13-04			
12	3.41-02	1.04-02	4.45-03	2.30-03	1.33-03	8.35-04	5.54-04	3.83-04	2.69-04	1.84-04				
11	4.36-02	1.33-02	5.68-03	2.92-03	1.69-03	1.06-03	6.97-04	4.73-04	3.13-04					
10	5.74-02	1.75-02	7.45-03	3.82-03	2.20-03	1.37-03	8.86-04	5.66-04						
9	7.84-02	2.37-02	1.01-02	5.15-03	2.94-03	1.80-03	1.10-03							
8	1.12-01	3.35-02	1.41-02	7.17-03	4.03-03	2.32-03								
7	1.69-01	4.95-02	2.07-02	1.03-02	5.45-03									
6	2.75-01	7.75-02	3.17-02	1.49-02										
5	4.89-01	1.32-01	5.06-02											
4	1.00+00	2.46-01												
3	2.66+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.14-06	9.55-07	8.05-07	6.85-07	5.87-07	5.07-07	4.41-07	3.86-07	3.40-07	3.01-07	2.67-07	2.39-07	2.14-07	1.92-07
45	1.57-06	1.31-06	1.10-06	9.38-07	8.04-07	6.95-07	6.04-07	5.29-07	4.65-07	4.11-07	3.65-07	3.26-07	2.92-07	2.63-07
40	2.23-06	1.86-06	1.57-06	1.33-06	1.14-06	9.86-07	8.57-07	7.50-07	6.59-07	5.83-07	5.17-07	4.61-07	4.13-07	3.71-07
35	3.32-06	2.77-06	2.33-06	1.98-06	1.70-06	1.46-06	1.27-06	1.11-06	9.76-07	8.61-07	7.63-07	6.78-07	6.05-07	5.41-07
30	5.24-06	4.37-06	3.67-06	3.12-06	2.67-06	2.30-06	1.99-06	1.73-06	1.51-06	1.33-06	1.17-06	1.02-06	8.80-07	7.18-07
29	5.79-06	4.82-06	4.06-06	3.44-06	2.94-06	2.53-06	2.19-06	1.90-06	1.66-06	1.45-06	1.26-06	1.09-06	8.82-07	
28	6.42-06	5.35-06	4.49-06	3.81-06	3.25-06	2.80-06	2.42-06	2.10-06	1.82-06	1.58-06	1.35-06	1.09-06		
27	7.14-06	5.94-06	4.99-06	4.23-06	3.61-06	3.10-06	2.67-06	2.31-06	1.99-06	1.69-06	1.36-06			
26	7.97-06	6.63-06	5.57-06	4.71-06	4.01-06	3.44-06	2.95-06	2.53-06	2.14-06	1.72-06				
25	8.93-06	7.42-06	6.22-06	5.26-06	4.47-06	3.81-06	3.25-06	2.74-06	2.18-06					
24	1.00-05	8.34-06	6.98-06	5.88-06	4.98-06	4.22-06	3.53-06	2.80-06						
23	1.13-05	9.40-06	7.85-06	6.59-06	5.54-06	4.61-06	3.63-06							
22	1.28-05	1.06-05	8.83-06	7.36-06	6.08-06	4.76-06								
21	1.46-05	1.20-05	9.92-06	8.13-06	6.31-06									
20	1.66-05	1.36-05	1.10-05	8.49-06										
19	1.89-05	1.52-05	1.16-05											
18	2.13-05	1.61-05												
17	2.27-05													

H TE = 3.00+04 NE = 1.00+08 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.62-32	3.67-38	3.07-38	6.83-39	-5.42-38	-1.67-37	-3.56-37	-6.54-37	-1.10-36	-1.71-36	-2.46-36	-3.27-36	-4.07-36	-4.79-36
45	4.97-32	5.05-38	4.22-38	9.20-39	-7.59-38	-2.35-37	-5.02-37	-9.28-37	-1.57-36	-2.46-36	-3.58-36	-4.82-36	-6.08-36	-7.24-36
40	7.09-32	7.22-38	6.04-38	1.28-38	-1.11-37	-3.44-37	-7.42-37	-1.38-36	-2.37-36	-3.76-36	-5.54-36	-7.60-36	-9.75-36	-1.19-35
35	1.06-31	1.08-37	9.09-38	1.87-38	-1.72-37	-5.36-37	-1.17-36	-2.21-36	-3.84-36	-6.22-36	-9.36-36	-1.32-35	-1.74-35	-2.18-35
30	1.69-31	1.73-37	1.46-37	2.92-38	-2.86-37	-9.05-37	-2.01-36	-3.88-36	-6.93-36	-1.16-35	-1.80-35	-2.63-35	-3.64-35	-4.82-35
29	1.88-31	1.92-37	1.63-37	3.23-38	-3.20-37	-1.02-36	-2.27-36	-4.41-36	-7.93-36	-1.33-35	-2.10-35	-3.10-35	-4.34-35	-5.83-35
28	2.09-31	2.14-37	1.81-37	3.61-38	-3.60-37	-1.15-36	-2.57-36	-5.04-36	-9.14-36	-1.55-35	-2.47-35	-3.70-35	-5.25-35	-7.17-35
27	2.33-31	2.40-37	2.03-37	4.06-38	-4.06-37	-1.30-36	-2.94-36	-5.80-36	-1.06-35	-1.82-35	-2.93-35	-4.46-35	-6.44-35	-8.97-35
26	2.62-31	2.69-37	2.29-37	4.61-38	-4.61-37	-1.49-36	-3.37-36	-6.73-36	-1.24-35	-2.16-35	-3.53-35	-5.45-35	-8.02-35	-1.14-34
25	2.95-31	3.04-37	2.60-37	5.31-38	-5.25-37	-1.70-36	-3.90-36	-7.86-36	-1.47-35	-2.59-35	-4.30-35	-6.77-35	-1.02-34	-1.49-34
24	3.34-31	3.45-37	2.96-37	6.21-38	-6.00-37	-1.97-36	-4.55-36	-9.26-36	-1.75-35	-3.14-35	-5.32-35	-8.56-35	-1.33-34	-2.00-34
23	3.80-31	3.94-37	3.40-37	7.39-38	-6.89-37	-2.28-36	-5.34-36	-1.10-35	-2.12-35	-3.86-35	-6.70-35	-1.11-34	-1.77-34	-2.79-34
22	4.36-31	4.53-37	3.93-37	9.02-38	-7.93-37	-2.67-36	-6.31-36	-1.32-35	-2.59-35	-4.84-35	-8.61-35	-1.47-34	-2.45-34	-4.05-34
21	5.03-31	5.25-37	4.60-37	1.13-37	-9.15-37	-3.13-36	-7.53-36	-1.61-35	-3.22-35	-6.17-35	-1.13-34	-2.02-34	-3.53-34	-6.23-34
20	5.84-31	6.13-37	5.44-37	1.50-37	-1.05-36	-3.68-36	-9.01-36	-1.96-35	-4.04-35	-8.00-35	-1.53-34	-2.86-34	-5.34-34	-1.03-33
19	6.84-31	7.22-37	6.50-37	2.02-37	-1.20-36	-4.35-36	-1.09-35	-2.44-35	-5.20-35	-1.07-34	-2.15-34	-4.30-34	-8.74-34	-1.90-33
18	8.08-31	8.60-37	7.89-37	2.82-37	-1.36-36	-5.16-36	-1.33-35	-3.08-35	-6.82-35	-1.48-34	-3.18-34	-6.92-34	-1.59-33	-4.19-33
17	9.69-31	1.04-36	9.74-37	4.08-37	-1.52-36	-6.12-36	-1.64-35	-3.94-35	-9.17-35	-2.12-34	-4.99-34	-1.23-33	-3.44-33	-1.27-32
16	1.17-30	1.27-36	1.23-36	6.09-37	-1.64-36	-7.21-36	-2.02-35	-5.12-35	-1.27-34	-3.23-34	-8.61-34	-2.58-33	-1.02-32	-8.43-32
15	1.43-30	1.57-36	1.57-36	9.33-37	-1.66-36	-8.40-36	-2.50-35	-6.78-35	-1.85-34	-5.32-34	-1.73-33	-7.32-33	-6.47-32	
14	1.77-30	1.98-36	2.07-36	1.46-36	-1.48-36	-9.58-36	-3.10-35	-9.22-35	-2.86-34	-1.00-33	-4.62-33	-4.42-32		
13	2.24-30	2.55-36	2.80-36	2.30-36	-9.28-37	-1.06-35	-3.89-35	-1.32-34	-4.97-34	-2.48-33	-2.59-32			
12	2.90-30	3.37-36	3.87-36	3.66-36	2.12-37	-1.15-35	-5.06-35	-2.09-34	-1.12-33	-1.26-32				
11	3.84-30	4.57-36	5.53-36	5.88-36	2.34-36	-1.26-35	-7.36-35	-4.30-34	-5.16-33					
10	5.25-30	6.43-36	8.21-36	9.77-36	6.46-36	-1.49-35	-1.43-34	-1.85-33						
9	7.48-30	9.47-36	1.29-35	1.73-35	1.57-35	-2.41-35	-6.13-34							
8	1.12-29	1.48-35	2.21-35	3.48-35	4.41-35	-1.06-34								
7	1.81-29	2.52-35	4.28-35	8.91-35	2.33-34									
6	3.25-29	4.87-35	1.05-34	4.35-34										
5	6.96-29	1.21-34	4.66-34											
4	2.08-28	5.53-34												
3	1.51-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.37-36	-5.80-36	-6.08-36	-6.20-36	-6.18-36	-5.80-36	-5.43-36	-4.86-36	-4.06-36	-2.97-36	-1.53-36	3.72-37	2.89-36	6.06-36
45	-8.25-36	-9.08-36	-9.73-36	-1.02-35	-1.04-35	-1.01-35	-9.92-36	-9.39-36	-8.52-36	-7.15-36	-5.17-36	-2.30-36	1.76-36	7.46-36
40	-1.38-35	-1.56-35	-1.73-35	-1.87-35	-1.99-35	-2.04-35	-2.12-35	-2.16-35	-2.15-35	-2.07-35	-1.89-35	-1.53-35	-8.98-36	1.79-36
35	-2.63-35	-3.10-35	-3.59-35	-4.10-35	-4.66-35	-5.14-35	-5.82-35	-6.59-35	-7.50-35	-8.55-35	-9.78-35	-1.11-34	-1.25-34	-1.35-34
30	-6.19-35	-7.81-35	-9.80-35	-1.23-34	-1.56-34	-1.98-34	-2.62-34	-3.67-34	-5.27-34	-8.25-34	-1.45-33	-3.02-33	-8.74-33	-5.57-32
29	-7.63-35	-9.83-35	-1.26-34	-1.63-34	-2.14-34	-2.83-34	-3.96-34	-5.84-34	-9.32-34	-1.66-33	-3.56-33	-1.06-32	-6.93-32	
28	-9.56-35	-1.26-34	-1.67-34	-2.23-34	-3.05-34	-4.24-34	-6.34-34	-1.02-33	-1.86-33	-4.03-33	-1.22-32	-8.20-32		
27	-1.22-34	-1.66-34	-2.26-34	-3.15-34	-4.54-34	-6.75-34	-1.10-33	-2.02-33	-4.45-33	-1.36-32	-9.34-32			
26	-1.60-34	-2.25-34	-3.19-34	-4.66-34	-7.20-34	-1.17-33	-2.16-33	-4.81-33	-1.49-32	-1.03-31				
25	-2.16-34	-3.16-34	-4.72-34	-7.38-34	-1.24-33	-2.28-33	-5.12-33	-1.60-32	-1.12-31					
24	-3.02-34	-4.64-34	-7.40-34	-1.26-33	-2.40-33	-5.35-33	-1.69-32	-1.19-31						
23	-4.42-34	-7.23-34	-1.26-33	-2.43-33	-5.59-33	-1.76-32	-1.25-31							
22	-6.85-34	-1.22-33	-2.40-33	-5.62-33	-1.81-32	-1.29-31								
21	-1.15-33	-2.32-33	-5.52-33	-1.81-32	-1.29-31									
20	-2.14-33	-5.21-33	-1.74-32	-1.27-31										
19	-4.79-33	-1.64-32	-1.22-31											
18	-1.49-32	-1.14-31												
17	-1.01-31													

H TE = 3.00+04 NE = 1.00+09 CASE B NC = 20

TOTAL RC = 1.009-13 4-2 RC = 1.132-14 4-2 EM = 4.624-26 2S RC = 3.665-14 2P RC = 6.427-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.18-04	1.59-04	6.84-05	3.54-05	2.07-05	1.31-05	8.80-06	6.20-06	4.54-06	3.42-06	2.64-06	2.08-06	1.66-06	1.35-06
45	7.11-04	2.18-04	9.38-05	4.86-05	2.83-05	1.79-05	1.21-05	8.51-06	6.22-06	4.68-06	3.61-06	2.85-06	2.28-06	1.86-06
40	1.01-03	3.11-04	1.34-04	6.92-05	4.04-05	2.56-05	1.72-05	1.21-05	8.86-06	6.67-06	5.14-06	4.05-06	3.25-06	2.64-06
35	1.51-03	4.64-04	2.00-04	1.03-04	6.03-05	3.82-05	2.57-05	1.81-05	1.32-05	9.94-06	7.67-06	6.04-06	4.84-06	3.93-06
30	2.41-03	7.38-04	3.17-04	1.64-04	9.57-05	6.06-05	4.07-05	2.87-05	2.10-05	1.58-05	1.22-05	9.57-06	7.66-06	6.23-06
29	2.66-03	8.17-04	3.51-04	1.82-04	1.06-04	6.71-05	4.51-05	3.18-05	2.32-05	1.74-05	1.35-05	1.06-05	8.47-06	6.89-06
28	2.96-03	9.08-04	3.90-04	2.02-04	1.18-04	7.45-05	5.01-05	3.53-05	2.58-05	1.94-05	1.49-05	1.17-05	9.40-06	7.64-06
27	3.30-03	1.01-03	4.35-04	2.25-04	1.31-04	8.31-05	5.59-05	3.93-05	2.87-05	2.16-05	1.66-05	1.31-05	1.05-05	8.51-06
26	3.70-03	1.13-03	4.87-04	2.52-04	1.47-04	9.30-05	6.25-05	4.40-05	3.21-05	2.42-05	1.86-05	1.46-05	1.17-05	9.51-06
25	4.16-03	1.28-03	5.48-04	2.84-04	1.65-04	1.05-04	7.03-05	4.95-05	3.61-05	2.72-05	2.09-05	1.64-05	1.32-05	1.07-05
24	4.71-03	1.44-03	6.20-04	3.21-04	1.87-04	1.18-04	7.94-05	5.59-05	4.08-05	3.07-05	2.36-05	1.86-05	1.48-05	1.20-05
23	5.35-03	1.64-03	7.04-04	3.64-04	2.12-04	1.34-04	9.02-05	6.35-05	4.63-05	3.48-05	2.68-05	2.10-05	1.68-05	1.36-05
22	6.11-03	1.87-03	8.04-04	4.16-04	2.42-04	1.53-04	1.03-04	7.25-05	5.28-05	3.97-05	3.05-05	2.40-05	1.91-05	1.55-05
21	7.03-03	2.15-03	9.25-04	4.78-04	2.79-04	1.76-04	1.18-04	8.32-05	6.07-05	4.55-05	3.50-05	2.75-05	2.19-05	1.77-05
20	8.13-03	2.49-03	1.07-03	5.53-04	3.22-04	2.04-04	1.37-04	9.61-05	7.01-05	5.26-05	4.04-05	3.16-05	2.52-05	2.03-05
19	9.48-03	2.91-03	1.25-03	6.45-04	3.75-04	2.37-04	1.59-04	1.12-04	8.15-05	6.11-05	4.69-05	3.67-05	2.91-05	2.34-05
18	1.11-02	3.41-03	1.46-03	7.57-04	4.41-04	2.78-04	1.87-04	1.31-04	9.54-05	7.14-05	5.47-05	4.27-05	3.38-05	2.69-05
17	1.32-02	4.04-03	1.73-03	8.96-04	5.21-04	3.29-04	2.21-04	1.55-04	1.13-04	8.42-05	6.43-05	5.00-05	3.93-05	3.08-05
16	1.58-02	4.84-03	2.07-03	1.07-03	6.23-04	3.93-04	2.63-04	1.85-04	1.34-04	9.99-05	7.61-05	5.87-05	4.53-05	3.34-05
15	1.91-02	5.84-03	2.50-03	1.29-03	7.51-04	4.74-04	3.17-04	2.22-04	1.61-04	1.19-04	9.02-05	6.84-05	4.96-05	
14	2.33-02	7.14-03	3.06-03	1.58-03	9.46-04	5.77-04	3.85-04	2.69-04	1.94-04	1.43-04	1.06-04	7.58-05		
13	2.88-02	8.82-03	3.78-03	1.95-03	1.13-03	7.10-04	4.73-04	3.29-04	2.35-04	1.71-04	1.19-04			
12	3.61-02	1.10-02	4.72-03	2.43-03	1.41-03	8.83-04	5.86-04	4.05-04	2.85-04	1.94-04				
11	4.59-02	1.40-02	5.99-03	3.08-03	1.78-03	1.11-03	7.33-04	4.97-04	3.29-04					
10	5.96-02	1.82-02	7.75-03	3.98-03	2.29-03	1.42-03	9.19-04	5.87-04						
9	7.97-02	2.42-02	1.03-02	5.27-03	3.01-03	1.83-03	1.12-03							
8	1.11-01	3.38-02	1.43-02	7.25-03	4.07-03	2.33-03								
7	1.65-01	4.96-02	2.08-02	1.04-02	5.47-03									
6	2.65-01	7.80-02	3.20-02	1.49-02										
5	4.77-01	1.33-01	5.04-02											
4	1.00+00	2.41-01												
3	2.62+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.12-06	9.32-07	7.86-07	6.68-07	5.73-07	4.95-07	4.31-07	3.77-07	3.32-07	2.94-07	2.61-07	2.33-07	2.09-07	1.88-07
45	1.53-06	1.28-06	1.08-06	9.16-07	7.85-07	6.78-07	5.90-07	5.16-07	4.54-07	4.01-07	3.57-07	3.18-07	2.85-07	2.56-07
40	2.18-06	1.82-06	1.53-06	1.30-06	1.11-06	9.63-07	8.37-07	7.32-07	6.44-07	5.69-07	5.05-07	4.50-07	4.03-07	3.62-07
35	3.24-06	2.70-06	2.28-06	1.93-06	1.66-06	1.43-06	1.24-06	1.08-06	9.53-07	8.41-07	7.45-07	6.63-07	5.91-07	5.28-07
30	5.13-06	4.27-06	3.59-06	3.05-06	2.61-06	2.25-06	1.95-06	1.69-06	1.48-06	1.30-06	1.14-06	9.97-07	8.61-07	7.02-07
29	5.67-06	4.72-06	3.97-06	3.37-06	2.88-06	2.48-06	2.14-06	1.86-06	1.63-06	1.42-06	1.24-06	1.06-06	8.63-07	
28	6.29-06	5.23-06	4.40-06	3.73-06	3.19-06	2.74-06	2.37-06	2.05-06	1.78-06	1.55-06	1.32-06	1.07-06		
27	7.00-06	5.82-06	4.89-06	4.14-06	3.54-06	3.03-06	2.62-06	2.26-06	1.95-06	1.66-06	1.34-06			
26	7.82-06	6.50-06	5.46-06	4.62-06	3.93-06	3.37-06	2.89-06	2.48-06	2.10-06	1.68-06				
25	8.77-06	7.29-06	6.11-06	5.16-06	4.39-06	3.74-06	3.19-06	2.69-06	2.14-06					
24	9.88-06	8.20-06	6.86-06	5.79-06	4.90-06	4.15-06	3.47-06	2.75-06						
23	1.12-05	9.26-06	7.73-06	6.49-06	5.45-06	4.54-06	3.57-06							
22	1.27-05	1.05-05	8.72-06	7.27-06	6.00-06	4.70-06								
21	1.45-05	1.19-05	9.83-06	8.05-06	6.25-06									
20	1.65-05	1.35-05	1.10-05	8.44-06										
19	1.89-05	1.52-05	1.16-05											
18	2.14-05	1.62-05												
17	2.30-05													

H TE = 3.00+04 NE = 1.00+09 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.05-33	2.85-38	1.52-38	-1.19-38	-6.22-38	-1.51-37	-2.89-37	-4.60-37	-6.17-37	-7.09-37	-7.11-37	-6.23-37	-4.41-37	-1.71-37
45	5.57-33	3.92-38	2.08-38	-1.66-38	-8.69-38	-2.12-37	-4.07-37	-6.54-37	-8.85-37	-1.03-36	-1.05-36	-9.37-37	-6.93-37	-3.13-37
40	7.94-33	5.60-38	2.98-38	-2.44-38	-1.27-37	-3.11-37	-6.04-37	-9.80-37	-1.34-36	-1.59-36	-1.65-36	-1.52-36	-1.19-36	-6.38-37
35	1.19-32	8.40-38	4.46-38	-3.79-38	-1.97-37	-4.86-37	-9.55-37	-1.57-36	-2.20-36	-2.66-36	-2.86-36	-2.75-36	-2.31-36	-1.49-36
30	1.90-32	1.34-37	7.12-38	-6.40-38	-3.30-37	-8.28-37	-1.66-36	-2.80-36	-4.04-36	-5.07-36	-5.72-36	-5.88-36	-5.45-36	-4.29-36
29	2.10-32	1.49-37	7.89-38	-7.20-38	-3.71-37	-9.34-37	-1.88-36	-3.20-36	-4.65-36	-5.89-36	-6.73-36	-7.04-36	-6.69-36	-5.51-36
28	2.34-32	1.66-37	8.79-38	-8.13-38	-4.19-37	-1.06-36	-2.15-36	-3.68-36	-5.39-36	-6.91-36	-8.01-36	-8.54-36	-8.34-36	-7.19-36
27	2.61-32	1.86-37	9.82-38	-9.23-38	-4.75-37	-1.21-36	-2.46-36	-4.26-36	-6.30-36	-8.19-36	-9.65-36	-1.05-35	-1.06-35	-9.55-36
26	2.93-32	2.08-37	1.10-37	-1.05-37	-5.43-37	-1.39-36	-2.85-36	-4.97-36	-7.45-36	-9.82-36	-1.18-35	-1.31-35	-1.36-35	-1.30-35
25	3.30-32	2.35-37	1.24-37	-1.21-37	-6.24-37	-1.61-36	-3.33-36	-5.87-36	-8.90-36	-1.19-35	-1.46-35	-1.67-35	-1.80-35	-1.81-35
24	3.74-32	2.67-37	1.41-37	-1.40-37	-7.23-37	-1.87-36	-3.92-36	-6.99-36	-1.08-35	-1.47-35	-1.84-35	-2.17-35	-2.44-35	-2.60-35
23	4.26-32	3.04-37	1.61-37	-1.64-37	-8.43-37	-2.20-36	-4.66-36	-8.44-36	-1.32-35	-1.85-35	-2.38-35	-2.90-35	-3.41-35	-3.87-35
22	4.88-32	3.50-37	1.85-37	-1.92-37	-9.93-37	-2.62-36	-5.62-36	-1.03-35	-1.65-35	-2.37-35	-3.14-35	-4.00-35	-4.95-35	-6.05-35
21	5.63-32	4.04-37	2.15-37	-2.27-37	-1.18-36	-3.15-36	-6.86-36	-1.29-35	-2.11-35	-3.11-35	-4.28-35	-5.71-35	-7.55-35	-1.01-34
20	6.54-32	4.71-37	2.51-37	-2.71-37	-1.42-36	-3.84-36	-8.50-36	-1.63-35	-2.75-35	-4.19-35	-6.05-35	-8.54-35	-1.22-34	-1.80-34
19	7.66-32	5.54-37	2.96-37	-3.26-37	-1.72-36	-4.74-36	-1.07-35	-2.12-35	-3.69-35	-5.87-35	-8.95-35	-1.36-34	-2.14-34	-3.66-34
18	9.05-32	6.58-37	3.55-37	-3.96-37	-2.12-36	-5.95-36	-1.38-35	-2.82-35	-5.12-35	-8.61-35	-1.41-34	-2.35-34	-4.25-34	-8.94-34
17	1.08-31	7.90-37	4.30-37	-4.83-37	-2.64-36	-7.62-36	-1.83-35	-3.88-35	-7.43-35	-1.34-34	-2.40-34	-4.58-34	-1.01-33	-3.05-33
16	1.30-31	9.61-37	5.33-37	-5.93-37	-3.35-36	-9.95-36	-2.49-35	-5.56-35	-1.14-34	-2.25-34	-4.59-34	-1.07-33	-3.37-33	-2.30-32
15	1.60-31	1.19-36	6.75-37	-7.25-37	-4.30-36	-1.33-35	-3.50-35	-8.38-35	-1.88-34	-4.23-34	-1.05-33	-3.48-33	-2.48-32	
14	1.98-31	1.49-36	8.82-37	-8.73-37	-5.59-36	-1.83-35	-5.16-35	-1.35-34	-3.46-34	-9.46-34	-3.34-33	-2.49-32		
13	2.51-31	1.92-36	1.20-36	-1.01-36	-7.33-36	-2.59-35	-8.01-35	-2.40-34	-7.48-34	-2.90-33	-2.31-32			
12	3.24-31	2.54-36	1.71-36	-1.06-36	-9.62-36	-3.78-35	-1.34-34	-4.93-34	-2.19-33	-1.92-32				
11	4.30-31	3.47-36	2.58-36	-7.41-37	-1.24-35	-5.73-35	-2.52-34	-1.14-33	-1.35-32					
10	5.88-31	4.94-36	4.15-36	4.28-37	-1.52-35	-9.23-35	-5.95-34	-7.27-33						
9	8.37-31	7.39-36	7.10-36	3.63-36	-1.66-35	-1.73-34	-2.67-33							
8	1.26-30	1.18-35	1.30-35	1.18-35	-1.36-35	-5.84-34								
7	2.04-30	2.06-35	2.69-35	3.62-35	3.65-36									
6	3.64-30	4.16-35	6.91-35	1.46-34										
5	7.79-30	1.08-34	2.92-34											
4	2.33-29	4.98-34												
3	1.69-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.92-37	6.57-37	1.24-36	1.95-36	2.82-36	3.91-36	5.21-36	6.80-36	8.73-36	1.11-35	1.40-35	1.76-35	2.21-35	2.76-35
45	2.10-37	8.96-37	1.77-36	2.88-36	4.27-36	6.07-36	8.27-36	1.10-35	1.46-35	1.90-35	2.47-35	3.21-35	4.17-35	5.43-35
40	1.55-37	1.24-36	2.67-36	4.55-36	7.02-36	1.03-35	1.46-35	2.03-35	2.79-35	3.81-35	5.21-35	7.17-35	9.95-35	1.40-34
35	-2.12-37	1.64-36	4.27-36	7.94-36	1.31-35	2.05-35	3.10-35	4.62-35	6.87-35	1.03-34	1.56-34	2.45-34	3.97-34	6.28-34
30	-2.15-36	1.40-36	7.07-36	1.61-35	3.05-35	5.50-35	9.57-35	1.69-34	3.07-34	5.96-34	1.28-33	3.29-33	1.17-32	9.22-32
29	-3.17-36	9.14-37	7.71-36	1.89-35	3.78-35	7.13-35	1.31-34	2.45-34	4.86-34	1.06-33	2.75-33	9.89-33	7.86-32	
28	-4.66-36	2.63-38	8.23-36	2.25-35	4.77-35	9.57-35	1.88-34	3.84-34	8.60-34	2.27-33	8.21-33	6.58-32		
27	-6.90-36	-1.56-36	8.42-36	2.69-35	6.21-35	1.35-34	2.89-34	6.70-34	1.82-33	6.72-33	5.42-32			
26	-1.04-35	-4.41-36	7.79-36	3.24-35	8.36-35	2.02-34	4.94-34	1.39-33	5.31-33	4.42-32				
25	-1.60-35	-9.70-36	5.03-36	3.85-35	1.17-34	3.31-34	9.92-34	3.95-33	3.38-32					
24	-2.53-35	-1.97-35	-2.70-36	4.37-35	1.76-34	6.30-34	2.71-33	2.44-32						
23	-4.17-35	-3.98-35	-2.35-35	4.04-35	2.88-34	1.59-33	1.59-32							
22	-7.27-35	-8.39-35	-8.29-35	-1.09-35	5.47-34	8.14-33								
21	-1.37-34	-1.93-34	-2.83-34	-3.77-34	1.45-33									
20	-2.86-34	-5.16-34	-1.18-33	-4.93-33										
19	-7.26-34	-1.93-33	-1.08-32											
18	-2.56-33	-1.58-32												
17	-1.99-32													

H TE = 3.00+04 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 1.025-13 4-2 RC = 1.119-14 4-2 EM = 4.572-26 2S RC = 3.204-14 2P RC = 7.047-14

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.24-04	1.61-04	6.91-05	3.58-05	2.09-05	1.32-05	8.91-06	6.28-06	4.59-06	3.46-06	2.67-06	2.10-06	1.68-06	1.37-06
45	7.20-04	2.21-04	9.49-05	4.91-05	2.87-05	1.82-05	1.22-05	8.61-06	6.29-06	4.74-06	3.66-06	2.88-06	2.31-06	1.88-06
40	1.03-03	3.14-04	1.35-04	7.00-05	4.08-05	2.59-05	1.74-05	1.23-05	8.96-06	6.74-06	5.20-06	4.10-06	3.28-06	2.67-06
35	1.51-03	4.70-04	2.02-04	1.05-04	6.10-05	3.86-05	2.60-05	1.83-05	1.34-05	1.01-05	7.76-06	6.11-06	4.89-06	3.98-06
30	2.44-03	7.47-04	3.21-04	1.66-04	9.68-05	6.13-05	4.12-05	2.90-05	2.12-05	1.60-05	1.23-05	9.68-06	7.75-06	6.30-06
29	2.70-03	8.27-04	3.55-04	1.84-04	1.07-04	6.79-05	4.56-05	3.21-05	2.35-05	1.77-05	1.36-05	1.07-05	8.58-06	6.97-06
28	3.00-03	9.19-04	3.95-04	2.04-04	1.19-04	7.54-05	5.07-05	3.57-05	2.61-05	1.96-05	1.51-05	1.19-05	9.52-06	7.73-06
27	3.34-03	1.03-03	4.40-04	2.28-04	1.33-04	8.41-05	5.65-05	3.98-05	2.91-05	2.19-05	1.68-05	1.33-05	1.06-05	8.61-06
26	3.75-03	1.15-03	4.93-04	2.55-04	1.49-04	9.42-05	6.33-05	4.46-05	3.25-05	2.45-05	1.89-05	1.48-05	1.19-05	9.63-06
25	4.22-03	1.29-03	5.55-04	2.87-04	1.67-04	1.06-04	7.12-05	5.01-05	3.66-05	2.75-05	2.12-05	1.67-05	1.33-05	1.08-05
24	4.77-03	1.46-03	6.28-04	3.25-04	1.89-04	1.20-04	8.05-05	5.66-05	4.13-05	3.11-05	2.39-05	1.88-05	1.50-05	1.22-05
23	5.42-03	1.66-03	7.14-04	3.69-04	2.15-04	1.36-04	9.14-05	6.43-05	4.69-05	3.53-05	2.71-05	2.13-05	1.70-05	1.38-05
22	6.20-03	1.90-03	8.16-04	4.22-04	2.46-04	1.55-04	1.04-04	7.35-05	5.36-05	4.03-05	3.10-05	2.43-05	1.94-05	1.57-05
21	7.13-03	2.19-03	9.38-04	4.85-04	2.83-04	1.79-04	1.20-04	8.44-05	6.16-05	4.62-05	3.55-05	2.79-05	2.22-05	1.80-05
20	8.26-03	2.53-03	1.09-03	5.62-04	3.27-04	2.07-04	1.39-04	9.76-05	7.12-05	5.34-05	4.10-05	3.21-05	2.56-05	2.06-05
19	9.64-03	2.96-03	1.27-03	6.56-04	3.82-04	2.41-04	1.62-04	1.14-04	8.29-05	6.21-05	4.77-05	3.73-05	2.96-05	2.38-05
18	1.14-02	3.48-03	1.49-03	7.71-04	4.49-04	2.84-04	1.90-04	1.34-04	9.72-05	7.28-05	5.58-05	4.35-05	3.44-05	2.74-05
17	1.35-02	4.13-03	1.77-03	9.16-04	5.33-04	3.36-04	2.26-04	1.58-04	1.15-04	8.60-05	6.57-05	5.11-05	4.01-05	3.14-05
16	1.62-02	4.96-03	2.13-03	1.10-03	6.39-04	4.03-04	2.70-04	1.89-04	1.37-04	1.02-04	7.80-05	6.02-05	4.64-05	3.42-05
15	1.97-02	6.02-03	2.58-03	1.33-03	7.75-04	4.88-04	3.27-04	2.29-04	1.66-04	1.23-04	9.29-05	7.04-05	5.11-05	
14	2.42-02	7.41-03	3.17-03	1.64-03	9.51-04	5.99-04	4.00-04	2.79-04	2.01-04	1.48-04	1.10-04	7.86-05		
13	3.03-02	9.25-03	3.96-03	2.04-03	1.18-03	7.45-04	4.96-04	3.45-04	2.47-04	1.79-04	1.25-04			
12	3.84-02	1.17-02	5.02-03	2.59-03	1.50-03	9.39-04	6.23-04	4.30-04	3.02-04	2.06-04				
11	4.97-02	1.52-02	6.48-03	3.33-03	1.93-03	1.20-03	7.92-04	5.37-04	3.55-04					
10	6.56-02	2.00-02	8.54-03	4.38-03	2.52-03	1.56-03	1.01-03	6.44-04						
9	8.86-02	2.70-02	1.15-02	5.86-03	3.35-03	2.04-03	1.24-03							
8	1.23-01	3.73-02	1.58-02	8.01-03	4.49-03	2.58-03								
7	1.77-01	5.36-02	2.25-02	1.12-02	5.92-03									
6	2.75-01	8.24-02	3.40-02	1.59-02										
5	4.80-01	1.40-01	5.40-02											
4	1.00+00	2.62-01												
3	2.73+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.13-06	9.43-07	7.95-07	6.76-07	5.80-07	5.01-07	4.36-07	3.81-07	3.36-07	2.97-07	2.64-07	2.36-07	2.11-07	1.90-07
45	1.55-06	1.29-06	1.09-06	9.26-07	7.94-07	6.86-07	5.97-07	5.22-07	4.59-07	4.06-07	3.61-07	3.22-07	2.88-07	2.59-07
40	2.20-06	1.84-06	1.55-06	1.32-06	1.13-06	9.74-07	8.47-07	7.40-07	6.51-07	5.75-07	5.11-07	4.55-07	4.08-07	3.66-07
35	3.28-06	2.73-06	2.30-06	1.96-06	1.68-06	1.45-06	1.26-06	1.10-06	9.64-07	8.51-07	7.54-07	6.70-07	5.98-07	5.35-07
30	5.19-06	4.32-06	3.64-06	3.09-06	2.64-06	2.27-06	1.97-06	1.71-06	1.50-06	1.31-06	1.15-06	1.01-06	8.71-07	7.70-07
29	5.74-06	4.78-06	4.02-06	3.41-06	2.91-06	2.51-06	2.17-06	1.89-06	1.65-06	1.44-06	1.25-06	1.08-06	8.74-07	
28	6.36-06	5.30-06	4.45-06	3.78-06	3.22-06	2.77-06	2.40-06	2.08-06	1.80-06	1.56-06	1.34-06	1.08-06		
27	7.09-06	5.90-06	4.95-06	4.20-06	3.58-06	3.07-06	2.65-06	2.29-06	1.97-06	1.68-06	1.35-06			
26	7.92-06	6.58-06	5.53-06	4.68-06	3.98-06	3.41-06	2.93-06	2.51-06	2.13-06	1.71-06				
25	8.88-06	7.38-06	6.19-06	5.23-06	4.44-06	3.79-06	3.23-06	2.72-06	2.17-06					
24	1.00-05	8.31-06	6.95-06	5.86-06	4.96-06	4.20-06	3.52-06	2.79-06						
23	1.13-05	9.38-06	7.84-06	6.58-06	5.53-06	4.60-06	3.62-06							
22	1.29-05	1.06-05	8.85-06	7.37-06	6.09-06	4.76-06								
21	1.47-05	1.21-05	9.97-06	8.17-06	6.35-06									
20	1.68-05	1.37-05	1.11-05	8.58-06										
19	1.92-05	1.54-05	1.18-05											
18	2.18-05	1.65-05												
17	2.35-05													

H TE = 3.00+04 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.16-34	1.58-38	4.61-39	-1.24-38	-4.22-38	-7.31-38	-7.21-38	-2.02-38	8.23-38	2.32-37	4.30-37	6.79-37	9.87-37	1.36-36
45	5.72-34	2.18-38	6.30-39	-1.73-38	-5.91-38	-1.03-37	-1.03-37	-3.20-38	1.11-37	3.24-37	6.07-37	9.70-37	1.43-36	1.99-36
40	8.16-34	3.11-38	8.93-39	-2.53-38	-8.66-38	-1.52-37	-1.56-37	-5.46-38	1.55-37	4.71-37	9.02-37	1.47-36	2.19-36	3.10-36
35	1.22-33	4.66-38	1.32-38	-3.92-38	-1.35-37	-2.40-37	-2.53-37	-1.03-37	2.21-37	7.26-37	1.43-36	2.39-36	3.65-36	5.31-36
30	1.95-33	7.45-38	2.07-38	-6.59-38	-2.28-37	-4.16-37	-4.57-37	-2.25-37	3.18-37	1.21-36	2.51-36	4.36-36	6.94-36	1.06-35
29	2.16-33	8.27-38	2.29-38	-7.40-38	-2.57-37	-4.71-37	-5.23-37	-2.69-37	3.40-37	1.35-36	2.85-36	5.01-36	8.08-36	1.25-35
28	2.40-33	9.20-38	2.53-38	-8.36-38	-2.90-37	-5.36-37	-6.03-37	-3.24-37	3.62-37	1.52-36	3.27-36	5.82-36	9.50-36	1.49-35
27	2.68-33	1.03-37	2.81-38	-9.50-38	-3.31-37	-6.15-37	-7.01-37	-3.95-37	3.83-37	1.72-36	3.76-36	6.81-36	1.13-35	1.80-35
26	3.01-33	1.16-37	3.13-38	-1.09-37	-3.79-37	-7.10-37	-8.22-37	-4.86-37	3.98-37	1.95-36	4.37-36	8.06-36	1.36-35	2.21-35
25	3.39-33	1.30-37	3.51-38	-1.25-37	-4.37-37	-8.27-37	-9.73-37	-6.06-37	4.06-37	2.22-36	5.13-36	9.66-36	1.67-35	2.78-35
24	3.84-33	1.48-37	3.94-38	-1.45-37	-5.09-37	-9.72-37	-1.17-36	-7.66-37	3.98-37	2.55-36	6.08-36	1.17-35	2.08-35	3.58-35
23	4.37-33	1.69-37	4.44-38	-1.69-37	-5.97-37	-1.15-36	-1.41-36	-9.84-37	3.62-37	2.93-36	7.30-36	1.45-35	2.66-35	4.74-35
22	5.01-33	1.94-37	5.04-38	-2.00-37	-7.08-37	-1.39-36	-1.74-36	-1.28-36	2.80-37	3.39-36	8.90-36	1.84-35	3.51-35	6.55-35
21	5.78-33	2.24-37	5.74-38	-2.38-37	-8.49-37	-1.69-36	-2.17-36	-1.71-36	1.11-37	3.93-36	1.10-35	2.39-35	4.79-35	9.52-35
20	6.71-33	2.60-37	6.58-38	-2.87-37	-1.03-36	-2.09-36	-2.76-36	-2.33-36	-2.05-37	4.56-36	1.39-35	3.21-35	6.88-35	1.49-34
19	7.86-33	3.06-37	7.59-38	-3.51-37	-1.27-36	-2.63-36	-3.60-36	-3.27-36	-8.07-37	5.23-36	1.80-35	4.51-35	1.06-34	2.59-34
18	9.29-33	3.63-37	8.81-38	-4.35-37	-1.60-36	-3.38-36	-4.82-36	-4.74-36	-1.95-36	5.82-36	2.40-35	6.72-35	1.80-34	5.33-34
17	1.11-32	4.35-37	1.03-37	-5.49-37	-2.04-36	-4.45-36	-6.65-36	-7.14-36	-4.19-36	5.89-36	3.32-35	1.09-34	3.59-34	1.51-33
16	1.34-32	5.28-37	1.22-37	-7.06-37	-2.68-36	-6.04-36	-9.55-36	-1.13-35	-8.81-36	4.08-36	4.77-35	2.05-34	9.71-34	9.22-33
15	1.64-32	6.50-37	1.46-37	-9.29-37	-3.61-36	-8.51-36	-1.44-35	-1.90-35	-1.92-35	-4.45-36	7.12-35	5.01-34	5.57-33	
14	2.04-32	8.15-37	1.79-37	-1.25-36	-5.04-36	-1.26-35	-2.31-35	-3.48-35	-4.54-35	-4.06-35	9.64-35	2.39-33		
13	2.58-32	1.04-36	2.29-37	-1.74-36	-7.42-36	-1.96-35	-4.01-35	-7.17-35	-1.26-34	-2.35-34	-3.13-34			
12	3.33-32	1.37-36	3.00-37	-2.49-36	-1.12-35	-3.31-35	-7.83-35	-1.77-34	-4.79-34	-2.96-33				
11	4.41-32	1.86-36	4.38-37	-3.68-36	-1.83-35	-6.20-35	-1.83-34	-6.06-34	-3.94-33					
10	6.04-32	2.64-36	7.42-37	-5.57-36	-3.23-35	-1.36-34	-5.82-34	-4.51-33						
9	8.60-32	3.97-36	1.53-36	-8.39-36	-6.38-35	-3.95-34	-3.93-33							
8	1.29-31	6.48-36	3.85-36	-1.12-35	-1.51-34	-2.27-33								
7	2.08-31	1.18-35	1.13-35	-4.62-36	-5.67-34									
6	3.74-31	2.51-35	3.93-35	1.29-34										
5	8.00-31	7.00-35	2.31-34											
4	2.39-30	3.69-34												
3	1.76-29													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.82-36	2.38-36	3.05-36	3.86-36	4.84-36	6.03-36	7.46-36	9.21-36	1.13-35	1.39-35	1.71-35	2.10-35	2.58-35	3.18-35
45	2.69-36	3.56-36	4.62-36	5.94-36	7.57-36	9.60-36	1.21-35	1.53-35	1.92-35	2.42-35	3.05-35	3.87-35	4.92-35	6.32-35
40	4.27-36	5.75-36	7.62-36	1.00-35	1.31-35	1.71-35	2.22-35	2.90-35	3.79-35	4.99-35	6.61-35	8.86-35	1.20-34	1.66-34
35	7.51-36	1.04-35	1.43-35	1.95-35	2.66-35	3.64-35	5.01-35	6.96-35	9.81-35	1.41-34	2.07-34	3.15-34	4.98-34	8.38-34
30	1.57-35	2.30-35	3.36-35	4.93-35	7.33-35	1.11-34	1.73-34	2.81-34	4.79-34	8.84-34	1.82-33	4.51-33	1.55-32	1.20-31
29	1.88-35	2.80-35	4.17-35	6.27-35	9.58-35	1.51-34	2.45-34	4.22-34	7.81-34	1.62-33	4.02-33	1.39-32	1.06-31	
28	2.28-35	3.46-35	5.28-35	8.17-35	1.30-34	2.13-34	3.68-34	6.87-34	1.43-33	3.58-33	1.24-32	9.61-32		
27	2.81-35	4.37-35	6.87-35	1.10-34	1.83-34	3.19-34	5.97-34	1.25-33	3.14-33	1.10-32	8.50-32			
26	3.54-35	5.67-35	9.24-35	1.55-34	2.72-34	5.16-34	1.09-33	2.75-33	9.63-33	7.51-32				
25	4.58-35	7.60-35	1.29-34	2.30-34	4.39-34	9.35-34	2.37-33	8.37-33	6.53-32					
24	6.11-35	1.06-34	1.92-34	3.70-34	7.94-34	2.03-33	7.19-33	5.68-32						
23	8.49-35	1.57-34	3.07-34	6.66-34	1.72-33	6.15-33	4.82-32							
22	1.25-34	2.49-34	5.50-34	1.44-33	5.20-33	4.16-32								
21	1.97-34	4.43-34	1.18-33	4.30-33	3.47-32									
20	3.47-34	9.42-34	3.50-33	2.86-32										
19	7.27-34	2.77-33	2.30-32											
18	2.10-33	1.79-32												
17	1.33-32													

TABLE 9
Results for HeII

HE + TE = 3.00+03 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 3.660-12 4-3 RC = 1.140-12 4-3 EM = 4.833-24 2S RC = 8.296-13 2P RC = 2.830-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.06-04	2.87-04	1.64-04	1.08-04	7.67-05	5.72-05	4.41-05	3.48-05	2.81-05	2.30-05	1.91-05	1.60-05	1.36-05	1.16-05
45	9.20-04	3.75-04	2.16-04	1.43-04	1.02-04	7.66-05	5.93-05	4.71-05	3.82-05	3.14-05	2.61-05	2.20-05	1.87-05	1.61-05
40	1.26-03	5.16-04	2.98-04	1.98-04	1.42-04	1.07-04	8.35-05	6.66-05	5.41-05	4.46-05	3.73-05	3.15-05	2.68-05	2.31-05
35	1.83-03	7.51-04	4.36-04	2.91-04	2.10-04	1.59-04	1.24-04	9.91-05	8.08-05	6.69-05	5.60-05	4.74-05	4.05-05	3.49-05
30	2.83-03	1.16-03	6.79-04	4.56-04	3.30-04	2.51-04	1.97-04	1.58-04	1.29-04	1.07-04	9.03-05	7.67-05	6.57-05	5.67-05
29	3.11-03	1.28-03	7.49-04	5.03-04	3.65-04	2.78-04	2.18-04	1.75-04	1.44-04	1.19-04	1.00-04	8.53-05	7.31-05	6.32-05
28	3.43-03	1.42-03	8.29-04	5.58-04	4.05-04	3.08-04	2.42-04	1.95-04	1.60-04	1.33-04	1.12-04	9.53-05	8.18-05	7.07-05
27	3.81-03	1.57-03	9.21-04	6.21-04	4.51-04	3.44-04	2.71-04	2.18-04	1.79-04	1.49-04	1.26-04	1.07-04	9.19-05	7.95-05
26	4.24-03	1.75-03	1.03-03	6.94-04	5.05-04	3.86-04	3.04-04	2.45-04	2.01-04	1.68-04	1.42-04	1.21-04	1.04-04	8.98-05
25	4.73-03	1.96-03	1.15-03	7.79-04	5.68-04	4.34-04	3.43-04	2.77-04	2.28-04	1.90-04	1.61-04	1.37-04	1.18-04	1.02-04
24	5.31-03	2.21-03	1.30-03	8.79-04	6.42-04	4.92-04	3.89-04	3.15-04	2.59-04	2.17-04	1.83-04	1.56-04	1.35-04	1.17-04
23	5.99-03	2.49-03	1.47-03	9.97-04	7.30-04	5.60-04	4.43-04	3.60-04	2.97-04	2.48-04	2.10-04	1.80-04	1.55-04	1.34-04
22	6.79-03	2.83-03	1.67-03	1.14-03	8.35-04	6.42-04	5.09-04	4.14-04	3.42-04	2.87-04	2.43-04	2.08-04	1.80-04	1.56-04
21	7.75-03	3.24-03	1.92-03	1.31-03	9.62-04	7.41-04	5.90-04	4.80-04	3.98-04	3.34-04	2.84-04	2.44-04	2.10-04	1.82-04
20	8.90-03	3.72-03	2.21-03	1.51-03	1.12-03	8.63-04	6.88-04	5.61-04	4.66-04	3.93-04	3.35-04	2.87-04	2.48-04	2.15-04
19	1.03-02	4.32-03	2.57-03	1.77-03	1.31-03	1.01-03	8.10-04	6.63-04	5.53-04	4.67-04	3.98-04	3.43-04	2.96-04	2.56-04
18	1.20-02	5.04-03	3.02-03	2.08-03	1.55-03	1.20-03	9.65-04	7.93-04	6.63-04	5.61-04	4.80-04	4.13-04	3.57-04	3.06-04
17	1.41-02	5.95-03	3.58-03	2.48-03	1.85-03	1.44-03	1.16-03	9.60-04	8.05-04	6.84-04	5.87-04	5.05-04	4.34-04	3.64-04
16	1.67-02	7.10-03	4.29-03	2.98-03	2.24-03	1.76-03	1.42-03	1.18-03	9.94-04	8.48-04	7.29-04	6.25-04	5.26-04	4.06-04
15	2.01-02	8.57-03	5.21-03	3.65-03	2.75-03	2.17-03	1.77-03	1.48-03	1.25-03	1.07-03	9.19-04	7.76-04	6.01-04	
14	2.49-02	1.05-02	6.42-03	4.53-03	3.44-03	2.74-03	2.25-03	1.89-03	1.61-03	1.38-03	1.17-03	9.13-04		
13	3.03-02	1.31-02	8.06-03	5.74-03	4.40-03	3.54-03	2.93-03	2.48-03	2.13-03	1.81-03	1.43-03			
12	3.81-02	1.66-02	1.03-02	7.45-03	5.78-03	4.70-03	3.95-03	3.37-03	2.88-03	2.30-03				
11	4.91-02	2.16-02	1.36-02	9.97-03	7.86-03	6.49-03	5.53-03	4.75-03	3.84-03					
10	6.49-02	2.89-02	1.86-02	1.39-02	1.12-02	9.41-03	8.13-03	6.70-03						
9	8.88-02	4.03-02	2.65-02	2.03-02	1.68-02	1.46-02	1.23-02							
8	1.27-01	5.90-02	4.62-02	3.20-02	2.76-02	2.39-02								
7	1.92-01	9.27-02	6.65-02	5.62-02	5.01-02									
6	3.17-01	1.62-01	1.27-01	1.16-01										
5	5.95-01	3.39-01	3.06-01											
4	1.40+00	1.00+00												
3	5.42+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.00-05	8.70-06	7.59-06	6.67-06	5.88-06	5.22-06	4.64-06	4.15-06	3.72-06	3.35-06	3.02-06	2.73-06	2.48-06	2.25-06
45	1.39-05	1.21-05	1.05-05	9.28-06	8.19-06	7.27-06	6.48-06	5.79-06	5.19-06	4.67-06	4.21-06	3.81-06	3.45-06	3.14-06
40	2.00-05	1.74-05	1.52-05	1.34-05	1.19-05	1.05-05	9.38-06	8.38-06	7.52-06	6.76-06	6.09-06	5.50-06	4.97-06	4.50-06
35	3.03-05	2.64-05	2.31-05	2.04-05	1.80-05	1.60-05	1.43-05	1.27-05	1.14-05	1.02-05	9.19-06	8.25-06	7.41-06	6.65-06
30	4.93-05	4.30-05	3.78-05	3.33-05	2.94-05	2.61-05	2.32-05	2.06-05	1.83-05	1.62-05	1.43-05	1.24-05	1.06-05	8.29-06
29	5.49-05	4.80-05	4.21-05	3.71-05	3.28-05	2.91-05	2.58-05	2.28-05	2.02-05	1.78-05	1.54-05	1.31-05	1.02-05	
28	6.15-05	5.37-05	4.72-05	4.16-05	3.67-05	3.25-05	2.87-05	2.53-05	2.22-05	1.93-05	1.63-05	1.27-05		
27	6.91-05	6.04-05	5.31-05	4.67-05	4.12-05	3.64-05	3.20-05	2.81-05	2.43-05	2.05-05	1.60-05			
26	7.82-05	6.83-05	6.00-05	5.28-05	4.65-05	4.08-05	3.57-05	3.09-05	2.60-05	2.02-05				
25	8.89-05	7.77-05	6.82-05	5.99-05	5.25-05	4.59-05	3.96-05	3.33-05	2.58-05					
24	1.02-04	8.89-05	7.78-05	6.82-05	5.94-05	5.13-05	4.30-05	3.32-05						
23	1.17-04	1.02-04	8.93-05	7.78-05	6.70-05	5.62-05	4.32-05							
22	1.36-04	1.18-04	1.03-04	8.85-05	7.42-05	5.70-05								
21	1.59-04	1.38-04	1.18-04	9.91-05	7.60-05									
20	1.86-04	1.60-04	1.34-04	1.03-04										
19	2.20-04	1.84-04	1.41-04											
18	2.57-04	1.97-04												
17	2.80-04													

HE + TE = 3.00+03 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	9.19-38	1.95-37	5.36-37	1.29-36	2.70-36	5.07-36	8.78-36	1.43-35	2.21-35	3.30-35	4.77-35	6.72-35	9.26-35
45	0.00+00	1.28-37	2.82-37	8.09-37	2.00-36	4.27-36	8.16-36	1.43-35	2.35-35	3.66-35	5.46-35	7.85-35	1.09-34	1.49-34
40	0.00+00	1.84-37	4.21-37	1.23-36	3.11-36	6.76-36	1.31-35	2.34-35	3.86-35	6.11-35	9.20-35	1.33-34	1.87-34	2.55-34
35	0.00+00	2.80-37	6.56-37	1.96-36	5.02-36	1.11-35	2.20-35	3.98-35	6.73-35	1.08-34	1.65-34	2.43-34	3.47-34	4.79-34
30	0.00+00	4.56-37	1.10-36	3.34-36	8.74-36	1.98-35	3.99-35	7.41-35	1.29-34	2.11-34	3.33-34	5.05-34	7.41-34	1.06-33
29	0.00+00	5.07-37	1.23-36	3.76-36	9.89-36	2.25-35	4.56-35	8.52-35	1.49-34	2.47-34	3.91-34	5.98-34	8.85-34	1.27-33
28	0.00+00	5.67-37	1.38-36	4.25-36	1.12-35	2.57-35	5.25-35	9.86-35	1.74-34	2.90-34	4.64-34	7.16-34	1.07-33	1.55-33
27	0.00+00	6.37-37	1.56-36	4.83-36	1.28-35	2.95-35	6.08-35	1.15-34	2.04-34	3.44-34	5.56-34	8.66-34	1.31-33	1.91-33
26	0.00+00	7.19-37	1.78-36	5.52-36	1.48-35	3.42-35	7.09-35	1.35-34	2.42-34	4.13-34	6.74-34	1.06-33	1.62-33	2.40-33
25	0.00+00	8.15-37	2.03-36	6.35-36	1.71-35	3.99-35	8.34-35	1.61-34	2.91-34	5.01-34	8.28-34	1.32-33	2.05-33	3.07-33
24	0.00+00	9.29-37	2.34-36	7.35-36	2.00-35	4.69-35	9.91-35	1.93-34	3.53-34	6.16-34	1.03-33	1.68-33	2.68-33	4.02-33
23	0.00+00	1.07-36	2.70-36	8.57-36	2.35-35	5.58-35	1.19-34	2.35-34	4.35-34	7.71-34	1.32-33	2.17-33	3.49-33	5.38-33
22	0.00+00	1.23-36	3.15-36	1.01-35	2.79-35	6.70-35	1.45-34	2.89-34	5.46-34	9.84-34	1.71-33	2.69-33	4.73-33	7.41-33
21	0.00+00	1.43-36	3.76-36	1.20-35	3.35-35	8.14-35	1.78-34	3.61-34	6.77-34	1.28-33	2.29-33	3.96-33	6.64-33	1.05-32
20	0.00+00	1.68-36	4.39-36	1.44-35	4.07-35	1.00-34	2.24-34	4.64-34	9.12-34	1.72-33	3.16-33	5.64-33	9.70-33	1.53-32
19	0.00+00	1.98-36	5.27-36	1.74-35	5.01-35	1.26-34	2.86-34	6.08-34	1.23-33	2.39-33	4.54-33	8.41-33	1.48-32	2.16-32
18	0.00+00	2.37-36	6.39-36	2.15-35	6.28-35	1.61-34	3.79-34	8.19-34	1.71-33	3.47-33	6.89-33	1.33-32	2.34-32	2.10-32
17	0.00+00	2.86-36	7.85-36	2.69-35	8.03-35	2.11-34	5.06-34	1.19-33	2.50-33	5.32-33	1.12-32	2.25-32	3.48-32	-1.09-31
16	0.00+00	3.50-36	9.80-36	3.43-35	1.05-34	2.85-34	7.09-34	1.68-33	3.86-33	8.79-33	1.98-32	4.01-32	-9.20-33	-3.77-30
15	0.00+00	4.35-36	1.25-35	4.48-35	1.41-34	3.98-34	1.04-33	2.61-33	6.47-33	1.61-32	3.91-32	5.18-32	-2.24-30	
14	0.00+00	5.49-36	1.62-35	6.01-35	1.98-34	5.84-34	1.62-33	4.42-33	1.21-32	3.40-32	8.15-32	-1.10-30		
13	0.00+00	7.09-36	2.16-35	8.35-35	2.89-34	9.12-34	2.76-33	8.42-33	2.69-32	8.78-32	-3.22-31			
12	0.00+00	9.37-36	2.98-35	1.22-34	4.50-34	1.55-33	5.33-33	1.93-32	7.85-32	1.40-31				
11	0.00+00	1.28-35	4.29-35	1.88-34	7.64-34	3.01-33	1.29-32	6.11-32	3.49-31					
10	0.00+00	1.81-35	6.53-35	3.16-34	1.48-33	7.15-33	4.16-32	3.79-31						
9	0.00+00	2.69-35	1.08-34	6.01-34	3.50-33	2.46-32	3.07-31							
8	0.00+00	4.30-35	1.99-34	1.40-33	1.21-32	1.99-31								
7	0.00+00	7.60-35	4.46-34	4.78-33	1.03-31									
6	0.00+00	1.58-34	1.43-33	4.03-32										
5	0.00+00	4.47-34	1.12-32											
4	0.00+00	2.70-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.25-34	1.67-34	2.20-34	2.86-34	3.68-34	4.70-34	5.96-34	7.50-34	9.40-34	1.17-33	1.45-33	1.80-33	2.22-33	2.73-33
45	1.98-34	2.57-34	3.29-34	4.13-34	5.09-34	6.17-34	7.35-34	8.56-34	9.72-34	1.07-33	1.12-33	1.08-33	8.79-34	4.19-34
40	3.38-34	4.37-34	5.52-34	6.80-34	8.12-34	9.34-34	1.02-33	1.01-33	8.77-34	4.38-4	-5.12-34	-2.35-33	-5.75-33	-1.19-32
35	6.44-34	8.41-34	1.07-33	1.30-33	1.50-33	1.59-33	1.42-33	6.73-34	-1.23-33	-5.46-33	-1.44-32	-3.29-32	-7.22-32	-1.59-31
30	1.46-33	1.94-33	2.47-33	2.92-33	2.97-33	1.84-33	-2.39-33	-1.05-32	-4.72-32	-1.38-31	-4.12-31	-1.00-30	-6.33-30	-6.09-29
29	1.77-33	2.37-33	3.00-33	3.48-33	3.23-33	8.15-34	-7.53-33	-3.22-32	-1.04-31	-3.32-31	-1.18-30	-5.94-30	-5.52-29	
28	2.17-33	2.92-33	3.68-33	4.10-33	3.15-33	-2.05-33	-1.98-32	-7.56-32	-2.61-31	-9.75-31	-4.79-30	-4.97-29		
27	2.71-33	3.65-33	4.54-33	4.71-33	2.06-33	-9.73-33	-5.12-32	-1.98-31	-7.91-31	-4.08-30	-4.43-29			
26	3.43-33	4.62-33	5.60-33	4.94-33	-2.00-33	-3.12-32	-1.44-31	-6.26-31	-3.43-30	-3.91-29				
25	4.42-33	5.93-33	6.74-33	3.65-33	-1.53-32	-9.83-32	-4.81-31	-2.83-30	-3.42-29					
24	5.82-33	7.64-33	7.45-33	-3.22-33	-6.12-32	-3.56-31	-2.28-30	-2.95-29						
23	7.80-33	9.67-33	5.42-33	-3.18-32	-2.50-3	-1.80-30	-2.51-29							
22	1.06-32	1.11-32	-9.68-33	-1.63-31	-1.37-30	-2.30-29								
21	1.42-32	6.03-33	-9.40-32	-1.01-30	-1.72-29									
20	1.0 -32	-4.14-32	-6.99-31	-1.38-29										
19	-3.71-33	-4.49-31	-1.07-29											
18	-2.94-31	-8.02-30												
17	-5.69-30													

HE + TE = 3.00+03 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 3.681-12 4-3 RC = 1.138-12 4-3 EM = 4.825-24 2S RC = 8.373-13 2P RC = 2.844-12

NU \ NI	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.15-03	4.42-04	2.32-04	1.42-04	9.46-05	6.70-05	4.94-05	3.77-05	2.95-05	2.36-05	1.92-05	1.58-05	1.32-05	1.12-05
45	1.22-03	4.90-04	2.71-04	1.72-04	1.18-04	8.57-05	6.45-05	5.00-05	3.96-05	3.20-05	2.63-05	2.18-05	1.84-05	1.56-05
40	1.46-03	5.94-04	3.38-04	2.21-04	1.56-04	1.15-04	8.81-05	6.92-05	5.55-05	4.52-05	3.74-05	3.13-05	2.65-05	2.26-05
35	1.96-03	8.02-04	4.63-04	3.07-04	2.20-04	1.65-04	1.28-04	1.01-04	8.19-05	6.73-05	5.60-05	4.72-05	4.01-05	3.43-05
30	2.92-03	1.20-03	6.99-04	4.68-04	3.38-04	2.56-04	2.00-04	1.60-04	1.30-04	1.08-04	9.00-05	7.61-05	6.50-05	5.58-05
29	3.20-03	1.32-03	7.69-04	5.16-04	3.73-04	2.82-04	2.21-04	1.77-04	1.44-04	[illegible]	1.00-04	8.47-05	7.23-05	6.22-05
28	3.52-03	1.45-03	8.48-04	5.70-04	4.13-04	3.13-04	2.45-04	1.97-04	1.61-04	1.33-04	1.12-04	9.46-05	8.08-05	6.96-05
27	3.89-03	1.61-03	9.40-04	6.33-04	4.59-04	3.49-04	2.74-04	2.20-04	1.80-04	1.49-04	1.25-04	1.06-04	9.08-05	7.82-05
26	4.32-03	1.79-03	1.05-03	7.06-04	5.13-04	3.90-04	3.07-04	2.47-04	2.02-04	1.68-04	1.41-04	1.20-04	1.02-04	8.83-05
25	4.82-03	2.00-03	1.17-03	7.92-04	5.76-04	4.39-04	3.46-04	2.78-04	2.28-04	1.90-04	1.60-04	1.36-04	1.16-04	1.00-04
24	5.40-03	2.24-03	1.32-03	8.92-04	6.51-04	4.97-04	3.92-04	3.16-04	2.60-04	2.16-04	1.82-04	1.55-04	1.33-04	1.15-04
23	6.09-03	2.53-03	1.49-03	1.01-03	7.39-04	5.66-04	4.47-04	3.61-04	2.97-04	2.48-04	2.09-04	1.78-04	1.53-04	1.32-04
22	6.90-03	2.87-03	1.70-03	1.15-03	8.45-04	6.48-04	5.13-04	4.15-04	3.42-04	2.86-04	2.42-04	2.06-04	1.77-04	1.53-04
21	7.86-03	3.28-03	1.94-03	1.32-03	9.72-04	7.48-04	5.93-04	4.81-04	3.97-04	3.33-04	2.82-04	2.40-04	2.07-04	1.79-04
20	9.02-03	3.77-03	2.24-03	1.53-03	1.13-03	8.70-04	6.92-04	5.63-04	4.66-04	3.91-04	3.31-04	2.83-04	2.44-04	2.10-04
19	1.04-02	4.37-03	2.61-03	1.79-03	1.32-03	1.02-03	8.14-04	6.64-04	5.51-04	4.64-04	3.94-04	3.37-04	2.90-04	2.50-04
18	1.21-02	5.11-03	3.06-03	2.10-03	1.56-03	1.21-03	9.69-04	7.93-04	6.60-04	5.57-04	4.74-04	4.06-04	3.49-04	2.99-04
17	1.43-02	6.03-03	3.62-03	2.50-03	1.86-03	1.45-03	1.17-03	9.60-04	8.02-04	6.78-04	5.78-04	4.95-04	4.23-04	3.56-04
16	1.69-02	7.19-03	4.34-03	3.02-03	2.26-03	1.77-03	1.43-03	1.18-03	9.88-04	8.38-04	7.16-04	6.11-04	5.14-04	4.04-04
15	2.04-02	8.68-03	5.27-03	3.68-03	2.77-03	2.19-03	1.78-03	1.47-03	1.24-03	1.06-03	9.00-04	7.58-04	5.97-04	
14	2.48-02	1.06-02	6.50-03	4.58-03	3.47-03	2.75-03	2.25-03	1.88-03	1.59-03	1.36-03	1.14-03	9.04-04		
13	3.06-02	1.32-02	8.16-03	5.80-03	4.44-03	3.55-03	2.93-03	2.47-03	2.10-03	1.77-03	1.41-03			
12	3.86-02	1.68-02	1.05-02	7.52-03	5.82-03	4.72-03	3.93-03	3.34-03	2.83-03	2.26-03				
11	4.97-02	2.18-02	1.38-02	1.01-02	7.90-03	6.50-03	5.42-03	4.67-03	3.78-03					
10	6.57-02	2.93-02	1.88-02	1.40-02	1.12-02	9.39-03	8.03-03	6.59-03						
9	8.99-02	4.08-02	2.68-02	2.04-02	1.68-02	1.44-02	1.21-02							
8	1.28-01	5.97-02	4.06-02	3.21-02	2.75-02	2.36-02								
7	1.95-01	9.38-02	6.71-02	5.63-02	4.96-02									
6	3.21-01	1.64-01	1.27-01	1.15-01										
5	6.01-01	3.41-01	3.05-01											
4	1.41+00	1.00+00												
3	5.44+00													

NU \ NI	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	9.51-06	8.18-06	7.08-06	6.17-06	5.42-06	4.78-06	4.23-06	3.77-06	3.37-06	3.03-06	2.73-06	2.46-06	2.23-06	2.03-06
45	1.33-05	1.15-05	1.00-05	8.75-06	7.70-06	6.80-06	6.04-06	5.39-06	4.82-06	4.33-06	3.91-06	3.53-06	3.20-06	2.91-06
40	1.94-05	1.68-05	1.47-05	1.29-05	1.13-05	1.00-05	8.91-06	7.95-06	7.12-06	6.40-06	5.77-06	5.21-06	4.72-06	4.28-06
35	2.96-05	2.57-05	2.25-05	1.98-05	1.74-05	1.54-05	1.37-05	1.22-05	1.10-05	9.83-06	8.84-06	7.96-06	7.17-06	6.47-06
30	4.83-05	4.21-05	3.68-05	3.24-05	2.86-05	2.53-05	2.24-05	1.99-05	1.77-05	1.58-05	1.40-05	1.24-05	1.07-05	8.70-06
29	5.39-05	4.69-05	4.11-05	3.61-05	3.18-05	2.82-05	2.50-05	2.21-05	1.96-05	1.74-05	1.53-05	1.32-05	1.07-05	
28	6.03-05	5.25-05	4.60-05	4.04-05	3.56-05	3.15-05	2.78-05	2.46-05	2.17-05	1.91-05	1.64-05	1.33-05		
27	6.78-05	5.91-05	5.17-05	4.54-05	4.00-05	3.53-05	3.11-05	2.74-05	2.40-05	2.06-05	1.66-05			
26	7.66-05	6.68-05	5.84-05	5.13-05	4.51-05	3.97-05	3.48-05	3.04-05	2.60-05	2.09-05				
25	8.70-05	7.58-05	6.63-05	5.81-05	5.10-05	4.47-05	3.89-05	3.32-05	2.66-05					
24	9.95-05	8.67-05	7.57-05	6.62-05	5.78-05	5.02-05	4.28-05	3.41-05						
23	1.14-04	9.96-05	8.69-05	7.56-05	6.55-05	5.56-05	4.43-05							
22	1.33-04	1.15-04	1.00-04	8.64-05	7.32-05	5.81-05								
21	1.55-04	1.34-04	1.15-04	9.76-05	7.73-05									
20	1.82-04	1.56-04	1.32-04	1.04-04										
19	2.14-04	1.81-04	1.42-04											
18	2.51-04	1.98-04												
17	2.80-04													

HE + TE = 3.00+03 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NI	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	6.57-38	4.17-38	3.62-39	-9.16-38	-2.51-37	-3.76-37	-1.79-37	9.33-37	4.00-36	1.07-35	2.35-35	4.61-35	8.36-35
45	0.00+00	1.16-37	1.85-37	4.15-37	8.87-37	1.74-36	3.25-36	5.88-36	1.04-35	1.81-35	3.08-35	5.12-35	8.34-35	1.33-34
40	0.00+00	1.82-37	3.67-37	9.70-37	2.29-36	4.75-36	8.97-36	1.58-35	2.65-35	4.26-35	6.66-35	1.02-34	1.52-34	2.25-34
35	0.00+00	2.82-37	6.28-37	1.79-36	4.44-36	9.57-36	1.85-35	3.31-35	5.56-35	8.88-35	1.37-34	2.04-34	2.97-34	4.23-34
30	0.00+00	4.59-37	1.08-36	3.21-36	8.26-36	1.84-35	3.67-35	6.73-35	1.16-34	1.88-34	2.95-34	4.46-34	6.55-34	9.40-34
29	0.00+00	5.11-37	1.21-36	3.63-36	9.41-36	2.11-35	4.23-35	7.81-35	1.35-34	2.22-34	3.49-34	5.31-34	7.86-34	1.13-33
28	0.00+00	5.71-37	1.36-36	4.12-36	1.08-35	2.43-35	4.91-35	9.12-35	1.59-34	2.63-34	4.17-34	6.39-34	9.53-34	1.38-33
27	0.00+00	6.41-37	1.55-36	4.70-36	1.23-35	2.81-35	5.72-35	1.07-34	1.88-34	3.14-34	5.02-34	7.77-34	1.17-33	1.72-33
26	0.00+00	7.23-37	1.76-36	5.38-36	1.42-35	3.26-35	6.70-35	1.27-34	2.24-34	3.78-34	6.11-34	9.57-34	1.46-33	2.16-33
25	0.00+00	8.19-37	2.01-36	6.20-36	1.65-35	3.82-35	7.92-35	1.51-34	2.70-34	4.61-34	7.54-34	1.20-33	1.84-33	2.77-33
24	0.00+00	9.34-37	2.31-36	7.19-36	1.93-35	4.51-35	9.43-35	1.82-34	3.29-34	5.69-34	9.45-34	1.52-33	2.38-33	3.65-33
23	0.00+00	1.07-36	2.68-36	8.40-36	2.28-35	5.37-35	1.14-34	2.22-34	4.07-34	7.13-34	1.20-33	1.97-33	3.16-33	4.92-33
22	0.00+00	1.24-36	3.12-36	9.90-36	2.71-35	6.46-35	1.38-34	2.74-34	5.11-34	9.11-34	1.57-33	2.63-33	4.31-33	6.87-33
21	0.00+00	1.44-36	3.68-36	1.18-35	3.26-35	7.86-35	1.71-34	3.44-34	6.54-34	1.19-33	2.10-33	3.62-33	6.09-33	9.96-33
20	0.00+00	1.68-36	4.36-36	1.41-35	3.97-35	9.71-35	2.14-34	4.40-34	8.56-34	1.60-33	2.91-33	5.17-33	9.01-33	1.51-32
19	0.00+00	1.99-36	5.23-36	1.72-35	4.89-35	1.22-34	2.75-34	5.77-34	1.15-33	2.22-33	4.19-33	7.76-33	1.41-32	2.41-32
18	0.00+00	2.38-36	6.34-36	2.11-35	6.13-35	1.56-34	3.60-34	7.78-34	1.61-33	3.23-33	6.37-33	1.24-32	2.36-32	3.83-32
17	0.00+00	2.88-36	7.80-36	2.65-35	7.84-35	2.04-34	4.86-34	1.09-33	2.34-33	4.95-33	1.04-32	2.17-32	4.24-32	2.93-32
16	0.00+00	3.52-36	9.74-36	3.38-35	1.03-34	2.76-34	6.80-34	1.59-33	3.63-33	8.20-33	1.87-32	4.21-32	6.77-32	-1.15-30
15	0.00+00	4.37-36	1.24-35	4.41-35	1.38-34	3.86-34	9.97-34	2.48-33	6.07-33	1.51-32	3.84-32	8.90-32	-5.80-31	
14	0.00+00	5.52-36	1.61-35	5.92-35	1.93-34	5.66-34	1.56-33	4.18-33	1.14-32	3.25-32	9.55-32	-1.35-31		
13	0.00+00	7.12-36	2.15-35	8.23-35	2.82-34	8.81-34	2.64-33	7.97-33	2.55-32	9.01-32	1.76-31			
12	0.00+00	9.42-36	2.96-35	1.20-34	4.39-34	1.50-33	5.09-33	1.83-32	7.64-32	3.55-31				
11	0.00+00	1.28-35	4.26-35	1.85-34	7.45-34	2.90-33	1.19-32	5.83-32	4.16-31					
10	0.00+00	1.82-35	6.49-35	3.11-34	1.44-33	6.88-33	2.96-32	3.84-31						
9	0.00+00	2.71-35	1.07-34	5.91-34	3.40-33	2.35-32	2.96-31							
8	0.00+00	4.32-35	1.98-34	1.38-33	1.17-32	1.90-31								
7	0.00+00	7.64-35	4.43-34	4.68-33	9.88-32									
6	0.00+00	1.59-34	1.42-33	3.92-32										
5	0.00+00	4.48-34	1.10-32											
4	0.00+00	2.70-33												
3	0.00+00													

NU \ NI	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.43-34	2.34-34	3.71-34	5.69-34	8.54-34	1.26-33	1.87-33	2.59-33	3.66-33	5.11-33	7.08-33	9.76-33	1.34-32	1.83-32
45	2.08-34	3.18-34	4.79-34	7.12-34	1.04-33	1.51-33	2.17-33	3.10-33	4.38-33	6.18-33	8.68-33	1.22-32	1.71-32	2.40-32
40	3.27-34	4.72-34	6.76-34	9.62-34	1.36-33	1.91-33	2.72-33	3.83-33	5.41-33	7.67-33	1.09-32	1.57-32	2.27-32	3.32-32
35	5.04-34	8.23-34	1.13-33	1.54-33	2.08-33	2.82-33	3.80-33	5.14-33	6.97-33	9.50-33	1.30-32	1.80-32	2.52-32	3.55-32
30	1.12-33	1.82-33	2.45-33	3.23-33	4.13-33	5.02-33	5.53-33	4.60-33	-7.55-34	-1.94-32	-8.13-32	-3.10-31	-1.43-30	-1.30-29
29	1.60-33	2.21-33	2.98-33	3.90-33	4.88-33	5.59-33	5.09-33	6.50-34	-1.61-32	-7.38-32	-2.93-31	-1.19-30	-1.30-29	
28	1.97-33	2.73-33	3.68-33	4.77-33	5.76-33	5.88-33	2.75-33	-1.11-32	-6.20-32	-2.63-31	-1.30-30	-1.27-29		
27	2.66-33	3.43-33	4.62-33	5.90-33	6.68-33	[illegible]	-5.38-33	-4.79-32	-2.25-31	-1.18-[illegible]	-1.20-29			
26	3.13-33	4.39-33	5.91-33	7.31-33	7.15-33	[illegible]	-3.31-32	-1.83-31	-1.15-30	-1.11				
25	4.06-33	5.75-33	7.67-33	8.85-33	5.17-33	-1.89-32	-1.41-31	-8.82-31	-1.01-29					
24	5.42-33	7.71-33	1.00-32	9.55-33	-6.17-33	-1.01-31	-7.27-31	-8.96-30						
23	7.43-33	1.05-32	1.26-32	4.59-33	-6.45-32	-5.76-31	-7.82-30							
22	1.05-32	1.46-32	1.30-32	-3.26-32	-4.36-31	-6.68-30								
21	1.53-32	1.90-32	-6.14-33	-3.08-31	-5.58-30									
20	2.32-32	1.45-32	-1.97-31	-4.53-30										
19	2.92-32	-1.01-31	-1.55-30											
18	-2.13-32	-2.65-30												
17	-1.85-30													

HE + TE = 3.00+03 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 3.721-12 4-3 RC = 1.126-12 4-3 EM = 4.772-24 2S RC = 8.552-13 2P RC = 2.866-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.77-03	8.94-04	4.03-04	2.18-04	1.32-04	8.62-05	5.98-05	4.32-05	3.24-05	2.49-05	1.96-05	1.57-05	1.28-05	1.06-05
45	2.95-03	9.91-04	4.63-04	2.58-04	1.60-04	1.07-04	7.56-05	5.56-05	4.22-05	3.28-05	2.61-05	2.11-05	1.73-05	1.44-05
40	2.97-03	1.07-03	5.32-04	3.11-04	2.00-04	1.38-04	9.98-05	7.48-05	5.77-05	4.55-05	3.67-05	3.00-05	2.49-05	2.09-05
35	3.02-03	1.18-03	6.33-04	3.91-04	2.64-04	1.88-04	1.40-04	1.07-04	8.42-05	6.75-05	5.50-05	4.55-05	3.81-05	3.22-05
30	3.56-03	1.46-03	8.26-04	5.38-04	3.77-04	2.[illegible]-04	2.12-04	1.66-04	1.32-04	1.08-04	8.88-05	7.41-05	6.25-05	5.32-05
29	3.79-03	1.55-03	8.87-04	5.81-04	4.10-04	3.04-04	2.33-04	1.83-04	1.47-04	1.19-04	9.87-05	8.25-05	6.97-05	5.94-05
28	4.06-03	1.67-03	9.59-04	6.32-04	4.49-04	3.34-04	2.57-04	2.02-04	1.63-04	1.33-04	1.10-04	9.22-05	7.80-05	6.65-05
27	4.39-03	1.81-03	1.04-03	6.92-04	4.94-04	3.69-04	2.85-04	2.25-04	1.82-04	1.49-04	1.23-04	1.04-04	8.77-05	7.48-05
26	4.79-03	1.97-03	1.14-03	7.63-04	5.47-04	4.10-04	3.18-04	2.52-04	2.04-04	1.67-04	1.39-04	1.17-04	9.90-05	8.46-05
25	5.26-03	2.17-03	1.26-03	8.46-04	6.09-04	4.59-04	3.57-04	2.84-04	2.30-04	1.89-04	1.58-04	1.32-04	1.12-04	9.61-05
24	5.83-03	2.41-03	1.41-03	9.45-04	6.83-04	5.16-04	4.02-04	3.21-04	2.61-04	2.15-04	1.79-04	1.51-04	1.28-04	1.10-04
23	6.50-03	2.69-03	1.58-03	1.06-03	7.71-04	5.85-04	4.57-04	3.66-04	2.98-04	2.46-04	2.06-04	1.73-04	1.47-04	1.26-04
22	7.31-03	3.04-03	1.79-03	1.21-03	8.77-04	6.67-04	5.23-04	4.20-04	3.43-04	2.84-04	2.37-04	2.00-04	1.71-04	1.46-04
21	8.28-03	3.45-03	2.03-03	1.38-03	1.01-03	7.68-04	6.04-04	4.86-04	3.97-04	3.29-04	2.76-04	2.33-04	1.99-04	1.70-04
20	9.45-03	3.95-03	2.34-03	1.59-03	1.16-03	8.91-04	7.03-04	5.67-04	4.65-04	3.86-04	3.24-04	2.74-04	2.33-04	2.00-04
19	1.09-02	4.56-03	2.71-03	1.85-03	1.36-03	1.04-03	8.26-04	6.68-04	5.49-04	4.57-04	3.84-04	3.25-04	2.77-04	2.36-04
18	1.26-02	5.32-03	3.17-03	2.17-03	1.60-03	1.24-03	9.81-04	7.96-04	6.56-04	5.47-04	4.61-04	3.90-04	3.31-04	2.80-04
17	1.48-02	6.26-03	3.75-03	2.58-03	1.91-03	1.48-03	1.18-03	9.61-04	7.94-04	6.64-04	5.59-04	4.73-04	3.99-04	3.32-04
16	1.76-02	7.46-03	4.49-03	3.11-03	2.31-03	1.80-03	1.44-03	1.18-03	9.76-04	8.18-04	6.89-04	5.80-04	4.81-04	3.76-04
15	2.11-02	8.99-03	5.44-03	3.79-03	2.84-03	2.22-03	1.79-03	1.47-03	1.22-03	1.02-03	8.59-04	7.12-04	5.55-04	
14	2.57-02	1.10-02	6.71-03	4.70-03	3.55-03	2.79-03	2.26-03	1.86-03	1.56-03	1.30-03	1.08-03	8.42-04		
13	3.17-02	1.37-02	8.41-03	5.95-03	4.53-03	3.59-03	2.93-03	2.43-03	2.03-03	1.68-03	1.32-03			
12	4.00-02	1.74-02	1.08-02	7.72-03	5.93-03	4.75-03	3.91-03	3.26-03	2.71-03	2.12-03				
11	5.14-02	2.26-02	1.42-02	1.03-02	8.02-03	6.51-03	5.41-03	4.51-03	3.56-03					
10	6.80-02	3.03-02	1.94-02	1.43-02	1.13-02	9.34-03	7.81-03	6.24-03						
9	9.30-02	4.21-02	2.76-02	2.08-02	1.69-02	1.42-02	1.15-02							
8	1.33-01	6.16-02	4.16-02	3.26-02	2.73-02	2.26-02								
7	2.01-01	9.67-02	6.86-02	5.64-02	4.80-02									
6	3.32-01	1.68-01	1.29-01	1.12-01										
5	6.21-01	3.49-01	3.02-01											
4	1.46+00	1.00+00												
3	5.52+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.84-06	7.47-06	6.37-06	5.48-06	4.75-06	4.14-06	3.64-06	3.21-06	2.85-06	2.54-06	2.27-06	2.04-06	1.84-06	1.67-06
45	1.21-05	1.03-05	8.84-06	7.64-06	6.65-06	5.82-06	5.13-06	4.54-06	4.04-06	3.61-06	3.24-06	2.92-06	2.64-06	2.39-06
40	1.77-05	1.51-05	1.30-05	1.13-05	9.89-06	8.69-06	7.68-06	6.82-06	6.08-06	5.45-06	4.89-06	4.41-06	3.99-06	3.62-06
35	2.74-05	2.36-05	2.04-05	1.78-05	1.56-05	1.38-05	1.22-05	1.08-05	9.67-06	8.66-06	7.77-06	7.00-06	6.31-06	5.69-06
30	4.56-05	3.94-05	3.42-05	2.99-05	2.62-05	2.31-05	2.04-05	1.81-05	1.61-05	1.43-05	1.27-05	1.12-05	9.75-06	7.99-06
29	5.09-05	4.40-05	3.83-05	3.34-05	2.93-05	2.58-05	2.28-05	2.02-05	1.79-05	1.58-05	1.39-05	1.21-05	9.85-06	
28	5.71-05	4.94-05	4.29-05	3.75-05	3.29-05	2.89-05	2.55-05	2.25-05	1.99-05	1.76-05	1.56-05	1.22-05		
27	6.43-05	5.56-05	4.84-05	4.22-05	3.70-05	3.25-05	2.86-05	2.51-05	2.19-05	1.89-05	1.53-05			
26	7.28-05	6.29-05	5.47-05	4.77-05	4.17-05	3.66-05	3.20-05	2.79-05	2.39-05	1.93-05				
25	8.27-05	7.15-05	6.21-05	5.41-05	4.72-05	4.12-05	3.58-05	3.[illegible]-05	2.46-05					
24	9.45-05	8.17-05	7.08-05	6.16-05	5.35-05	4.63-05	3.94-05	3.[illegible]-05						
23	1.09-04	9.37-05	8.11-05	7.02-05	6.05-05	5.16-05	4.10-05							
22	1.25-04	1.08-04	9.33-05	8.01-05	6.77-05	5.39-05								
21	1.46-04	1.25-04	1.07-04	9.03-05	7.16-05									
20	1.71-04	1.46-04	1.22-04	9.65-05										
19	2.00-04	1.68-04	1.32-04											
18	2.34-04	1.84-04												
17	2.60-04													

HE + TE = 3.00+03 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-6.61-38	-5.07-37	-1.57-36	-3.69-36	-7.28-36	-1.26-35	-1.95-35	-2.74-35	-3.48-35	-3.90-35	-3.57-35	-1.82-35	2.29-35
45	0.00+00	-1.80-38	-4.04-37	-1.33-36	-3.17-36	-6.26-36	-1.07-35	-1.61-35	-2.13-35	-2.40-35	-2.03-35	-3.77-36	3.51-35	1.10-34
40	0.00+00	7.75-38	-1.55-37	-6.94-37	-1.78-36	-3.56-36	-5.85-36	-7.90-36	-7.96-36	-2.80-36	1.31-35	4.84-35	1.17-34	2.38-34
35	0.00+00	2.29-37	2.66-37	4.53-37	8.42-37	1.68-36	3.62-36	8.04-36	1.75-35	3.64-35	7.21-35	1.36-34	2.48-34	4.34-34
30	0.00+00	4.49-37	8.81-37	2.29-36	5.40-36	1.14-35	2.21-35	4.05-35	7.09-35	1.20-34	2.00-34	3.26-34	5.27-34	8.44-34
29	0.00+00	5.07-37	1.04-36	2.78-36	6.68-36	1.42-35	2.78-35	5.07-35	8.84-35	1.49-34	2.44-34	3.93-34	6.26-34	9.90-34
28	0.00+00	5.71-37	1.21-36	3.33-36	8.14-36	1.76-35	3.44-35	6.30-35	1.09-34	1.83-34	2.98-34	4.76-34	7.51-34	1.19-33
27	0.00+00	6.45-37	1.41-36	3.96-36	9.83-36	2.14-35	4.23-35	7.78-35	1.35-34	2.26-34	3.67-34	5.82-34	9.13-34	1.42-33
26	0.00+00	7.29-37	1.63-36	4.68-36	1.18-35	2.60-35	5.18-35	9.58-35	1.67-34	2.80-34	4.54-34	7.21-34	1.13-33	1.74-33
25	0.00+00	8.28-37	1.90-36	5.52-36	1.41-35	3.15-35	6.34-35	1.18-34	2.07-34	3.49-34	5.68-34	9.04-34	1.41-33	2.19-33
24	0.00+00	9.44-37	2.20-36	6.52-36	1.69-35	3.81-35	7.76-35	1.46-34	2.59-34	4.39-34	7.20-34	1.15-33	1.81-33	2.81-33
23	0.00+00	1.08-36	2.57-36	7.71-36	2.02-35	4.63-35	9.54-35	1.82-34	3.26-34	5.58-34	9.26-34	1.50-33	2.37-33	3.71-33
22	0.00+00	1.25-36	3.01-36	9.17-36	2.44-35	5.66-35	1.18-34	2.28-34	4.14-34	7.21-34	1.21-33	1.99-33	3.20-33	5.06-33
21	0.00+00	1.45-36	3.56-36	1.10-35	2.96-35	6.97-35	1.48-34	2.89-34	5.36-34	9.49-34	1.63-33	2.72-33	4.47-33	7.17-33
20	0.00+00	1.70-36	4.23-36	1.33-35	3.63-35	8.67-35	1.87-34	3.74-34	7.06-34	1.28-33	2.25-33	3.87-33	6.51-33	1.06-32
19	0.00+00	2.01-36	5.08-36	1.62-35	4.50-35	1.10-34	2.41-34	4.92-34	9.54-34	1.78-33	3.23-33	5.75-33	1.00-32	1.69-32
18	0.00+00	2.40-36	6.18-36	2.00-35	5.67-35	1.41-34	3.17-34	6.66-34	1.33-33	2.58-33	4.88-33	9.09-33	1.64-32	2.54-32
17	0.00+00	2.90-36	7.60-36	2.51-35	7.27-35	1.85-34	4.29-34	9.32-34	1.94-33	3.93-33	7.87-33	1.55-32	2.85-32	2.05-32
16	0.00+00	3.55-36	9.50-36	3.21-35	9.53-35	2.50-34	6.01-34	1.36-33	2.99-33	6.45-33	1.39-32	2.93-32	4.41-32	-6.23-31
15	0.00+00	4.41-36	1.21-35	4.19-35	1.29-34	3.50-34	8.80-34	2.11-33	4.96-33	1.17-32	2.79-32	5.95-32	-3.28-31	
14	0.00+00	5.57-36	1.57-35	5.61-35	1.80-34	5.13-34	1.37-33	3.54-33	9.18-33	2.46-32	6.64-32	-7.96-32		
13	0.00+00	7.18-36	2.10-35	7.84-35	2.62-34	7.98-34	2.31-33	6.66-33	2.01-32	6.[illegible]-32	1.10-31			
12	0.00+00	9.50-36	2.90-35	1.14-34	4.08-34	1.35-33	4.41-33	1.50-32	5.80-32	2.35-31				
11	0.00+00	1.29-35	4.17-35	1.76-34	6.90-34	2.60-33	1.02-32	4.63-32	2.91-31					
10	0.00+00	1.83-35	6.34-35	2.95-34	1.32-33	6.08-33	3.29-32	2.86-31						
9	0.00+00	2.73-35	1.08-34	5.60-34	3.11-33	2.04-32	2.33-31							
8	0.00+00	4.36-35	1.93-34	1.30-33	1.06-32	1.58-31								
7	0.00+00	7.69-35	4.30-34	4.36-33	8.65-32									
6	0.00+00	1.60-34	1.37-33	3.59-32										
5	0.00+00	4.49-34	1.05-32											
4	0.00+00	2.69-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.01-34	2.35-34	4.50-34	7.80-34	1.27-33	1.98-33	3.00-33	4.43-33	6.41-33	9.13-33	1.28-32	1.79-32	2.47-32	3.39-32
45	2.43-34	4.60-34	8.04-34	1.33-33	2.11-33	3.27-33	4.93-33	7.32-33	1.07-32	1.55-32	2.23-32	3.19-32	4.56-32	6.47-32
40	4.63-34	7.74-34	1.30-33	2.10-33	3.33-33	5.17-33	7.92-33	1.20-32	1.81-32	2.71-32	4.06-32	6.09-32	9.20-32	1.40-31
35	7.81-34	1.23-33	2.02-33	3.26-33	5.21-33	8.27-33	1.31-32	2.07-32	3.30-32	5.31-32	8.68-32	1.45-31	2.51-31	4.54-31
30	1.35-33	2.15-33	3.45-33	5.56-33	9.07-33	1.50-32	2.50-32	4.44-32	8.10-32	1.57-31	3.37-31	8.50-31	2.93-30	2.21-29
29	1.56-33	2.48-33	3.99-33	6.37-33	1.04-32	1.75-32	3.02-32	5.65-32	1.06-31	2.21-31	5.48-31	1.85-30	1.36-29	
28	1.84-33	2.90-33	4.60-33	7.40-33	1.22-32	2.07-32	3.62-32	6.86-32	1.41-31	3.38-31	1.09-30	7.73-30		
27	2.21-33	3.48-33	5.44-33	8.74-33	1.44-32	2.47-32	4.46-32	8.72-32	1.96-31	5.78-31	3.67-30			
26	2.69-33	4.18-33	6.56-33	1.05-32	1.72-32	2.96-32	5.30-32	1.05-31	2.49-31	9.77-31				
25	3.37-33	5.20-33	8.09-33	1.27-32	2.08-32	3.56-32	6.32-32	1.26-31	-6.97-31					
24	4.33-33	6.64-33	1.01-32	1.59-32	2.58-32	4.38-32	7.71-32	-1.67-30						
23	5.72-33	8.70-33	1.27-32	1.63-32	7.09-33	-1.20-31	-2.14-30							
22	7.83-33	1.16-32	1.48-32	4.62-33	-1.29-31	-2.27-30								
21	1.11-32	1.51-32	8.05-33	-1.12-31	-2.18-30									
20	1.59-32	1.41-32	-8.11-32	-1.95-30										
19	2.01-32	-4.53-32	-1.64-30											
18	-1.01-32	-1.30-30												
17	-9.53-31													

HE + TE = 3.00+03 NE = 1.00+05 CASE B NC = 70

TOTAL RC = 3.797-12 4-3 RC = 1.107-12 4-3 EM = 4.691-24 2S RC = 8.887-13 2P RC = 2.908-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.43-03	1.37-03	5.92-04	3.09-04	1.81-04	1.15-04	7.80-05	5.52-05	4.05-05	3.07-05	2.37-05	1.88-05	1.51-05	1.23-05
45	5.20-03	1.61-03	7.03-04	3.68-04	2.17-04	1.39-04	9.44-05	6.71-05	4.94-05	3.75-05	2.91-05	2.31-05	1.86-05	1.52-05
40	6.19-03	1.95-03	8.60-04	4.57-04	2.72-04	1.76-04	1.20-04	8.62-05	6.40-05	4.88-05	3.81-05	3.04-05	2.46-05	2.02-05
35	7.13-03	2.32-03	1.06-03	5.76-04	3.52-04	2.32-04	1.61-04	1.17-04	8.81-05	6.80-05	5.37-05	4.32-05	3.52-05	2.92-05
30	7.99-03	2.67-03	1.30-03	7.46-04	4.75-04	3.24-04	2.33-04	1.73-04	1.33-04	1.05-04	8.37-05	6.82-05	5.63-05	4.71-05
29	7.62-03	2.74-03	1.36-03	7.92-04	5.10-04	3.51-04	2.54-04	1.90-04	1.46-04	1.16-04	9.29-05	7.59-05	6.28-05	5.27-05
28	7.65-03	2.82-03	1.42-03	8.43-04	5.49-04	3.82-04	2.78-04	2.09-04	1.62-04	1.28-04	1.04-04	8.49-05	7.05-05	5.92-05
27	7.71-03	2.91-03	1.50-03	9.02-04	5.95-04	4.17-04	3.06-04	2.32-04	1.81-04	1.44-04	1.16-04	9.55-05	7.95-05	6.68-05
26	7.80-03	3.01-03	1.59-03	9.71-04	6.48-04	4.59-04	3.39-04	2.59-04	2.02-04	1.62-04	1.31-04	1.08-04	9.01-05	7.59-05
25	7.97-03	3.14-03	1.69-03	1.05-03	7.10-04	5.08-04	3.78-04	2.90-04	2.28-04	1.83-04	1.49-04	1.23-04	1.03-04	8.66-05
24	8.24-03	3.31-03	1.82-03	1.15-03	7.83-04	5.65-04	4.24-04	3.27-04	2.58-04	2.08-04	1.70-04	1.41-04	1.18-04	9.93-05
23	8.65-03	3.52-03	1.96-03	1.26-03	8.70-04	6.34-04	4.78-04	3.71-04	2.95-04	2.38-04	1.95-04	1.62-04	1.36-04	1.15-04
22	9.23-03	3.79-03	2.15-03	1.39-03	9.75-04	7.16-04	5.44-04	4.25-04	3.39-04	2.74-04	2.25-04	1.87-04	1.57-04	1.33-04
21	1.00-02	4.14-03	2.37-03	1.56-03	1.10-03	8.16-04	6.24-04	4.90-04	3.92-04	3.19-04	2.62-04	2.19-04	1.84-04	1.55-04
20	1.11-02	4.58-03	2.66-03	1.76-03	1.26-03	9.38-04	7.23-04	5.70-04	4.58-04	3.73-04	3.08-04	2.57-04	2.16-04	1.82-04
19	1.24-02	5.16-03	3.02-03	2.02-03	1.45-03	1.09-03	8.45-04	6.69-04	5.40-04	4.41-04	3.65-04	3.04-04	2.55-04	2.15-04
18	1.41-02	5.89-03	3.47-03	2.34-03	1.70-03	1.28-03	9.98-04	7.95-04	6.43-04	5.27-04	4.36-04	3.64-04	3.05-04	2.55-04
17	1.63-02	6.84-03	4.06-03	2.75-03	2.01-03	1.53-03	1.20-03	9.55-04	7.76-04	6.37-04	5.28-04	4.39-04	3.65-04	3.00-04
16	1.91-02	8.06-03	4.81-03	3.29-03	2.41-03	1.84-03	1.45-03	1.17-03	9.49-04	7.80-04	6.46-04	5.34-04	4.37-04	3.58-04
15	2.27-02	9.64-03	5.79-03	3.99-03	2.94-03	2.27-03	1.79-03	1.44-03	1.18-03	9.70-04	7.99-04	6.51-04	5.01-04	
14	2.75-02	1.17-02	7.10-03	4.93-03	3.66-03	2.84-03	2.26-03	1.83-03	1.49-03	1.22-03	9.98-04	7.62-04		
13	3.39-02	1.45-02	8.88-03	6.21-03	4.66-03	3.63-03	2.91-03	2.36-03	1.93-03	1.56-03	1.19-03			
12	4.25-02	1.84-02	1.14-02	8.03-03	6.07-03	4.78-03	3.85-03	3.13-03	2.53-03	1.93-03				
11	5.46-02	2.39-02	1.49-02	1.07-02	8.18-03	6.50-03	5.26-03	4.29-03	3.26-03					
10	7.21-02	3.20-02	2.03-02	1.48-02	1.15-02	9.22-03	7.46-03	5.75-03						
9	9.85-02	4.44-02	2.88-02	2.14-02	1.69-02	1.37-02	1.07-02							
8	1.41-01	6.49-02	4.33-02	3.32-02	2.68-02	2.12-02								
7	2.13-01	1.02-01	7.08-02	5.65-02	4.56-02									
6	3.51-01	1.76-01	1.31-01	1.09-01										
5	6.56-01	3.61-01	2.96-01											
4	1.53+00	1.00+00												
3	5.66+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.02-05	8.52-06	7.20-06	6.14-06	5.28-06	4.57-06	3.98-06	3.49-06	3.08-06	2.73-06	2.43-06	2.17-06	1.95-06	1.76-06
45	1.26-05	1.06-05	8.94-06	7.64-06	6.57-06	5.70-06	4.97-06	4.37-06	3.86-06	3.42-06	3.05-06	2.73-06	2.45-06	2.21-06
40	1.68-05	1.41-05	1.20-05	1.03-05	8.88-06	7.72-06	6.75-06	5.94-06	5.25-06	4.67-06	4.17-06	3.73-06	3.36-06	3.03-06
35	2.34-05	2.07-05	1.77-05	1.52-05	1.32-05	1.15-05	1.01-05	8.91-06	7.90-06	7.04-06	6.29-06	5.64-06	5.07-06	4.57-06
30	3.98-05	3.39-05	2.92-05	2.52-05	2.20-05	1.93-05	1.70-05	1.50-05	1.33-05	1.18-05	1.05-05	9.27-06	8.09-06	6.66-06
29	4.86-05	3.80-05	3.27-05	2.84-05	2.47-05	2.16-05	1.90-05	1.68-05	1.49-05	1.32-05	1.16-05	1.01-05	8.29-06	
28	5.01-05	4.29-05	3.69-05	3.20-05	2.79-05	2.44-05	2.15-05	1.89-05	1.67-05	1.47-05	1.27-05	1.04-05		
27	5.67-05	4.85-05	4.18-05	3.63-05	3.16-05	2.77-05	2.43-05	2.13-05	1.86-05	1.61-05	1.31-05			
26	6.45-05	5.52-05	4.76-05	4.13-05	3.59-05	3.14-05	2.74-05	2.39-05	2.05-05	1.67-05				
25	7.37-05	6.31-05	5.44-05	4.71-05	4.09-05	3.56-05	3.09-05	2.64-05	2.14-05					
24	8.46-05	7.25-05	6.24-05	5.39-05	4.67-05	4.03-05	3.43-05	2.76-05						
23	9.76-05	8.35-05	7.18-05	6.19-05	5.31-05	4.50-05	3.61-05							
22	1.13-04	9.67-05	8.29-05	7.08-05	5.97-05	4.76-05								
21	1.32-04	1.12-04	9.55-05	8.01-05	6.35-05									
20	1.54-04	1.30-04	1.09-04	8.58-05										
19	1.81-04	1.50-04	1.18-04											
18	2.11-04	1.64-04												
17	2.33-04													

HE + TE = 3.00+03 NE = 1.00+05 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.97-37	-1.06-36	-3.22-36	-7.68-36	-1.57-35	-2.86-35	-4.78-35	-7.48-35	-1.11-34	-1.57-34	-2.14-34	-2.83-34	-3.62-34
45	0.00+00	-1.97-37	-1.15-36	-3.50-36	-8.27-36	-1.66-35	-2.97-35	-4.86-35	-7.37-35	-1.05-34	-1.41-34	-1.79-34	-2.14-34	-2.38-34
40	0.00+00	-1.80-37	-1.22-36	-3.77-36	-8.86-36	-1.76-35	-3.09-35	-4.90-35	-7.13-35	-9.52-35	-1.16-34	-1.25-34	-1.07-34	-4.22-35
35	0.00+00	-9.19-38	-1.11-36	-3.56-36	-8.43-36	-1.66-35	-2.83-35	-4.28-35	-5.72-35	-6.91-35	-5.50-35	-6.92-36	1.12-34	3.52-34
30	0.00+00	1.69-37	-4.92-37	-2.02-36	-5.02-36	-9.72-36	-1.53-35	-1.90-35	-1.43-35	1.19-35	8.33-35	2.42-34	5.59-34	1.16-33
29	0.00+00	2.52-37	-2.76-37	-1.46-36	-3.77-36	-7.20-36	-1.06-35	-1.07-35	1.15-37	3.66-35	1.26-34	3.17-34	6.94-34	1.40-33
28	0.00+00	3.48-37	-2.13-38	-7.91-37	-2.25-36	-4.14-36	-4.98-36	-7.39-37	1.72-35	6.57-35	1.76-34	4.04-34	8.51-34	1.69-33
27	0.00+00	4.57-37	2.71-37	-3.66-39	-4.36-37	-4.68-37	1.87-36	1.13-35	3.78-35	1.01-34	2.35-34	5.08-34	1.04-33	2.04-33
26	0.00+00	5.78-37	6.02-37	9.07-37	1.70-36	3.93-36	1.02-35	2.61-35	6.31-35	1.43-34	3.08-34	6.35-34	1.26-33	2.46-33
25	0.00+00	7.13-37	9.75-37	1.96-36	4.21-36	9.22-36	2.03-35	4.42-35	9.45-35	1.97-34	3.99-34	7.93-34	1.55-33	3.00-33
24	0.00+00	8.64-37	1.39-36	3.18-36	7.21-36	1.57-35	3.28-35	6.70-35	1.34-34	2.65-34	5.16-34	9.97-34	1.92-33	3.71-33
23	0.00+00	1.03-36	1.87-36	4.60-36	1.08-35	2.35-35	4.85-35	9.60-35	1.86-34	3.54-34	6.69-34	1.27-33	2.42-33	4.67-33
22	0.00+00	1.23-36	2.40-36	6.26-36	1.51-35	3.33-35	6.83-35	1.34-34	2.54-34	4.73-34	8.79-34	1.64-33	3.11-33	6.05-33
21	0.00+00	1.45-36	3.03-36	8.23-36	2.04-35	4.56-35	9.40-35	1.84-34	3.46-34	6.39-34	1.18-33	2.18-33	4.13-33	8.10-33
20	0.00+00	1.72-36	3.76-36	1.06-35	2.71-35	6.14-35	1.28-34	2.51-34	4.75-34	8.78-34	1.61-33	2.99-33	5.70-33	1.14-32
19	0.00+00	2.09-36	4.65-36	1.36-35	3.55-35	8.21-35	1.74-34	3.46-34	6.62-34	1.24-33	2.29-33	4.30-33	8.30-33	1.69-32
18	0.00+00	2.45-36	5.76-36	1.73-35	4.64-35	1.10-34	2.38-34	4.84-34	9.43-34	1.80-33	3.41-33	6.53-33	1.29-32	2.64-32
17	0.00+00	2.96-36	7.18-36	2.22-35	6.12-35	1.49-34	3.31-34	6.92-34	1.39-33	2.74-33	5.39-33	1.07-32	2.14-32	3.65-32
16	0.00+00	3.62-36	9.04-36	2.88-35	8.17-35	2.05-34	4.73-34	1.03-33	2.15-33	4.46-33	9.26-33	1.92-32	3.38-32	-2.13-31
15	0.00+00	4.49-36	1.16-35	3.80-35	1.12-34	2.91-34	7.00-34	1.60-33	3.57-33	7.95-33	1.79-32	3.66-32	-1.45-31	
14	0.00+00	5.67-36	1.51-35	5.14-35	1.57-34	4.29-34	1.09-33	2.68-33	6.52-33	1.62-32	3.99-32	-4.93-32		
13	0.00+00	7.31-36	2.02-35	7.18-35	2.30-34	6.70-34	1.80-33	4.99-33	1.35-32	4.08-32	4.58-32			
12	0.00+00	9.66-36	2.79-35	1.05-34	3.58-34	1.13-33	3.48-33	1.10-32	3.83-32	1.23-31				
11	0.00+00	1.32-35	4.01-35	1.61-34	6.05-34	2.10-33	7.87-33	3.25-32	1.70-31					
10	0.00+00	1.86-35	6.10-35	2.70-34	1.15-33	4.9 -33	2.46-32	1.82-31						
9	0.00+00	2.77-35	1.00-34	5.11-34	2.68-33	1.62-32	1.62-31							
8	0.00+00	4.42-35	1.85-34	1.17-33	8.91-33	1.19-31								
7	0.00+00	7.80-35	4.09-34	3.89-33	7.00-32									
6	0.00+00	1.62-34	1.29-33	3.11-32										
5	0.00+00	4.53-34	9.65-33											
4	0.00+00	2.68-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-4.51-34	-5.49-34	-6.57-34	-7.74-34	-9.05-34	-1.06-33	-1.25-33	-1.52-33	-1.91-33	-2.51-33	-3.44-33	-4.91-33	-7.21-33	-1.08-32
45	-2.80-34	-2.06-34	-1.14-34	5.95-35	3.47-34	7.64-34	1.41-33	2.28-33	3.42-33	4.88-33	6.68-33	8.78-33	1.11-32	1.34-32
40	1.02-34	3.72-34	8.32-34	1.57-33	2.71-33	4.43-33	6.96-33	1.06-32	1.59-32	2.34-32	3.40-32	4.90-32	7.03-32	1.01-31
35	7.55-34	1.56-33	2.84-33	4.92-33	8.23-33	1.35-32	2.17-32	3.47-32	5.53-32	8.85-32	1.43-31	2.36-31	4.00-31	7.10-31
30	2.25-33	4.17-33	7.54-33	1.34-32	2.36-32	4.18-32	7.49-32	1.37-31	2.62-31	5.33-31	1.20-30	3.18-30	1.16-29	9.16-29
29	2.70-33	5.03-33	9.17-33	1.65-32	2.99-32	5.40-32	1.01-31	1.96-31	4.04-31	9.19-31	2.47-30	9.05-30	7.20-29	
28	3.24-33	6.07-33	1.12-32	2.06-32	3.83-32	7.25-32	1.42-31	2.97-31	6.82-31	1.86-30	6.82-30	5.44-29		
27	3.90-33	7.36-33	1.38-32	2.61-32	5.03-32	1.00-31	2.11-31	4.91-31	1.34-30	4.96-30	3.97-29			
26	4.73-33	9.04-33	1.74-32	3.39-32	6.85-32	1.46-31	3.42-31	9.38-31	3.49-30	2.78-29				
25	5.81-33	1.13-32	2.23-32	4.55-32	9.82-32	2.31-31	6.37-31	2.37-30	1.88-29					
24	7.28-33	1.44-32	2.96-32	6.41-32	1.52-31	4.18-31	1.55-30	1.22-29						
23	9.28-33	1.89-32	4.10-32	9.65-32	2.65-31	9.70-31	7.46-30							
22	1.22-32	2.60-32	6.05-32	1.63-31	5.81-31	4.28-30								
21	1.68-32	3.78-32	9.79-32	3.30-31	2.23-30									
20	2.44-32	5.90-32	1.79-31	9.72-3										
19	3.74-32	9.44-32	2.67-31											
18	5.96-32	-8.62-32												
17	-2.14-31													

HE + TE = 3.00+03 NE = 1.00+06 CASE B NC = 70

TOTAL RC = 3.944-12 4-3 RC = 1.085-12 4-3 EM = 4.599-24 2S RC = 9.487-13 2P RC = 2.995-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.74-03	2.38-03	1.02-03	5.30-04	3.09-04	1.96-04	1.32-04	9.31-05	6.81-05	5.13-05	3.96-05	3.12-05	2.51-05	2.04-05
45	8.83-03	2.71-03	1.17-03	6.06-04	3.54-04	2.25-04	1.51-04	1.07-04	7.82-05	5.89-05	4.55-05	3.59-05	2.88-05	2.35-05
40	9.94-03	3.06-03	1.32-03	6.86-04	4.02-04	2.55-04	1.72-04	1.22-04	8.91-05	6.72-05	5.20-05	4.10-05	3.29-05	2.69-05
35	1.17-02	3.62-03	1.57-03	8.19-04	4.81-04	3.07-04	2.08-04	1.47-04	1.08-04	8.18-05	6.34-05	5.01-05	4.03-05	3.29-05
30	1.46-02	4.58-03	2.01-03	1.06-03	6.31-04	4.06-04	2.78-04	1.98-04	1.47-04	1.12-04	8.69-05	6.91-05	5.59-05	4.58-05
29	1.53-02	4.82-03	2.13-03	1.13-03	6.73-04	4.35-04	2.98-04	2.13-04	1.58-04	1.21-04	9.41-05	7.49-05	6.07-05	4.98-05
28	1.60-02	5.07-03	2.25-03	1.20-03	7.20-04	4.67-04	3.21-04	2.30-04	1.71-04	1.31-04	1.03-04	8.18-05	6.63-05	5.45-05
27	1.67-02	5.33-03	2.39-03	1.28-03	7.72-04	5.03-04	3.47-04	2.50-04	1.87-04	1.43-04	1.12-04	8.99-05	7.31-05	6.02-05
26	1.73-02	5.60-03	2.53-03	1.37-03	8.31-04	5.45-04	3.78-04	2.74-04	2.05-04	1.58-04	1.24-04	9.96-05	8.11-05	6.70-05
25	1.80-02	5.87-03	2.68-03	1.47-03	8.98-04	5.93-04	4.14-04	3.02-04	2.27-04	1.75-04	1.38-04	1.11-04	9.09-05	7.52-05
24	1.85-02	6.15-03	2.85-03	1.58-03	9.75-04	6.50-04	4.57-04	3.35-04	2.53-04	1.96-04	1.56-04	1.25-04	1.03-04	8.52-05
23	1.89-02	6.43-03	3.03-03	1.70-03	1.07-03	7.17-04	5.08-04	3.74-04	2.85-04	2.22-04	1.77-04	1.43-04	1.17-04	9.75-05
22	1.93-02	6.72-03	3.24-03	1.85-03	1.17-03	7.97-04	5.70-04	4.23-04	3.24-04	2.54-04	2.03-04	1.65-04	1.35-04	1.13-04
21	1.96-02	7.04-03	3.48-03	2.02-03	1.30-03	8.95-04	6.46-04	4.83-04	3.72-04	2.93-04	2.35-04	1.91-04	1.58-04	1.32-04
20	2.00-02	7.41-03	3.76-03	2.23-03	1.46-03	1.02-03	7.40-04	5.58-04	4.32-04	3.42-04	2.76-04	2.25-04	1.86-04	1.55-04
19	2.05-02	7.85-03	4.10-03	2.49-03	1.65-03	1.17-03	8.58-04	6.52-04	5.08-04	4.04-04	3.27-04	2.67-04	2.21-04	1.84-04
18	2.13-02	8.41-03	4.53-03	2.81-03	1.90-03	1.36-03	1.01-03	7.72-04	6.05-04	4.83-04	3.91-04	3.21-04	2.65-04	2.19-04
17	2.27-02	9.17-03	5.07-03	3.22-03	2.21-03	1.60-03	1.20-03	9.25-04	7.29-04	5.84-04	4.74-04	3.88-04	3.19-04	2.60-04
16	2.48-02	1.02-02	5.78-03	3.75-03	2.61-03	1.91-03	1.45-03	1.12-03	8.90-04	7.15-04	5.80-04	4.73-04	3.82-04	2.93-04
15	2.79-02	1.16-02	6.73-03	4.44-03	3.14-03	2.33-03	1.78-03	1.39-03	1.10-03	8.87-04	7.17-04	5.75-04	4.38-04	
14	3.25-02	1.36-02	8.02-03	5.38-03	3.86-03	2.89-03	2.22-03	1.75-03	1.39-03	1.11-03	8.86-04	7.10-04		
13	3.88-02	1.65-02	9.82-03	6.66-03	4.85-03	3.66-03	2.84-03	2.24-03	1.78-03	1.41-03	1.06-03			
12	4.78-02	2.05-02	1.24-02	8.52-03	6.26-03	4.77-03	3.72-03	2.93-03	2.31-03	1.72-03				
11	6.06-02	2.67-02	1.61-02	1.12-02	8.34-03	6.42-03	5.02-03	3.92-03	2.92-03					
10	7.94-02	3.49-02	2.17-02	1.54-02	1.16-02	8.96-03	6.98-03	5.18-03						
9	1.08-01	4.82-02	3.06-02	2.21-02	1.68-02	1.31-02	9.74-03							
8	1.54-01	7.01-02	4.57-02	3.37-02	2.61-02	1.96-02								
7	2.33-01	1.09-01	7.38-02	5.61-02	4.26-02									
6	3.82-01	1.88-01	1.34-01	1.03-01										
5	7.12-01	3.79-01	2.88-01											
4	1.65+00	1.00+00												
3	5.87+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.68-05	1.41-05	1.19-05	1.01-05	8.65-06	7.48-06	6.51-06	5.70-06	5.02-06	4.44-06	3.95-06	3.53-06	3.16-06	2.85-06
45	1.94-05	1.62-05	1.36-05	1.16-05	9.96-06	8.61-06	7.49-06	6.56-06	5.78-06	5.11-06	4.55-06	4.06-06	3.64-06	3.27-06
40	2.22-05	1.85-05	1.56-05	1.33-05	1.14-05	9.89-06	8.61-06	7.54-06	6.64-06	5.87-06	5.22-06	4.66-06	4.18-06	3.76-06
35	2.72-05	2.28-05	1.92-05	1.64-05	1.41-05	1.22-05	1.06-05	9.31-06	8.20-06	7.26-06	6.45-06	5.75-06	5.14-06	4.61-06
30	3.80-05	3.19-05	2.70-05	2.31-05	1.99-05	1.73-05	1.50-05	1.32-05	1.16-05	1.02-05	9.03-06	7.95-06	6.91-06	5.68-06
29	4.14-05	3.48-05	2.95-05	2.52-05	2.17-05	1.89-05	1.64-05	1.44-05	1.27-05	1.11-05	9.77-06	8.46-06	6.93-06	
28	4.54-05	3.82-05	3.24-05	2.78-05	2.39-05	2.08-05	1.81-05	1.58-05	1.39-05	1.21-05	1.05-05	8.56-06		
27	5.02-05	4.23-05	3.59-05	3.08-05	2.65-05	2.30-05	2.00-05	1.75-05	1.52-05	1.33-05	1.07-05			
26	5.59-05	4.72-05	4.01-05	3.44-05	2.97-05	2.57-05	2.23-05	1.94-05	1.66-05	1.35-05				
25	6.29-05	5.31-05	4.53-05	3.88-05	3.35-05	2.89-05	2.50-05	2.13-05	1.73-05					
24	7.14-05	6.04-05	5.15-05	4.41-05	3.80-05	3.26-05	2.78-05	2.24-05						
23	8.19-05	6.93-05	5.91-05	5.05-05	4.32-05	3.66-05	2.94-05							
22	9.48-05	8.03-05	6.83-05	5.81-05	4.89-05	3.91-05								
21	1.11-04	9.36-05	7.91-05	6.63-05	5.26-05									
20	1.30-04	1.09-04	9.11-05	7.19-05										
19	1.54-04	1.27-04	9.97-05											
18	1.80-04	1.40-04												
17	2.01-04													

HE + TE = 3.00+03 NE = 1.00+06 CASE B NC = 70

TABLE 6 LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-4.49-37	-2.18-36	-6.74-36	-1.67-35	-3.56-35	-6.87-35	-1.23-34	-2.07-34	-3.33-34	-5.17-34	-7.79-34	-1.15-33	-1.67-33
45	0.00+00	-4.73-37	-2.38-36	-7.35-36	-1.81-35	-3.85-35	-7.38-35	-1.31-34	-2.20-34	-3.52-34	-5.45-34	-8.21-34	-1.21-33	-1.76-33
40	0.00+00	-4.62-37	-2.47-36	-7.66-36	-1.87-35	-3.93-35	-7.43-35	-1.30-34	-2.15-34	-3.39-34	-5.17-34	-7.68-34	-1.12-33	-1.62-33
35	0.00+00	-4.36-37	-2.61-36	-8.11-36	-1.96-35	-4.04-35	-7.47-35	-1.27-34	-2.04-34	-3.10-34	-4.54-34	-6.45-34	-9.00-34	-1.24-33
30	0.00+00	-3.69-37	-2.80-36	-8.83-36	-2.11-35	-4.28-35	-7.69-35	-1.26-34	-1.89-34	-2.65-34	-3.43-34	-4.08-34	-4.31-34	-3.72-34
29	0.00+00	-3.37-37	-2.81-36	-8.90-36	-2.13-35	-4.30-35	-7.66-35	-1.24-34	-1.82-34	-2.47-34	-3.02-34	-3.19-34	-2.52-34	-2.57-35
28	0.00+00	-2.90-37	-2.78-36	-8.89-36	-2.13-35	-4.27-35	-7.55-35	-1.20-34	-1.73-34	-2.23-34	-2.47-34	-2.43-34	-1.70-35	4.33-34
27	0.00+00	-2.27-37	-2.71-36	-8.77-36	-2.10-35	-4.20-35	-7.34-35	-1.14-34	-1.59-34	-1.91-34	-1.76-34	-1.08-34	2.93-34	1.05-33
26	0.00+00	-1.42-37	-2.57-36	-8.49-36	-2.04-35	-4.05-35	-7.00-35	-1.06-34	-1.40-34	-1.48-34	-8.21-35	1.47-34	7.04-34	1.89-33
25	0.00+00	-2.82-38	-2.36-36	-8.01-36	-1.93-35	-3.81-35	-6.46-35	-9.44-35	-1.14-34	-9.07-35	4.10-35	4.10-34	1.26-33	3.04-33
24	0.00+00	1.22-37	-2.05-36	-7.26-36	-1.76-35	-3.45-35	-5.69-35	-7.82-35	-7.92-35	-1.63-35	2.02-34	7.56-34	2.00-33	4.65-33
23	0.00+00	3.16-37	-1.61-36	-6.18-36	-1.51-35	-2.93-35	-4.62-35	-5.62-35	-3.34-35	8.10-35	4.12-34	1.22-33	3.03-33	6.95-33
22	0.00+00	5.61-37	-1.03-36	-4.68-36	-1.17-35	-2.21-35	-3.17-35	-2.70-35	2.65-35	2.08-34	6.89-34	1.84-33	4.46-33	1.04-32
21	0.00+00	8.65-37	-2.68-37	-2.71-36	-7.18-36	-1.29-35	-1.23-35	1.19-35	1.06-34	3.76-34	1.06-33	2.71-33	6.56-33	1.57-32
20	0.00+00	1.24-36	6.81-37	-1.81-37	-1.20-36	3.59-37	1.38-35	6.42-35	2.13-34	6.05-34	1.58-33	3.96-33	9.79-33	2.47-32
19	0.00+00	1.68-36	1.86-36	3.06-36	6.64-36	1.75-35	4.91-35	1.36-34	3.60-34	9.26-34	2.33-33	5.87-33	1.51-32	4.15-32
18	0.00+00	2.21-36	3.29-36	7.18-36	1.69-35	4.66-35	9.80-35	2.37-34	5.73-34	1.40-33	3.49-33	9.01-33	2.49-32	7.88-32
17	0.00+00	2.85-36	5.04-36	1.24-35	3.06-35	7.27-35	1.68-34	3.87-34	9.01-34	2.16-33	5.44-33	1.48-32	4.61-32	1.87-31
16	0.00+00	3.62-36	7.20-36	1.92-35	4.94-35	1.19-34	2.74-34	6.23-34	1.44-33	3.47-33	9.08-33	2.72-32	1.01-31	7.66-31
15	0.00+00	4.60-36	9.94-36	2.84-35	7.61-35	1.88-34	4.42-34	1.02-33	2.41-33	6.03-33	1.70-32	6.00-32	3.62-31	
14	0.00+00	5.86-36	1.36-35	4.12-35	1.16-34	2.98-34	7.29-34	1.76-33	4.58-33	1.19-32	3.83-32	1.70-31		
13	0.00+00	7.58-36	1.86-35	6.00-35	1.78-34	4.87-34	1.27-33	3.31-33	9.13-33	2.87-32	9.97-32			
12	0.00+00	1.00-35	2.61-35	8.95-35	2.85-34	8.03-34	2.43-33	7.23-33	2.41-32	8.84-32				
11	0.00+00	1.36-35	3.78-35	1.40-34	4.88-34	1.62-33	5.46-33	2.07-32	9.82-32					
10	0.00+00	1.93-35	5.76-35	2.35-34	9.32-34	3.70-33	1.66-32	1.06-31						
9	0.00+00	2.87-35	9.46-35	4.44-34	2.14-33	1.17-32	1.01-31							
8	0.00+00	4.56-35	1.74-34	1.01-33	6.98-33	8.11-32								
7	0.00+00	8.03-35	3.82-34	3.29-33	5.23-32									
6	0.00+00	1.66-34	1.19-33	2.54-32										
5	0.00+00	4.61-34	8.62-33											
4	0.00+00	2.68-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-2.38-33	-3.37-33	-4.72-33	-6.57-33	-9.10-33	-1.25-32	-1.72-32	-2.35-32	-3.19-32	-4.33-32	-5.86-32	-7.91-32	-1.07-31	-1.44-31
45	-2.53-33	-3.61-33	-5.12-33	-7.25-33	-1.02-32	-1.44-32	-2.03-32	-2.85-32	-4.00-32	-5.61-32	-7.87-32	-1.11-31	-1.56-31	-2.20-31
40	-2.33-33	-3.34-33	-4.80-33	-6.93-33	-1.01-32	-1.47-32	-2.16-32	-3.18-32	-4.70-32	-7.00-32	-1.05-31	-1.58-31	-2.41-31	-3.72-31
35	-1.73-33	-2.42-33	-3.47-33	-5.13-33	-7.79-33	-1.22-32	-1.99-32	-3.17-32	-5.25-32	-8.86-32	-1.52-31	-2.69-31	-4.93-31	-9.51-31
30	-1.48-34	2.29-34	9.16-34	1.92-33	3.22-33	4.93-33	6.87-33	1.50-33	-1.32-32	-6.24-32	-2.25-31	-8.04-31	-4.07-30	-4.15-29
29	4.76-34	1.40-33	3.00-33	5.[illegible]-33	9.57-33	1.56-32	2.40-32	3.50-32	4.56-32	3.85-32	-8.11-32	-1.03-30	-1.49-29	
28	1.34-33	3.03-33	6.01-33	1.[illegible]-32	1.97-32	3.45-32	6.[illegible]-32	1.07-31	1.98-31	3.99-31	9.41-31	2.85-30		
27	2.95-33	5.35-33	1.05-32	1.97-32	3.66-32	6.88-32	1.34-31	2.78-31	6.66-31	2.11-30	1.38-29			
26	4.23-33	8.71-33	1.73-32	3.37-32	6.64-32	1.36-31	3.01-31	7.71-31	2.66-30	1.95-29				
25	6.63-33	1.38-32	2.81-32	5.77-32	1.23-31	2.85-31	7.63-31	2.76-30	2.14-29					
24	1.01-32	2.16-32	4.61-32	1.02-31	2.40-31	6.79-31	2.50-30	2.03-29						
23	1.55-32	3.43-32	7.87-32	1.94-31	5.56-31	2.14-30	1.77-29							
22	2.39-32	5.67-32	1.45-31	4.25-31	1.67-30	1.41-29								
21	3.85-32	1.01-31	3.04-31	1.22-30	1.04-29									
20	6.64-32	2.04-31	8.38-31	7.18-30										
19	1.30-31	5.37-31	4.61-30											
18	3.28-31	2.73-30												
17	1.51-30													

HE + TE = 3.00+03 NE = 1.00+07 CASE B NC = 53

TOTAL RC = 4.224-12 4-3 RC = 1.069-12 4-3 EM = 4.531-24 2S RC = 1.056-12 2P RC = 3.168-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.06-02	3.25-03	1.39-03	7.23-04	4.22-04	2.67-04	1.80-04	1.27-04	9.26-05	6.98-05	5.38-05	4.24-05	3.40-05	2.77-05
45	1.38-02	4.23-03	1.82-03	9.42-04	5.49-04	3.48-04	2.34-04	1.65-04	1.21-04	9.09-05	7.02-05	5.53-05	4.43-05	3.61-05
40	1.76-02	5.41-03	2.33-03	1.21-03	7.04-04	4.46-04	3.00-04	2.12-04	1.55-04	1.16-04	8.99-05	7.08-05	5.68-05	4.62-05
35	2.14-02	6.56-03	2.82-03	1.46-03	8.55-04	5.42-04	3.65-04	2.57-04	1.88-04	1.42-04	1.09-04	8.62-05	6.92-05	5.63-05
30	2.48-02	7.51-03	3.24-03	1.68-03	9.83-04	6.24-04	4.21-04	2.97-04	2.18-04	1.64-04	1.27-04	9.99-05	8.01-05	6.53-05
29	2.51-02	7.74-03	3.34-03	1.73-03	1.01-03	6.44-04	4.35-04	3.07-04	2.25-04	1.70-04	1.31-04	1.03-04	8.29-05	6.75-05
28	2.60-02	8.00-03	3.45-03	1.80-03	1.05-03	6.69-04	4.51-04	3.19-04	2.34-04	1.76-04	1.36-04	1.08-04	8.63-05	7.03-05
27	2.70-02	8.33-03	3.60-03	1.87-03	1.10-03	6.99-04	4.72-04	3.34-04	2.45-04	1.85-04	1.43-04	1.13-04	9.05-05	7.38-05
26	2.82-02	8.72-03	3.77-03	1.97-03	1.15-03	7.35-04	4.97-04	3.52-04	2.58-04	1.95-04	1.51-04	1.19-04	9.58-05	7.80-05
25	2.97-02	9.18-03	3.98-03	2.08-03	1.22-03	7.80-04	5.28-04	3.74-04	2.75-04	2.08-04	1.61-04	1.27-04	1.02-04	8.34-05
24	3.13-02	9.73-03	4.23-03	2.22-03	1.31-03	8.34-04	5.66-04	4.01-04	2.95-04	2.24-04	1.73-04	1.37-04	1.10-04	9.09-05
23	3.33-02	1.04-02	4.52-03	2.38-03	1.40-03	8.99-04	6.11-04	4.35-04	3.20-04	2.43-04	1.89-04	1.49-04	1.20-04	9.92-05
22	3.56-02	1.11-02	4.86-03	2.56-03	1.52-03	9.77-04	6.66-04	4.75-04	3.51-04	2.67-04	2.07-04	1.64-04	1.33-04	1.08-04
21	3.77-02	1.19-02	5.24-03	2.78-03	1.66-03	1.07-03	7.33-04	5.24-04	3.88-04	2.96-04	2.31-04	1.83-04	1.48-04	1.21-04
20	4.01-02	1.28-02	5.68-03	3.04-03	1.82-03	1.18-03	8.14-04	5.85-04	4.35-04	3.33-04	2.60-04	2.07-04	1.67-04	1.37-04
19	4.26-02	1.37-02	6.17-03	3.33-03	2.02-03	1.32-03	9.15-04	6.61-04	4.94-04	3.79-04	2.97-04	2.37-04	1.92-04	1.57-04
18	4.50-02	1.47-02	6.74-03	3.69-03	2.26-03	1.49-03	1.04-03	7.58-04	5.70-04	4.39-04	3.46-04	2.77-04	2.24-04	1.83-04
17	4.73-02	1.58-02	7.40-03	4.12-03	2.56-03	1.71-03	1.21-03	8.85-04	6.69-04	5.19-04	4.10-04	3.28-04	2.65-04	2.14-04
16	4.95-02	1.71-02	8.19-03	4.66-03	2.95-03	2.00-03	1.42-03	1.05-03	8.02-04	6.25-04	4.95-04	3.96-04	3.16-04	2.41-04
15	5.16-02	1.85-02	9.19-03	5.36-03	3.46-03	2.38-03	1.72-03	1.28-03	9.82-04	7.68-04	6.08-04	4.80-04	3.63-04	
14	5.44-02	2.04-02	1.05-02	6.30-03	4.15-03	2.90-03	2.12-03	1.59-03	1.23-03	9.61-04	7.51-04	5.62-04		
13	5.86-02	2.29-02	1.23-02	7.59-03	5.11-03	3.63-03	2.68-03	2.03-03	1.57-03	1.21-03	8.97-04			
12	6.56-02	2.66-02	1.48-02	9.42-03	6.48-03	4.67-03	3.48-03	2.65-03	2.02-03	1.48-03				
11	7.72-02	3.21-02	1.85-02	1.21-02	8.49-03	6.20-03	4.65-03	3.51-03	2.54-03					
10	9.60-02	4.08-02	2.42-02	1.62-02	1.16-02	8.55-03	6.37-03	4.56-03						
9	1.26-01	5.48-02	3.33-02	2.28-02	1.65-02	1.22-02	8.67-03							
8	1.77-01	7.83-02	4.88-02	3.42-02	2.49-02	1.76-02								
7	2.64-01	1.20-01	7.76-02	5.52-02	3.91-02									
6	4.31-01	2.04-01	1.37-01	9.67-02										
5	7.99-01	4.02-01	2.78-01											
4	1.82+00	1.00+00												
3	6.20+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.28-05	1.90-05	1.61-05	1.37-05	1.17-05	1.01-05	8.81-06	7.71-06	6.78-06	6.00-06	5.33-06	4.76-06	4.27-06	3.84-06
45	2.97-05	2.48-05	2.09-05	1.78-05	1.53-05	1.32-05	1.15-05	1.00-05	8.83-06	7.81-06	6.94-06	6.19-06	5.55-06	4.99-06
40	3.81-05	3.18-05	2.68-05	2.28-05	1.95-05	1.69-05	1.47-05	1.28-05	1.13-05	9.98-06	8.87-06	7.91-06	7.08-06	6.36-06
35	4.64-05	3.87-05	3.26-05	2.77-05	2.38-05	2.05-05	1.79-05	1.56-05	1.37-05	1.21-05	1.07-05	9.56-06	8.53-06	7.64-06
30	5.38-05	4.49-05	3.78-05	3.22-05	2.76-05	2.38-05	2.06-05	1.80-05	1.58-05	1.39-05	1.22-05	1.07-05	9.55-06	7.58-06
29	5.57-05	4.65-05	3.92-05	3.33-05	2.85-05	2.46-05	2.13-05	1.86-05	1.63-05	1.42-05	1.24-05	1.07-05	8.75-06	
28	5.80-05	4.84-05	4.08-05	3.47-05	2.97-05	2.56-05	2.22-05	1.93-05	1.68-05	1.46-05	1.25-05	1.02-05		
27	6.09-05	5.08-05	4.28-05	3.64-05	3.11-05	2.68-05	2.32-05	2.01-05	1.74-05	1.49-05	1.20-05			
26	6.44-05	5.38-05	4.53-05	3.85-05	3.29-05	2.83-05	2.44-05	2.10-05	1.79-05	1.44-05				
25	6.89-05	5.75-05	4.84-05	4.11-05	3.51-05	3.01-05	2.57-05	2.18-05	1.75-05					
24	7.43-05	6.20-05	5.22-05	4.43-05	3.77-05	3.21-05	2.71-05	2.16-05						
23	8.11-05	6.77-05	5.69-05	4.81-05	4.07-05	3.42-05	2.72-05							
22	8.95-05	7.47-05	6.27-05	5.27-05	4.39-05	3.47-05								
21	1.00-04	8.37-05	6.95-05	5.76-05	4.53-05									
20	1.13-04	9.37-05	7.71-05	6.04-05										
19	1.29-04	1.05-04	8.22-05											
18	1.48-04	1.15-04												
17	1.64-04													

HE + TE = 3.00+03 NE = 1.00+07 CASE B NC = 53

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-6.52-37	-3.10-36	-9.66-36	-2.42-35	-5.25-35	-1.03-34	-1.87-34	-3.21-34	-5.27-34	-8.34-34	-1.28-33	-1.93-33	-2.85-33
45	0.00+00	-8.39-37	-4.02-36	-1.26-35	-3.16-35	-6.88-35	-1.35-34	-2.47-34	-4.27-34	-7.06-34	-1.13-33	-1.75-33	-2.67-33	-3.98-33
40	0.00+00	-1.04-36	-5.08-36	-1.59-35	-4.02-35	-8.78-35	-1.74-34	-3.19-34	-5.55-34	-9.25-34	-1.49-33	-2.35-33	-3.64-33	-5.52-33
35	0.00+00	-1.16-36	-5.92-36	-1.87-35	-4.72-35	-1.03-34	-2.05-34	-3.78-34	-6.62-34	-1.12-33	-1.83-33	-2.93-33	-4.63-33	-7.24-33
30	0.00+00	-1.09-36	-6.13-36	-1.95-35	-4.91-35	-1.07-34	-2.11-34	-3.89-34	-6.81-34	-1.16-33	-1.92-33	-3.15-33	-5.14-33	-8.38-33
29	0.00+00	-1.05-36	-6.13-36	-1.96-35	-4.91-35	-1.07-34	-2.10-34	-3.86-34	-6.75-34	-1.14-33	-1.90-33	-3.14-33	-5.17-33	-8.52-33
28	0.00+00	-1.01-36	-6.13-36	-1.96-35	-4.92-35	-1.07-34	-2.09-34	-3.83-34	-6.68-34	-1.13-33	-1.88-33	-3.12-33	-5.18-33	-8.66-33
27	0.00+00	-9.67-37	-6.16-36	-1.98-35	-4.95-35	-1.07-34	-2.09-34	-3.81-34	-6.62-34	-1.12-33	-1.86-33	-3.10-33	-5.19-33	-8.80-33
26	0.00+00	-9.20-37	-6.20-36	-2.00-35	-5.00-35	-1.08-34	-2.09-34	-3.79-34	-6.56-34	-1.10-33	-1.84-33	-3.07-33	-5.19-33	-8.95-33
25	0.00+00	-8.67-37	-6.27-36	-2.03-35	-5.07-35	-1.09-34	-2.10-34	-3.78-34	-6.50-34	-1.09-33	-1.81-33	-3.02-33	-5.17-33	-9.09-33
24	0.00+00	-8.02-37	-6.33-36	-2.06-35	-5.15-35	-1.10-34	-2.11-34	-3.78-34	-6.43-34	-1.07-33	-1.76-33	-2.95-33	-5.08-33	-9.15-33
23	0.00+00	-7.18-37	-6.39-36	-2.10-35	-5.24-35	-1.11-34	-2.13-34	-3.76-34	-6.32-34	-1.03-33	-1.68-33	-2.80-33	-4.86-33	-8.99-33
22	0.00+00	-6.04-37	-6.41-36	-2.13-35	-5.31-35	-1.12-34	-2.13-34	-3.72-34	-6.12-34	-9.75-34	-1.54-33	-2.51-33	-4.35-33	-8.26-33
21	0.00+00	-4.44-37	-6.33-36	-2.14-35	-5.34-35	-1.12-34	-2.11-34	-3.60-34	-5.75-34	-8.73-34	-1.29-33	-1.96-33	-3.23-33	-6.20-33
20	0.00+00	-2.15-37	-6.11-36	-2.11-35	-5.28-35	-1.11-34	-2.04-34	-3.38-34	-5.08-34	-6.94-34	-8.48-34	-9.05-34	-8.09-34	-8.18-34
19	0.00+00	1.12-37	-5.65-36	-2.02-35	-5.08-35	-1.05-34	-1.89-34	-2.97-34	-3.93-34	-3.85-34	-3.96-35	1.17-33	4.55-33	1.36-32
18	0.00+00	5.79-37	-4.83-36	-1.84-35	-4.65-35	-9.51-35	-1.63-34	-2.25-34	-1.97-34	1.55-34	1.46-33	5.41-33	1.48-32	5.74-32
17	0.00+00	1.23-36	-3.50-36	-1.51-35	-3.89-35	-7.69-35	-1.18-34	-1.05-34	1.35-34	1.12-33	4.38-33	1.49-32	5.31-32	2.37-31
16	0.00+00	2.15-36	-1.45-36	-9.93-36	-2.62-35	-4.67-35	-4.30-35	9.24-35	7.07-34	2.91-33	1.09-32	3.96-32	1.67-31	1.78-30
15	0.00+00	3.39-36	1.53-36	-1.95-36	-6.24-36	1.89-36	7.92-35	4.28-34	1.74-33	6.93-33	2.57-32	1.26-31	1.24-30	
14	0.00+00	5.06-36	5.74-36	9.91-36	2.49-35	8.10-35	2.87-34	1.04-33	3.81-33	1.52-32	7.64-32	7.50-31		
13	0.00+00	7.27-36	1.16-35	2.76-35	7.46-35	2.16-34	6.69-34	2.27-33	8.72-33	4.30-32	4.10-31			
12	0.00+00	1.02-35	1.99-35	5.49-35	1.59-34	4.67-34	1.46-33	5.24-33	2.42-32	2.09-31				
11	0.00+00	1.44-35	3.22-35	9.99-35	3.15-34	1.00-33	3.48-33	1.51-32	1.14-31					
10	0.00+00	2.06-35	5.18-35	1.82-34	6.49-34	2.41-33	1.06-32	7.59-32						
9	0.00+00	3.06-35	8.69-35	3.56-34	1.54-33	7.65-33	6.12-32							
8	0.00+00	4.86-35	1.60-34	8.19-34	4.98-33	5.03-32								
7	0.00+00	8.51-35	3.50-34	2.62-33	3.56-32									
6	0.00+00	1.75-34	1.07-33	1.94-32										
5	0.00+00	4.81-34	7.44-33											
4	0.00+00	2.72-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-4.13-33	-5.89-33	-8.30-33	-1.15-32	-1.59-32	-2.16-32	-2.92-32	-3.92-32	-5.22-32	-6.91-32	-9.08-32	-1.19-31	-1.54-31	-1.98-31
45	-5.85-33	-8.48-33	-1.21-32	-1.72-32	-2.42-32	-3.37-32	-4.67-32	-6.43-32	-8.81-32	-1.20-31	-1.64-31	-2.22-31	-3.01-31	-4.06-31
40	-8.30-33	-1.23-32	-1.81-32	-2.64-32	-3.82-32	-5.51-32	-7.92-32	-1.14-31	-1.63-31	-2.35-31	-3.39-31	-4.92-31	-7.18-31	-1.06-30
35	-1.12-32	-1.72-32	-2.60-32	-4.03-32	-6.14-32	-9.39-32	-1.44-31	-2.24-31	-3.50-31	-5.56-31	-9.03-31	-1.51-30	-2.60-30	-4.72-30
30	-1.37-32	-2.24-32	-3.69-32	-6.14-32	-1.03-31	-1.77-31	-3.13-31	-5.73-31	-1.11-30	-2.30-30	-5.35-30	-1.49-29	-5.72-29	-4.86-28
29	-1.41-32	-2.36-32	-3.97-32	-6.77-32	-1.18-31	-2.10-31	-3.89-31	-7.59-31	-1.60-30	-3.75-30	-1.05-29	-4.12-29	-3.55-28	
28	-1.46-32	-2.49-32	-4.31-32	-7.59-32	-1.37-31	-2.57-31	-5.07-31	-1.08-30	-2.56-30	-7.27-30	-2.87-29	-2.51-28		
27	-1.51-32	-2.65-32	-4.74-32	-8.69-32	-1.65-31	-3.30-31	-7.08-31	-1.70-30	-4.88-30	-1.95-29	-1.72-28			
26	-1.58-32	-2.85-32	-5.31-32	-1.02-31	-2.07-31	-4.52-31	-1.10-30	-3.18-30	-1.28-29	-1.15-28				
25	-1.65-32	-3.11-32	-6.09-32	-1.25-31	-2.78-31	-6.84-31	-2.01-30	-8.22-30	-1.43-29					
24	-1.74-32	-3.42-32	-7.17-32	-1.62-31	-4.07-31	-1.22-30	-5.06-30	-4.64-29						
23	-1.78-32	-3.78-32	-8.73-32	-2.25-31	-6.92-31	-2.94-30	-2.75-29							
22	-1.74-32	-4.11-32	-1.10-31	-3.50-31	-1.55-30	-1.50-29								
21	-1.44-32	-4.03-32	-1.39-31	-6.61-31	-6.89-30									
20	-2.86-33	-1.84-32	-1.37-31	-1.93-30										
19	1.94-32	1.84-31	7.90-31											
18	2.36-31	1.98-30												
17	2.34-30													

HE + TE = 3.00+03 NE = 1.00+08 CASE B NC = 34

TOTAL RC = 4.767-12 4-3 RC = 1.078-12 4-3 LM = 4.569-24 2S RC = 1.250-12 2P RC = 3.516-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.13-02	3.48-03	1.49-03	7.74-04	4.52-04	2.86-04	1.92-04	1.36-04	9.92-05	7.47-05	5.76-05	4.54-05	3.64-05	2.96-05
45	1.56-02	4.79-03	2.06-03	1.07-03	6.22-04	3.94-04	2.65-04	1.87-04	1.37-04	1.03-04	7.94-05	6.25-05	5.01-05	4.08-05
40	2.21-02	6.79-03	2.92-03	1.51-03	8.82-04	5.58-04	3.76-04	2.65-04	1.93-04	1.46-04	1.12-04	8.85-05	7.09-05	5.77-05
35	3.20-02	9.82-03	4.22-03	2.19-03	1.27-03	8.07-04	5.43-04	3.82-04	2.79-04	2.10-04	1.62-04	1.28-04	1.02-04	8.32-05
30	4.50-02	1.38-02	5.93-03	3.07-03	1.79-03	1.14-03	7.64-04	5.38-04	3.93-04	2.96-04	2.28-04	1.80-04	1.44-04	1.17-04
29	4.77-02	1.46-02	6.29-03	3.26-03	1.90-03	1.20-03	8.10-04	5.71-04	4.17-04	3.14-04	2.42-04	1.91-04	1.53-04	1.24-04
28	5.03-02	1.54-02	6.64-03	3.44-03	2.01-03	1.27-03	8.55-04	6.02-04	4.40-04	3.31-04	2.56-04	2.01-04	1.61-04	1.31-04
27	5.27-02	1.62-02	6.96-03	3.60-03	2.10-03	1.33-03	8.96-04	6.31-04	4.61-04	3.47-04	2.68-04	2.11-04	1.69-04	1.37-04
26	5.48-02	1.68-02	7.24-03	3.75-03	2.19-03	1.39-03	9.33-04	6.57-04	4.80-04	3.62-04	2.79-04	2.19-04	1.76-04	1.43-04
25	5.66-02	1.74-02	7.48-03	3.87-03	2.26-03	1.43-03	9.64-04	6.80-04	4.97-04	3.74-04	2.88-04	2.27-04	1.82-04	1.48-04
24	5.81-02	1.78-02	7.68-03	3.98-03	2.32-03	1.47-03	9.92-04	6.99-04	5.11-04	3.85-04	2.97-04	2.33-04	1.87-04	1.52-04
23	5.95-02	1.83-02	7.87-03	4.08-03	2.38-03	1.51-03	1.02-03	7.17-04	5.24-04	3.95-04	3.04-04	2.40-04	1.92-04	1.56-04
22	6.10-02	1.88-02	8.08-03	4.19-03	2.45-03	1.55-03	1.05-03	7.38-04	5.40-04	4.06-04	3.13-04	2.47-04	1.97-04	1.60-04
21	6.29-02	1.94-02	8.35-03	4.34-03	2.54-03	1.61-03	1.08-03	7.65-04	5.60-04	4.21-04	3.25-04	2.56-04	2.04-04	1.66-04
20	6.55-02	2.02-02	8.72-03	4.53-03	2.65-03	1.69-03	1.14-03	8.03-04	5.88-04	4.43-04	3.41-04	2.68-04	2.15-04	1.74-04
19	6.91-02	2.13-02	9.23-03	4.81-03	2.82-03	1.79-03	1.21-03	8.55-04	6.26-04	4.72-04	3.64-04	2.86-04	2.29-04	1.86-04
18	7.37-02	2.28-02	9.90-03	5.17-03	3.04-03	1.94-03	1.31-03	9.27-04	6.79-04	5.12-04	3.95-04	3.11-04	2.49-04	1.99-04
17	7.95-02	2.47-02	1.08-02	5.64-03	3.33-03	2.13-03	1.44-03	1.02-03	7.50-04	5.66-04	4.37-04	3.43-04	2.72-04	2.15-04
16	8.65-02	2.70-02	1.18-02	6.24-03	3.70-03	2.37-03	1.61-03	1.15-03	8.45-04	6.38-04	4.92-04	3.85-04	3.01-04	2.25-04
15	9.45-02	2.98-02	1.32-02	7.00-03	4.18-03	2.70-03	1.84-03	1.32-03	9.72-04	7.35-04	5.66-04	4.36-04	3.23-04	
14	1.04-01	3.31-02	1.48-02	7.98-03	4.81-03	3.13-03	2.16-03	1.55-03	1.15-03	8.66-04	6.60-04	4.83-04		
13	1.13-01	3.70-02	1.69-02	9.25-03	5.66-03	3.73-03	2.59-03	1.87-03	1.39-03	1.04-03	7.54-04			
12	1.24-01	4.18-02	1.96-02	1.10-02	6.86-03	4.59-03	3.22-03	2.34-03	1.73-03	1.24-03				
11	1.36-01	4.80-02	2.34-02	1.35-02	8.63-03	5.88-03	4.17-03	3.03-03	2.13-03					
10	1.53-01	5.68-02	2.84-02	1.70-02	1.14-02	7.88-03	5.60-03	3.88-03						
9	1.80-01	7.07-02	3.81-02	2.37-02	1.58-02	1.10-02	7.50-03							
8	2.29-01	9.42-02	5.35-02	3.43-02	2.33-02	1.56-02								
7	3.23-01	1.38-01	8.16-02	5.36-02	3.53-02									
6	5.11-01	2.26-01	1.38-01	8.94-02										
5	9.28-01	4.29-01	2.65-01											
4	2.07+00	1.00+00												
3	6.67+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.44-05	2.04-05	1.72-05	1.46-05	1.25-05	1.08-05	9.42-06	8.24-06	7.25-06	6.42-06	5.70-06	5.09-06	4.56-06	4.11-06
45	3.36-05	2.80-05	2.36-05	2.01-05	1.72-05	1.49-05	1.29-05	1.13-05	9.97-06	8.81-06	7.83-06	6.99-06	6.26-06	5.63-06
40	4.76-05	3.97-05	3.34-05	2.84-05	2.44-05	2.10-05	1.83-05	1.60-05	1.41-05	1.24-05	1.10-05	9.84-06	8.80-06	7.91-06
35	6.86-05	5.72-05	4.82-05	4.09-05	3.51-05	3.02-05	2.63-05	2.29-05	2.02-05	1.78-05	1.58-05	1.40-05	1.25-05	1.12-05
30	9.64-05	8.03-05	6.76-05	5.76-05	4.91-05	4.23-05	3.67-05	3.19-05	2.79-05	2.45-05	2.15-05	1.88-05	1.63-05	1.33-05
29	1.02-04	8.52-05	7.17-05	6.08-05	5.20-05	4.48-05	3.88-05	3.37-05	2.94-05	2.57-05	2.24-05	1.93-05	1.57-05	
28	1.08-04	8.98-05	7.55-05	6.41-05	5.47-05	4.71-05	4.07-05	3.53-05	3.07-05	2.67-05	2.28-05	1.85-05		
27	1.13-04	9.40-05	7.90-05	6.70-05	5.72-05	4.91-05	4.24-05	3.67-05	3.17-05	2.70-05	2.18-05			
26	1.17-04	9.78-05	8.21-05	6.96-05	5.93-05	5.08-05	4.37-05	3.75-05	3.19-05	2.56-05				
25	1.21-04	1.01-04	8.47-05	7.17-05	6.10-05	5.21-05	4.45-05	3.76-05	3.08-05					
24	1.25-04	1.04-04	8.69-05	7.34-05	6.22-05	5.28-05	4.43-05	3.52-05						
23	1.28-04	1.06-04	8.86-05	7.47-05	6.29-05	5.25-05	4.15-05							
22	1.31-04	1.09-04	9.08-05	7.59-05	6.28-05	4.94-05								
21	1.36-04	1.12-04	9.29-05	7.64-05	5.97-05									
20	1.42-04	1.16-04	9.49-05	7.36-05										
19	1.50-04	1.21-04	9.31-05											
18	1.59-04	1.21-04												
17	1.62-04													

HE + TE = 3.00+03 NE = 1.00+08 CASE B NC = 34

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-6.92-37	-3.35-36	-1.05-35	-2.65-35	-5.77-35	-1.14-34	-2.08-34	-3.59-34	-5.93-34	-9.41-34	-1.45-33	-2.17-33	-3.16-33
45	0.00+00	-9.58-37	-4.64-36	-1.46-35	-3.70-35	-8.11-35	-1.61-34	-2.96-34	-5.15-34	-8.57-34	-1.37-33	-2.14-33	-3.23-33	-4.78-33
40	0.00+00	-1.36-36	-6.63-36	-2.10-35	-5.34-35	-1.18-34	-2.35-34	-4.38-34	-7.70-34	-1.30-33	-2.11-33	-3.33-33	-5.13-33	-7.73-33
35	0.00+00	-1.96-36	-9.65-36	-3.08-35	-7.88-35	-1.76-34	-3.55-34	-6.69-34	-1.19-33	-2.05-33	-3.40-33	-5.50-33	-8.70-33	-1.35-32
30	0.00+00	-2.67-36	-1.35-35	-4.34-35	-1.13-34	-2.54-34	-5.23-34	-1.00-33	-1.84-33	-3.25-33	-5.27-33	-9.36-33	-1.55-32	-2.53-32
29	0.00+00	-2.79-36	-1.42-35	-4.60-35	-1.20-34	-2.71-34	-5.59-34	-1.08-33	-1.99-33	-3.54-33	-6.13-33	-1.04-32	-1.78-32	-2.89-32
28	0.00+00	-2.89-36	-1.49-35	-4.84-35	-1.26-34	-2.87-34	-5.94-34	-1.15-33	-2.14-33	-3.84-33	-6.71-33	-1.15-32	-1.96-32	-3.30-32
27	0.00+00	-2.95-36	-1.55-35	-5.03-35	-1.32-34	-3.00-34	-6.25-34	-1.22-33	-2.28-33	-4.13-33	-7.31-33	-1.27-32	-2.20-32	-3.77-32
26	0.00+00	-2.96-36	-1.59-35	-5.19-35	-1.36-34	-3.11-34	-6.51-34	-1.28-33	-2.41-33	-4.41-33	-7.91-33	-1.40-32	-2.46-32	-4.31-32
25	0.00+00	-2.92-36	-1.61-35	-5.28-35	-1.39-34	-3.19-34	-6.70-34	-1.33-33	-2.52-33	-4.67-33	-8.49-33	-1.53-32	-2.78-32	-4.94-32
24	0.00+00	-2.82-36	-1.61-35	-5.32-35	-1.40-34	-3.24-34	-6.83-34	-1.36-33	-2.61-33	-4.90-33	-9.06-33	-1.67-32	-3.07-32	-5.70-32
23	0.00+00	-2.67-36	-1.60-35	-5.31-35	-1.41-34	-3.25-34	-6.89-34	-1.38-33	-2.68-33	-5.11-33	-9.63-33	-1.81-32	-3.40-32	-6.64-32
22	0.00+00	-2.48-36	-1.57-35	-5.28-35	-1.40-34	-3.25-34	-6.91-34	-1.40-33	-2.74-33	-5.31-33	-1.02-32	-1.99-32	-3.91-32	-7.91-32
21	0.00+00	-2.25-36	-1.55-35	-5.25-35	-1.40-34	-3.25-34	-6.94-34	-1.41-33	-2.81-33	-5.55-33	-1.10-32	-2.21-32	-4.56-32	-9.80-32
20	0.00+00	-2.00-36	-1.53-35	-5.25-35	-1.40-34	-3.26-34	-7.00-34	-1.44-33	-2.90-33	-5.87-33	-1.20-32	-2.53-32	-5.53-32	-1.29-31
19	0.00+00	-1.71-36	-1.52-35	-5.28-35	-1.42-34	-3.31-34	-7.13-34	-1.48-33	-3.04-33	-6.31-33	-1.35-32	-3.01-32	-7.15-32	-1.88-31
18	0.00+00	-1.37-36	-1.52-35	-5.36-35	-1.45-34	-3.38-34	-7.33-34	-1.54-33	-3.22-33	-6.94-33	-1.57-32	-3.79-32	-1.02-31	-3.23-31
17	0.00+00	-9.40-37	-1.52-35	-5.47-35	-1.48-34	-3.49-34	-7.58-34	-1.61-33	-3.45-33	-7.79-33	-1.90-32	-5.16-32	-1.67-31	-7.48-31
16	0.00+00	-3.40-37	-1.49-35	-5.56-35	-1.52-34	-3.59-34	-7.83-34	-1.67-33	-3.70-33	-8.86-33	-2.41-32	-7.90-32	-3.61-31	-3.60-30
15	0.00+00	5.38-37	-1.42-35	-5.55-35	-1.54-34	-3.64-34	-7.91-34	-1.70-33	-3.83-33	-9.92-33	-4.19-32	-1.48-31	-1.52-30	
14	0.00+00	1.87-36	-1.26-35	-5.31-35	-1.50-34	-3.53-34	-7.51-34	-1.65-33	-3.83-33	-9.50-33	-4.07-32	-1.35-31		
13	0.00+00	3.93-36	-9.24-36	-4.61-35	-1.33-34	-3.05-34	-6.82-34	-9.03-34	-7.47-34	3.00-33	4.81-32			
12	0.00+00	7.16-36	-2.84-36	-3.03-35	-9.09-35	-1.71-34	-6.68-34	1.48-33	1.39-32	1.80-31				
11	0.00+00	1.22-35	8.64-36	2.03-36	6.70-36	1.75-34	1.52-33	1.18-32	1.57-31					
10	0.00+00	2.01-35	2.88-35	6.68-35	2.33-34	1.14-33	7.64-33	9.63-32						
9	0.00+00	3.27-35	6.50-35	2.06-34	8.43-34	4.82-33	5.52-32							
8	0.00+00	5.41-35	1.37-34	5.66-34	3.15-33	3.38-32								
7	0.00+00	9.55-35	3.15-34	1.92-33	2.27-32									
6	0.00+00	1.95-34	9.53-34	1.39-32										
5	0.00+00	5.28-34	6.32-33											
4	0.00+00	2.89-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-4.51-33	-6.32-33	-8.68-33	-1.17-32	-1.55-32	-2.00-32	-2.53-32	-3.12-32	-3.76-32	-4.42-32	-5.10-32	-5.78-32	-6.45-32	-7.10-32
45	-6.93-33	-9.86-33	-1.38-32	-1.89-32	-2.56-32	-3.39-32	-4.39-32	-5.58-32	-6.94-32	-8.48-32	-1.02-31	-1.21-31	-1.41-31	-1.65-31
40	-1.14-32	-1.67-32	-2.39-32	-3.32-32	-4.52-32	-6.08-32	-8.05-32	-1.16-31	-1.52-31	-1.96-31	-2.51-31	-3.20-31	-4.08-31	-5.22-31
35	-2.07-32	-3.13-32	-4.69-32	-6.95-32	-1.02-31	-1.49-31	-2.16-31	-3.09-31	-4.43-31	-6.34-31	-9.15-31	-1.35-30	-2.04-30	-3.25-30
30	-4.10-32	-6.63-32	-1.07-31	-1.73-31	-2.83-31	-4.65-31	-7.76-31	-1.32-30	-2.34-30	-4.40-30	-9.11-30	-2.23-29	-7.53-29	-5.59-28
29	-4.76-32	-7.84-32	-1.30-31	-2.16-31	-3.64-31	-6.24-31	-1.09-30	-1.99-30	-3.83-30	-8.14-30	-2.04-29	-7.01-29	-5.29-28	
28	-5.54-32	-9.34-32	-1.59-31	-2.73-31	-4.79-31	-8.64-31	-1.61-30	-3.20-30	-6.99-30	-1.79-29	-6.32-29	-4.86-28		
27	-6.48-32	-1.12-31	-1.97-31	-3.53-31	-6.51-31	-1.25-30	-2.55-30	-5.73-30	-1.51-29	-4.46-29	-4.31-28			
26	-7.61-32	-1.36-31	-2.49-31	-4.68-31	-9.22-31	-1.93-30	-4.47-30	-1.21-29	-4.51-29	-3.65-28				
25	-9.01-32	-1.68-31	-3.22-31	-6.46-31	-1.39-30	-3.30-30	-9.23-30	-3.53-29	-2.95-28					
24	-1.08-31	-2.11-31	-4.31-31	-9.46-31	-2.30-30	-6.61-30	-2.61-29	-2.24-28						
23	-1.32-31	-2.75-31	-6.12-31	-1.52-30	-4.47-30	-1.81-29	-1.61-28							
22	-1.67-31	-3.79-31	-9.55-31	-2.87-30	-1.19-29	-1.08-28								
21	-2.25-31	-5.76-31	-1.75-30	-7.40-30	-6.88-29									
20	-3.35-31	-1.03-30	-4.42-30	-4.18-29										
19	-5.90-31	-2.55-30	-2.44-29											
18	-1.42-30	-1.37-29												
17	-7.37-30													

HE + TE = 3.00+03 NE = 1.00+09 CASE B NC = 22

TOTAL RC = 5.871-12 4-3 RC = 1.156-12 4-3 EM = 4.897-24 2S RC = 1.627-12 2P RC = 4.744-12

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.07-02	3.29-03	1.42-03	7.33-04	4.28-04	2.71-04	1.82-04	1.28-04	9.39-05	7.07-05	5.46-05	4.30-05	3.45-05	2.80-05
45	1.50-02	4.59-03	1.97-03	1.02-03	5.96-04	3.78-04	2.54-04	1.79-04	1.31-04	9.86-05	7.61-05	5.99-05	4.80-05	3.91-05
40	2.18-02	6.68-03	2.87-03	1.49-03	8.67-04	5.49-04	3.69-04	2.60-04	1.90-04	1.43-04	1.10-04	8.70-05	6.97-05	5.67-05
35	3.33-02	1.02-02	4.39-03	2.27-03	1.33-03	8.39-04	5.65-04	3.98-04	2.91-04	2.19-04	1.69-04	1.33-04	1.06-04	8.66-05
30	5.39-02	1.65-02	7.11-03	3.68-03	2.15-03	1.36-03	9.13-04	6.43-04	4.70-04	3.54-04	2.73-04	2.14-04	1.72-04	1.40-04
29	5.98-02	1.83-02	7.88-03	4.08-03	2.38-03	1.50-03	1.01-03	7.13-04	5.20-04	3.92-04	3.02-04	2.37-04	1.90-04	1.54-04
28	6.63-02	2.03-02	8.74-03	4.52-03	2.64-03	1.67-03	1.12-03	7.90-04	5.77-04	4.34-04	3.35-04	2.63-04	2.11-04	1.71-04
27	7.37-02	2.26-02	9.70-03	5.02-03	2.93-03	1.85-03	1.25-03	8.77-04	6.41-04	4.82-04	3.71-04	2.92-04	2.34-04	1.90-04
26	8.18-02	2.51-02	1.08-02	5.58-03	3.25-03	2.06-03	1.38-03	9.73-04	7.11-04	5.34-04	4.12-04	3.24-04	2.59-04	2.10-04
25	9.07-02	2.78-02	1.19-02	6.18-03	3.60-03	2.28-03	1.53-03	1.08-03	7.87-04	5.92-04	4.56-04	3.58-04	2.87-04	2.33-04
24	1.00-01	3.07-02	1.32-02	6.83-03	3.98-03	2.52-03	1.69-03	1.19-03	8.69-04	6.53-04	5.03-04	3.95-04	3.16-04	2.56-04
23	1.10-01	3.38-02	1.45-02	7.50-03	4.37-03	2.76-03	1.86-03	1.31-03	9.54-04	7.17-04	5.52-04	4.33-04	3.46-04	2.80-04
22	1.19-01	3.65-02	1.57-02	8.11-03	4.73-03	2.99-03	2.01-03	1.41-03	1.03-03	7.76-04	5.97-04	4.69-04	3.74-04	3.03-04
21	1.28-01	3.92-02	1.68-02	8.72-03	5.08-03	3.22-03	2.16-03	1.52-03	1.11-03	8.34-04	6.41-04	5.03-04	4.02-04	3.25-04
20	1.35-01	4.15-02	1.78-02	9.24-03	5.38-03	3.41-03	2.29-03	1.61-03	1.17-03	8.82-04	6.78-04	5.32-04	4.26-04	3.42-04
19	1.41-01	4.33-02	1.86-02	9.62-03	5.61-03	3.55-03	2.38-03	1.68-03	1.22-03	9.18-04	7.05-04	5.52-04	4.39-04	3.53-04
18	1.45-01	4.48-02	1.91-02	9.86-03	5.76-03	3.64-03	2.45-03	1.72-03	1.25-03	9.41-04	7.22-04	5.65-04	4.47-04	3.57-04
17	1.47-01	4.52-02	1.94-02	1.01-02	5.87-03	3.71-03	2.50-03	1.75-03	1.28-03	9.58-04	7.34-04	5.72-04	4.50-04	3.54-04
16	1.50-01	4.62-02	1.99-02	1.03-02	6.01-03	3.81-03	2.56-03	1.80-03	1.31-03	9.79-04	7.48-04	5.79-04	4.48-04	3.32-04
15	1.56-01	4.80-02	2.07-02	1.07-02	6.27-03	3.97-03	2.67-03	1.88-03	1.36-03	1.02-03	7.73-04	5.89-04	4.30-04	
14	1.66-01	5.12-02	2.21-02	1.15-02	6.72-03	4.26-03	2.87-03	2.01-03	1.46-03	1.08-03	8.11-04	5.83-04		
13	1.81-01	5.60-02	2.43-02	1.27-02	7.42-03	4.71-03	3.17-03	2.21-03	1.61-03	1.18-03	8 32-04			
12	2.02-01	6.28-02	2.74-02	1.43-02	8.44-03	5.38-03	3.62-03	2.54-03	1.81-03	1.26-03				
11	2.29-01	7.20-02	3.17-02	1.68-02	9.94-03	6.36-03	4.29-03	2.98-03	2.02-03					
10	2.64-01	8.44-02	3.78-02	2.03-02	1.22-02	7.84-03	5.27-03	3.49-03						
9	3.09-01	1.02-01	4.68-02	2.57-02	1.57-02	1.02-02	6.56-03							
8	3.70-01	1.28-01	6.14-02	3.48-02	2.16-02	1.36-02								
7	4.69-01	1.72-01	8.76-02	5.14-02	3.12-02									
6	6.66-01	2.61-01	1.40-01	8.16-02										
5	1.13+00	4.63-01	2.51-01											
4	2.41+00	1.00+00												
3	7.29+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.31-05	1.93-05	1.63-05	1.38-05	1.19-05	1.03-05	8.92-06	7.81-06	6.87-06	6.08-06	5.40-06	4.82-06	4.32-06	3.89-06
45	3.22-05	2.69-05	2.27-05	1.93-05	1.65-05	1.43-05	1.24-05	1.09-05	9.55-06	8.45-06	7.51-06	6.70-06	6.00-06	5.39-06
40	4.68-05	3.90-05	3.29-05	2.79-05	2.40-05	2.07-05	1.80-05	1.57-05	1.38-05	1.22-05	1.08-05	9.67-06	8.65-06	7.77-06
35	7.13-05	5.95-05	5.01-05	4.26-05	3.65-05	3.15-05	2.73-05	2.39-05	2.10-05	1.85-05	1.64-05	1.46-05	1.30-05	1.16-05
30	1.15-04	9.57-05	8.05-05	6.84-05	5.85-05	5.04-05	4.36-05	3.80-05	3.32-05	2.91-05	2.56-05	2.24-05	1.93-05	1.57-05
29	1.27-04	1.06-04	8.91-05	7.56-05	6.46-05	5.56-05	4.81-05	4.18-05	3.65-05	3.19-05	2.77-05	2.39-05	1.94-05	
28	1.41-04	1.17-04	9.86-05	8.36-05	7.14-05	6.14-05	5.30-05	4.60-05	4.00-05	3.46-05	2.96-05	2.40-05		
27	1.56-04	1.30-04	1.09-04	9.24-05	7.89-05	6.77-05	5.84-05	5.04-05	4.35-05	3.70-05	2.98-05			
26	1.73-04	1.44-04	1.21-04	1.02-04	8.70-05	7.45-05	6.40-05	5.48-05	4.65-05	3.73-05				
25	1.91-04	1.59-04	1.33-04	1.12-04	9.56-05	8.19-05	6.95-05	5.86-05	4.67-05					
24	2.10-04	1.75-04	1.46-04	1.23-04	1.04-04	8.83-05	7.39-05	5.86-05						
23	2.30-04	1.91-04	1.59-04	1.34-04	1.12-04	9.34-05	7.36-05							
22	2.49-04	2.06-04	1.71-04	1.43-04	1.18-04	9.24-05								
21	2.66-04	2.19-04	1.81-04	1.48-04	1.15-04									
20	2.79-04	2.28-04	1.85-04	1.43-04										
19	2.86-04	2.30-04	1.76-04											
18	2.84-04	2.16-04												
17	2.65-04													

HE + TE = 3.00+03 NE = 1.00+09 CASE B NC = 22

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-6.52-37	-3.31-36	-1.05-35	-2.65-35	-5.78-35	-1.14-34	-2.07-34	-3.54-34	-5.76-34	-8.94-34	-1.33-33	-1.91-33	-2.61-33
45	0.00+00	-9.19-37	-4.66-36	-1.48-35	-3.76-35	-8.24-35	-1.63-34	-2.99-34	-5.16-34	-8.47-34	-1.33-33	-2.01-33	-2.91-33	-4.05-33
40	0.00+00	-1.35-36	-6.86-36	-2.19-35	-5.59-35	-1.24-34	-2.47-34	-4.57-34	-7.98-34	-1.33-33	-2.11-33	-3.24-33	-4.79-33	-6.82-33
35	0.00+00	-2.11-36	-1.07-35	-3.43-35	-8.83-35	-1.97-34	-3.99-34	-7.51-34	-1.33-33	-2.26-33	-3.68-33	-5.80-33	-8.83-33	-1.30-32
30	0.00+00	-3.48-36	-1.77-35	-5.75-35	-1.50-34	-3.41-34	-7.03-34	-1.35-33	-2.47-33	-4.32-33	-7.29-33	-1.20-32	-1.91-32	-2.97-32
29	0.00+00	-3.87-36	-1.97-35	-6.42-35	-1.68-34	-3.84-34	-7.96-34	-1.54-33	-2.83-33	-5.00-33	-8.52-33	-1.42-32	-2.29-32	-3.62-32
28	0.00+00	-4.30-36	-2.20-35	-7.19-35	-1.89-34	-4.33-34	-9.04-34	-1.76-33	-3.27-33	-5.82-33	-1.00-32	-1.69-32	-2.77-32	-4.46-32
27	0.00+00	-4.79-36	-2.46-35	-8.05-35	-2.13-34	-4.90-34	-1.03-33	-2.02-33	-3.78-33	-6.81-33	-1.19-32	-2.03-32	-3.40-32	-5.58-32
26	0.00+00	-5.32-36	-2.74-35	-9.02-35	-2.39-34	-5.55-34	-1.17-33	-2.33-33	-4.40-33	-8.02-33	-1.42-32	-2.47-32	-4.22-32	-7.09-32
25	0.00+00	-5.89-36	-3.05-35	-1.01-34	-2.69-34	-6.29-34	-1.34-33	-2.69-33	-5.14-33	-9.50-33	-1.71-32	-3.03-32	-5.30-32	-9.17-32
24	0.00+00	-6.49-36	-3.39-35	-1.13-34	-3.02-34	-7.11-34	-1.53-33	-3.10-33	-6.01-33	-1.13-32	-2.08-32	-3.76-32	-6.77-32	-1.21-31
23	0.00+00	-7.07-36	-3.74-35	-1.25-34	-3.38-34	-8.01-34	-1.74-33	-3.58-33	-7.04-33	-1.35-32	-2.53-32	-4.72-32	-8.78-32	-1.64-31
22	0.00+00	-7.50-36	-4.03-35	-1.36-34	-3.70-34	-8.87-34	-1.95-33	-4.07-33	-8.16-33	-1.60-32	-3.08-32	-5.94-32	-1.15-31	-2.27-31
21	0.00+00	-7.87-36	-4.32-35	-1.47-34	-4.04-34	-9.78-34	-2.19-33	-4.63-33	-9.48-33	-1.90-32	-3.80-32	-7.63-32	-1.56-31	-3.28-31
20	0.00+00	-8.02-36	-4.54-35	-1.56-34	-4.33-34	-1.06-33	-2.41-33	-5.21-33	-1.09-32	-2.27-32	-4.71-32	-9.94-32	-2.17-31	-4.99-31
19	0.00+00	-7.86-36	-4.65-35	-1.62-34	-4.55-34	-1.13-33	-2.61-33	-5.77-33	-1.25-32	-2.69-32	-5.87-32	-1.32-31	-3.16-31	-8.25-31
18	0.00+00	-7.35-36	-4.64-35	-1.64-34	-4.67-34	-1.18-33	-2.78-33	-6.31-33	-1.42-32	-3.20-32	-7.46-32	-1.83-31	-4.95-31	-1.57-30
17	0.00+00	-6.49-36	-4.53-35	-1.63-34	-4.71-34	-1.21-33	-2.92-33	-6.87-33	-1.61-32	-3.87-32	-9.18-32	-2.72-31	-8.92-31	-4.01-30
16	0.00+00	-5.37-36	-4.38-35	-1.62-34	-4.74-34	-1.24-33	-3.09-33	-7.56-33	-1.88-32	-4.89-32	-1.39-31	-4.68-31	-2.16-30	-2.18-29
15	0.00+00	-4.05-36	-4.23-35	-1.61-34	-4.82-34	-1.29-33	-3.33-33	-8.60-33	-2.31- 2	-6.75-32	-2.32-31	-1.09-30	-1.13-29	
14	0.00+00	-2.48-36	-4.13-35	-1.64-34	-5.01-34	-1.39-33	-3.74-33	-1.04-32	-3.12-2	-1.10-31	-5.26-31	-5.53-30		
13	0.00+00	-4.78-37	-4.05-35	-1.69-34	-5.36-34	-1.54-33	-4.44-33	-1.37-32	-4.93-32	-2.42-31	-2.58-30			
12	0.00+00	2.38-36	-3.94-35	-1.78-34	-5.86-34	-1.78-33	-5.63-33	-2.06-32	-1.03-31	-1.12-30				
11	0.00+00	6.86-36	-3.62-35	-1.85-34	-6.46-34	-2.11-33	-7.72-33	-3.85-32	-4.23-31					
10	0.00+00	1.45-35	-2.73-35	-1.80-34	-6.85-34	-2.47-33	-1.14-32	-1.17-31						
9	0.00+00	2.92-35	-4.20-36	-1.33-34	-5.58-34	-1.89-33	-7.70-33							
8	0.00+00	5.43-35	5.52-35	6.70-35	5.95-34	1 58-32								
7	0.00+00	1.08-34	2.18-34	9.72-34	1.39-32									
6	0.00+00	2.33-34	7.99-34	9.23-33										
5	0.00+00	6.34-34	5.39-33											
4	0.00+00	3.34-33												
3	0.00+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-3.40-33	-4.16-33	-4.74-33	-4.96-33	-4.70-33	-3.86-33	-2.38-33	9.49-36	5.09-33	7.11-33	1.22-32	1.87-32	2.68-32	3.71-32
45	-5.36-33	-6.70-33	-7.83-33	-8.09-33	-8.04-33	-7.50-33	-5.52-33	-1.99-33	2.83-33	9.49-33	1.84-32	3.00-32	4.63-32	6.78-32
40	-9.26-33	-1.19-32	-1.40-32	-1.46-32	-1.40-32	-1.20-32	-1.47-32	-9.61-33	-1.75-33	1.03-32	2.82-32	5.46-32	9.37-32	1.53-31
35	-1.83-32	-2.47-32	-3.17-32	-3.85-32	-4.44-32	-4.86-32	-5.01-32	-4.60-32	-3.58-32	-1.42-32	2.67-32	1.04-31	2.51-31	5.46-31
30	-4.48-32	-6.57-32	-9.14-32	-1.24-31	-1.64-31	-2.12-31	-2.73-31	-3.46-31	-4.44-31	-5.75-31	-7.43-31	-8.67-31	-7.27-32	1.91-29
29	-5.55-32	-8.26-32	-1.19-31	-1.66-31	-2.28-31	-3.11-31	-4.26-31	-5.87-31	-8.09-31	-1.31-30	-2.26-30	-4.79-30	-1.65-29	
28	-6.99-32	-1.07-31	-1.58-31	-2.30-31	-3.30-31	-4.76-31	-7.04-31	-1.08-30	-1.81-30	-3.51-30	-9.14-30	-4.93-29		
27	-8.96-32	-1.41-31	-2.16-31	-3.29-31	-4.99-31	-7.76-31	-1.26-30	-2.22-30	-4.61-30	-1.30-29	-7.95-29			
26	-1.17-31	-1.91-31	-3.06-31	-4.91-31	-7.99-31	-1.36-30	-2.53-30	-5.09-30	-1.63-29	-1.05-28				
25	-1.57-31	-2.66-31	-4.51-31	-7.75-31	-1.38-30	-2.68-30	-6.09-30	-1.89-29	-1.28-28					
24	-2.16-31	-3.87-31	-7.01-31	-1.32-30	-2.67-30	-6.30-30	-2.02-29	-1.43-28						
23	-3.08-31	-5.90-31	-1.17-30	-2.50-30	-6.16-30	-2.05-29	-1.46-28							
22	-4.56-31	-9.56-31	-2.15-30	-5.59-30	-1.95-29	-1.46-28								
21	-7.22-31	-1.72-30	-4.72-30	-1.73-29	-1.36-28									
20	-1.25-30	-3.63-30	-1.41-29	-1.16-28										
19	-2.52-30	-1.03-29	-9.05-29											
18	-6.79-30	-6.30-29												
17	-3.91-29													

HE + TE = 3.00+03 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 8.313-12 4-3 RC = 1.409-12 4-3 EM = 5.971-24 2S RC = 2.425-12 2P RC = 5.888-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.82-03	2.71-03	1.16-03	6.03-04	3.52-04	2.23-04	1.50-04	1.06-04	7.72-05	5.81-05	4.49-05	3.53-05	2.83-05	2.31-05
45	1.23-02	3.79-03	1.63-03	8.43-04	4.92-04	3.11-04	2.09-04	1.48-04	1.08-04	8.13-05	6.27-05	4.94-05	3.96-05	3.22-05
40	1.80-02	5.53-03	2.38-03	1.23-03	7.18-04	4.55-04	3.06-04	2.16-04	1.58-04	1.19-04	9.15-05	7.21-05	5.78-05	4.70-05
35	2.79-02	8.57-03	3.68-03	1.91-03	1.11-03	7.04-04	4.74-04	3.34-04	2.44-04	1.84-04	1.42-04	1.11-04	8.93-05	7.26-05
30	4.68-02	1.43-02	6.16-03	3.19-03	1.86-03	1.18-03	7.92-04	5.58-04	4.07-04	3.07-04	2.36-04	1.86-04	1.49-04	1.21-04
29	5.25-02	1.61-02	6.91-03	3.58-03	2.09-03	1.32-03	8.88-04	6.25-04	4.57-04	3.44-04	2.65-04	2.08-04	1.67-04	1.36-04
28	5.91-02	1.81-02	7.79-03	4.03-03	2.35-03	1.49-03	1.00-03	7.04-04	5.14-04	3.87-04	2.98-04	2.35-04	1.88-04	1.53-04
27	6.69-02	2.05-02	8.81-03	4.56-03	2.66-03	1.68-03	1.13-03	7.97-04	5.82-04	4.37-04	3.37-04	2.65-04	2.12-04	1.72-04
26	7.61-02	2.33-02	1.00-02	5.19-03	3.02-03	1.91-03	1.29-03	9.05-04	6.61-04	4.97-04	3.83-04	3.01-04	2.41-04	1.96-04
25	8.70-02	2.67-02	1.15-02	5.93-03	3.45-03	2.19-03	1.47-03	1.03-03	7.55-04	5.67-04	4.37-04	3.44-04	2.75-04	2.23-04
24	9.99-02	3.06-02	1.32-02	6.81-03	3.97-03	2.51-03	1.69-03	1.19-03	8.66-04	6.51-04	5.01-04	3.94-04	3.15-04	2.55-04
23	1.15-01	3.54-02	1.52-02	7.85-03	4.58-03	2.90-03	1.95-03	1.37-03	9.99-04	7.50-04	5.78-04	4.54-04	3.62-04	2.94-04
22	1.34-01	4.10-02	1.76-02	9.10-03	5.30-03	3.35-03	2.25-03	1.58-03	1.16-03	8.68-04	6.68-04	5.24-04	4.19-04	3.39-04
21	1.56-01	4.77-02	2.05-02	1.06-02	6.17-03	3.90-03	2.62-03	1.84-03	1.34-03	1.01-03	7.75-04	6.08-04	4.85-04	3.92-04
20	1.80-01	5.53-02	2.38-02	1.23-02	7.16-03	4.52-03	3.04-03	2.14-03	1.56-03	1.17-03	8.98-04	7.04-04	5.60-04	4.52-04
19	2.10-01	6.43-02	2.76-02	1.43-02	8.32-03	5.26-03	3.53-03	2.48-03	1.81-03	1.35-03	1.04-03	8.14-04	6.46-04	5.19-04
18	2.43-01	7.43-02	3.19-02	1.65-02	9.60-03	6.07-03	4.07-03	2.86-03	2.08-03	1.56-03	1.20-03	9.33-04	7.39-04	5.89-04
17	2.77-01	8.48-02	3.64-02	1.88-02	1.09-02	6.91-03	4.64-03	3.26-03	2.37-03	1.77-03	1.35-03	1.05-03	8.27-04	6.49-04
16	3.08-01	9.45-02	4.06-02	2.10-02	1.22-02	7.70-03	5.16-03	3.62-03	2.63-03	1.96-03	1.50-03	1.15-03	8.92-04	6.58-04
15	3.33-01	1.02-01	4.38-02	2.26-02	1.32-02	8.31-03	5.56-03	3.90-03	2.82-03	2.10-03	1.59-03	1.21-03	8.77-04	
14	3.46-01	1.06-01	4.55-02	2.35-02	1.37-02	8.63-03	5.77-03	4.03-03	2.91-03	2.15-03	1.60-03	1.15-03		
13	3.50-01	1.07-01	4.60-02	2.38-02	1.38-02	8.71-03	5.82-03	4.05-03	2.91-03	2.11-03	1.48-03			
12	3.54-01	1.09-01	4.66-02	2.41-02	1.40-02	8.80-03	5.86-03	4.06-03	2.87-03	1.96-03				
11	3.70-01	1.13-01	4.87-02	2.52-02	1.46-02	9.19-03	6.08-03	4.15-03	2.77-03					
10	4.05-01	1.25-01	5.36-02	2.77-02	1.61-02	1.01-02	6.58-03	4.24-03						
9	4.66-01	1.44-01	6.23-02	3.23-02	1.87-02	1.16-02	7.19-03							
8	5.63-01	1.76-01	7.66-02	4.00-02	2.31-02	1.36-02								
7	7.13-01	2.27-01	1.01-01	5.31-02	2.96-02									
6	9.66-01	3.18-01	1.46-01	7.57-02										
5	1.48+00	5.12-01	2.38-01											
4	2.87+00	1.00+00												
3	8.03+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.90-05	1.59-05	1.34-05	1.14-05	9.76-06	8.43-06	7.33-06	6.42-06	5.65-06	5.00-06	4.44-06	3.96-06	3.55-06	3.20-06
45	2.66-05	2.22-05	1.87-05	1.59-05	1.36-05	1.18-05	1.02-05	8.95-06	7.87-06	6.96-06	6.19-06	5.52-06	4.95-06	4.45-06
40	3.87-05	3.23-05	2.72-05	2.31-05	1.98-05	1.71-05	1.49-05	1.30-05	1.15-05	1.01-05	8.99-06	8.01-06	7.17-06	6.44-06
35	5.98-05	4.99-05	4.20-05	3.57-05	3.06-05	2.64-05	2.29-05	2.00-05	1.76-05	1.55-05	1.38-05	1.22-05	1.09-05	9.75-06
30	9.97-05	8.30-05	6.98-05	5.93-05	5.07-05	4.37-05	3.78-05	3.29-05	2.88-05	2.53-05	2.22-05	1.94-05	1.67-05	1.36-05
29	1.12-04	9.29-05	7.82-05	6.63-05	5.67-05	4.88-05	4.22-05	3.67-05	3.20-05	2.80-05	2.43-05	2.09-05	1.70-05	
28	1.26-04	1.04-04	8.78-05	7.45-05	6.36-05	5.47-05	4.72-05	4.10-05	3.56-05	3.09-05	2.64-05	2.14-05		
27	1.42-04	1.18-04	9.91-05	8.39-05	7.16-05	6.15-05	5.30-05	4.58-05	3.95-05	3.36-05	2.71-05			
26	1.61-04	1.34-04	1.12-04	9.50-05	8.09-05	6.93-05	5.95-05	5.10-05	4.32-05	3.46-05				
25	1.83-04	1.52-04	1.28-04	1.08-04	9.17-05	7.82-05	6.66-05	5.61-05	4.48-05					
24	2.10-04	1.74-04	1.46-04	1.23-04	1.04-04	8.80-05	7.37-05	5.84-05						
23	2.41-04	2.00-04	1.67-04	1.40-04	1.18-04	9.78-05	7.71-05							
22	2.78-04	2.29-04	1.91-04	1.59-04	1.31-04	1.03-04								
21	3.20-04	2.64-04	2.18-04	1.78-04	1.38-04									
20	3.68-04	3.01-04	2.44-04	1.88-04										
19	4.20-04	3.37-04	2.58-04											
18	4.68-04	3.54-04												
17	4.85-04													

HE + TE = 3.00+03 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.75-31	-5.63-37	-3.13-36	-9.94-36	-2.48-35	-5.33-35	-1.02-34	-1.79-34	-2.88-34	-4.22-34	-5.43-34	-5.68-34	-3.76-34	1.36-34
45	9.27-31	-8.00-37	-4.42-36	-1.41-35	-3.54-35	-7.63-35	-1.48-34	-2.61-34	-4.24-34	-6.28-34	-8.24-34	-8.89-34	-6.43-34	7.60-35
40	1.32-30	-1.19-36	-6.57-36	-2.10-35	-5.31-35	-1.16-34	-2.25-34	-4.03-34	-6.64-34	-1.00-33	-1.35-33	-1.52-33	-1.22-33	-1.71-34
35	1.98-30	-1.90-36	-1.04-35	-3.35-35	-8.54-35	-1.88-34	-3.72-34	-6.77-34	-1.14-33	-1.77-33	-2.46-33	-2.93-33	-2.66-33	-1.10-33
30	3.16-30	-3.32-36	-1.80-35	-5.85-35	-1.51-34	-3.40-34	-6.87-34	-1.28-33	-2.23-33	-3.60-33	-5.29-33	-6.80-33	-7.15-33	-5.04-33
29	3.50-30	-3.76-36	-2.03-35	-6.63-35	-1.72-34	-3.88-34	-7.91-34	-1.49-33	-2.61-33	-4.25-33	-6.33-33	-8.31-33	-9.03-33	-6.93-33
28	3.89-30	-4.28-36	-2.31-35	-7.56-35	-1.97-34	-4.47-34	-9.16-34	-1.74-33	-3.07-33	-5.07-33	-7.67-33	-1.03-32	-1.16-32	-9.64-33
27	4.35-30	-4.89-36	-2.64-35	-8.67-35	-2.27-34	-5.18-34	-1.07-33	-2.05-33	-3.66-33	-6.12-33	-9.42-33	-1.29-32	-1.51-32	-1.36-32
26	4.88-30	-5.63-36	-3.04-35	-1.00-34	-2.64-34	-6.05-34	-1.26-33	-2.43-33	-4.41-33	-7.48-33	-1.17-32	-1.65-32	-2.01-32	-1.95-32
25	5.50-30	-6.51-36	-3.51-35	-1.16-34	-3.08-34	-7.12-34	-1.50-33	-2.92-33	-5.37-33	-9.26-33	-1.48-32	-2.15-32	-2.73-32	-2.86-32
24	6.23-30	-7.58-36	-4.08-35	-1.36-34	-3.62-34	-8.45-34	-1.79-33	-3.55-33	-6.62-33	-1.16-32	-1.91-32	-2.87-32	-3.81-32	-4.32-32
23	7.09-30	-8.86-36	-4.77-35	-1.60-34	-4.30-34	-1.01-33	-2.17-33	-4.37-33	-8.29-33	-1.49-32	-2.52-32	-3.92-32	-5.48-32	-6.74-32
22	8.13-30	-1.04-35	-5.62-35	-1.89-34	-5.13-34	-1.22-33	-2.66-33	-5.44-33	-1.05-32	-1.94-32	-3.39-32	-5.51-32	-8.18-32	-1.10-31
21	9.37-30	-1.23-35	-6.64-35	-2.25-34	-6.17-34	-1.49-33	-3.30-33	-6.86-33	-1.36-32	-2.59-32	-4.70-32	-8.03-32	-1.28-31	-1.89-31
20	1.09-29	-1.44-35	-7.82-35	-2.68-34	-7.43-34	-1.82-33	-4.11-33	-8.75-33	-1.79-32	-3.53-32	-6.70-32	-1.22-31	-2.10-31	-3.49-31
19	1.28-29	-1.69-35	-9.26-35	-3.20-34	-9.01-34	-2.24-33	-5.18-33	-1.13-32	-2.40-32	-4.95-32	-9.95-32	-1.95-31	-3.73-31	-7.22-31
18	1.51-29	-1.96-35	-1.09-34	-3.81-34	-1.09-33	-2.77-33	-6.56-33	-1.49-32	-3.28-32	-7.15-32	-1.55-31	-3.34-31	-7.37-31	-1.77-30
17	1.80-29	-2.22-35	-1.26-34	-4.49-34	-1.31-33	-3.41-33	-8.33-33	-1.97-32	-4.58-32	-1.07-31	-2.55-31	-6.32-31	-1.72-30	-5.96-30
16	2.17-29	-2.44-35	-1.43-34	-5.17-34	-1.54-33	-4.14-33	-1.05-32	-2.61-32	-6.51-32	-1.67-31	-4.56-31	-1.39-30	-5.41-30	-4.31-29
15	2.66-29	-2.51-35	-1.55-34	-5.75-34	-1.76-33	-4.91-33	-1.31-32	-3.47-32	-9.49-32	-2.78-31	-9.30-31	-4.05-30	-3.61-29	
14	3.30-29	-2.38-35	-1.60-34	-6.13-34	-1.94-33	-5.66-33	-1.60-32	-4.64-32	-1.44-31	-5.17-31	-2.47-30	-2.46-29		
13	4.18-29	-2.02-35	-1.57-34	-6.27-34	-2.07-33	-6.39-33	-1.97-32	-6.43-32	-2.43-31	-1.23-30	-1.34-29			
12	5.40-29	-1.46-35	-1.51-34	-6.35-34	-2.21-33	-7.34-33	-2.54-32	-9.99-32	-5.31-31	-6.09-30				
11	7.16-29	-7.56-36	-1.45-34	-6.60-34	-2.47-33	-9.12-33	-3.77-32	-2.07-31	-2.46-30					
10	9.79-29	1.85-36	-1.44-34	-7.27-34	-3.02-33	-1.32-32	-7.57-32	-9.22-31						
9	1.39-28	1.65-35	-1.45-34	-8.64-34	-4.23-33	-2.54-32	-3.19-31							
8	2.09-28	4.36-35	-1.38-34	-1.11-33	-7.33-33	-9.42-32								
7	3.38-28	1.02-34	-8.25-35	-1.45-33	-1.92-32									
6	6.07-28	2.54-34	2.57-34	3.91-34										
5	1.30-27	7.72-34	3.62-33											
4	3.88-27	4.17-33												
3	2.82-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.01-33	2.24-33	3.83-33	5.78-33	8.13-33	1.10-32	1.43-32	1.83-32	2.31-32	2.89-32	3.60-32	4.46-32	5.52-32	6.83-32
45	1.35-33	3.20-33	5.65-33	8.73-33	1.25-32	1.73-32	2.31-32	3.02-32	3.91-32	5.02-32	6.43-32	8.23-32	1.06-31	1.36-31
40	1.80-33	4.78-33	8.88-33	1.43-32	2.12-32	3.03-32	4.18-32	5.67-32	7.65-32	1.03-31	1.39-31	1.88-31	2.57-31	3.58-31
35	2.18-33	7.50-33	1.53-32	2.62-32	4.12-32	6.25-32	9.18-32	1.34-31	1.95-31	2.86-31	4.29-31	6.61-31	1.06-30	1.79-30
30	7.94-34	1.17-32	2.98-32	5.85-32	1.04-31	1.78-31	3.00-31	5.13-31	9.14-31	1.74-30	3.67-30	9.25-30	3.24-29	2.51-28
29	-3.96-34	1.25-32	3.47-32	7.12-32	1.31-31	2.35-31	4.16-31	7.59-31	1.47-30	3.14-30	8.01-30	2.83-29	2.21-28	
28	-2.36-33	1.29-32	4.05-32	8.81-32	1.71-31	3.23-31	6.09-31	1.21-30	2.64-30	6.81-30	2.43-29	1.91-28		
27	-5.64-33	1.25-32	4.74-32	1.11-31	2.30-31	4.65-31	9.59-31	2.15-30	5.67-30	2.05-29	1.63-28			
26	-1.11-32	1.04-32	5.52-32	1.44-31	3.22-31	7.19-31	1.68-30	4.56-30	1.69-29	1.36-28				
25	-2.06-32	4.67-33	6.30-32	1.91-31	4.81-31	1.23-30	3.49-30	1.33-29	1.11-28					
24	-3.74-32	-9.17-33	6.77-32	2.61-31	7.81-31	2.47-30	9.94-30	8.55-29						
23	-6.86-32	-4.16-32	5.81-32	3.71-31	1.46-30	6.70-30	6.13-29							
22	-1.30-31	-1.21-31	-6.07-33	5.36-31	3.53-30	3.86-29								
21	-2.62-31	-3.33-31	-3.05-31	6.24-31	1.67-29									
20	-5.77-31	-9.97-31	-1.90-30	-3.26-30										
19	-1.52-30	-4.03-30	-2.09-29											
18	-5.46-30	-3.46-29												
17	-4.25-29													

HE + TE = 3.00+03 NE = 1.00+11 CASE B NC = 20

TOTAL RC = 1.459-11 4-3 RC = 2.229-12 4-3 EM = 9.448-24 2S RC = 4.072-12 2P RC = 1.051-11

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.58-03	1.71-03	7.36-04	3.81-04	2.22-04	1.41-04	9.48-05	6.68-05	4.88-05	3.68-05	2.84-05	2.24-05	1.79-05	1.46-05
45	7.81-03	2.39-03	1.03-03	5.33-04	3.11-04	1.97-04	1.33-04	9.34-05	6.83-05	5.14-05	3.97-05	3.12-05	2.50-05	2.04-05
40	1.14-02	3.50-03	1.51-03	7.80-04	4.55-04	2.88-04	1.94-04	1.37-04	9.98-05	7.51-05	5.80-05	4.56-05	3.66-05	2.98-05
35	1.77-02	5.44-03	2.34-03	1.21-03	7.06-04	4.47-04	3.01-04	2.12-04	1.55-04	1.16-04	8.99-05	7.07-05	5.67-05	4.61-05
30	2.99-02	9.17-03	3.94-03	2.04-03	1.19-03	7.53-04	5.06-04	3.57-04	2.60-04	1.96-04	1.51-04	1.19-04	9.52-05	7.74-05
29	3.36-02	1.03-02	4.43-03	2.29-03	1.34-03	8.46-04	5.69-04	4.01-04	2.93-04	2.20-04	1.70-04	1.34-04	1.07-04	8.69-05
28	3.80-02	1.17-02	5.01-03	2.59-03	1.51-03	9.56-04	6.43-04	4.53-04	3.31-04	2.49-04	1.92-04	1.51-04	1.21-04	9.81-05
27	4.32-02	1.32-02	5.69-03	2.95-03	1.72-03	1.09-03	7.30-04	5.14-04	3.76-04	2.82-04	2.18-04	1.71-04	1.37-04	1.11-04
26	4.94-02	1.51-02	6.51-03	3.37-03	1.96-03	1.24-03	8.35-04	5.88-04	4.29-04	3.23-04	2.49-04	1.95-04	1.56-04	1.27-04
25	5.69-02	1.74-02	7.49-03	3.88-03	2.26-03	1.43-03	9.61-04	6.76-04	4.94-04	3.71-04	2.86-04	2.25-04	1.80-04	1.46-04
24	6.60-02	2.02-02	8.68-03	4.49-03	2.62-03	1.66-03	1.11-03	7.84-04	5.72-04	4.30-04	3.31-04	2.60-04	2.08-04	1.69-04
23	7.71-02	2.36-02	1.01-02	5.25-03	3.06-03	1.94-03	1.30-03	9.15-04	6.68-04	5.02-04	3.86-04	3.03-04	2.42-04	1.96-04
22	9.09-02	2.79-02	1.20-02	6.19-03	3.61-03	2.28-03	1.53-03	1.08-03	7.86-04	5.91-04	4.54-04	3.57-04	2.85-04	2.30-04
21	1.08-01	3.32-02	1.42-02	7.37-03	4.29-03	2.71-03	1.82-03	1.28-03	9.34-04	7.02-04	5.39-04	4.23-04	3.37-04	2.73-04
20	1.30-01	3.98-02	1.71-02	8.84-03	5.15-03	3.26-03	2.19-03	1.54-03	1.12-03	8.41-04	6.46-04	5.06-04	4.03-04	3.25-04
19	1.58-01	4.84-02	2.08-02	1.07-02	6.26-03	3.96-03	2.66-03	1.87-03	1.36-03	1.02-03	7.82-04	6.12-04	4.86-04	3.90-04
18	1.94-01	5.95-02	2.55-02	1.32-02	7.69-03	4.86-03	3.26-03	2.29-03	1.67-03	1.25-03	9.56-04	7.46-04	5.90-04	4.71-04
17	2.42-01	7.40-02	3.17-0	1.64-02	9.55-03	6.03-03	4.04-03	2.84-03	2.06-03	1.54-03	1.18-03	9.17-04	7.20-04	5.64-04
16	3.03-01	9.28-02	3.98-02	2.06-02	1.20-02	7.55-03	5.06-03	3.54-03	2.57-03	1.92-03	1.46-03	1.13-03	8.70-04	6.42-04
15	3.82-01	1.17-01	5.01-02	2.59-02	1.50-02	9.48-03	6.35-03	4.44-03	3.22-03	2.39-03	1.81-03	1.37-03	9.96-04	
14	4.79-01	1.46-01	6.28-02	3.24-02	1.88-02	1.19-02	7.93-03	5.53-03	3.99-03	2.95-03	2.19-03	1.56-03		
13	5.88-01	1.80-01	7.71-02	3.98-02	2.31-02	1.45-02	9.68-03	6.73-03	4.82-03	3.50-03	2.45-03			
12	6.90-01	2.11-01	9.04-02	4.66-02	2.70-02	1.70-02	1.13-02	7.78-03	5.48-03	3.74-03				
11	7.53-01	2.30-01	9.85-02	5.07-02	2.93-02	1.84-02	1.21-02	8.22-03	5.45-03					
10	7.65-01	2.34-01	9.99-02	5.13-02	2.96-02	1.84-02	1.19-02	7.64-03						
9	7.66-01	2.34-01	9.99-02	5.12-02	2.93-02	1.79-02	1.10-02							
8	8.18-01	2.50-01	1.06-01	5.43-02	3.07-02	1.77-02								
7	9.63-01	2.94-01	1.25-01	6.32-02	3.38-02									
6	1.26+00	3.86-01	1.64-01	7.88-02										
5	1.87+00	5.74-01	2.36-01											
4	3.37+00	1.00+00												
3	8.61+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.20-05	1.00-05	8.46-06	7.19-06	6.17-06	5.33-06	4.64-06	4.06-06	3.57-06	3.16-06	2.81-06	2.51-06	2.25-06	2.02-06
45	1.68-05	1.40-05	1.18-05	1.00-05	8.61-06	7.44-06	6.47-06	5.66-06	4.98-06	4.41-06	3.91-06	3.49-06	3.13-06	2.81-06
40	2.45-05	2.05-05	1.72-05	1.47-05	1.26-05	1.09-05	9.43-06	8.25-06	7.25-06	6.41-06	5.69-06	5.07-06	4.54-06	4.08-06
35	3.80-05	3.17-05	2.67-05	2.27-05	1.94-05	1.68-05	1.45-05	1.27-05	1.12-05	9.85-06	8.73-06	7.76-06	6.92-06	6.19-06
30	6.37-05	5.31-05	4.46-05	3.79-05	3.24-05	2.79-05	2.42-05	2.11-05	1.84-05	1.61-05	1.42-05	1.24-05	1.07-05	8.72-06
29	7.15-05	5.96-05	5.01-05	4.25-05	3.63-05	3.13-05	2.71-05	2.35-05	2.05-05	1.79-05	1.56-05	1.34-05	1.09-05	
28	8.07-05	6.72-05	5.65-05	4.79-05	4.09-05	3.51-05	3.04-05	2.63-05	2.29-05	1.98-05	1.70-05	1.37-05		
27	9.15-05	7.62-05	6.40-05	5.42-05	4.62-05	3.97-05	3.42-05	2.96-05	2.55-05	2.17-05	1.75-05			
26	1.04-04	8.68-05	7.29-05	6.17-05	5.25-05	4.50-05	3.86-05	3.31-05	2.81-05	2.25-05				
25	1.20-04	9.96-05	8.35-05	7.05-05	5.99-05	5.11-05	4.36-05	3.67-05	2.93-05					
24	1.38-04	1.15-04	9.62-05	8.11-05	6.86-05	5.81-05	4.87-05	3.86-05						
23	1.61-04	1.33-04	1.11-04	9.36-05	7.86-05	6.54-05	5.15-05							
22	1.89-04	1.56-04	1.30-04	1.08-04	8.93-05	6.99-05								
21	2.23-04	1.83-04	1.51-04	1.24-04	9.63-05									
20	2.64-04	2.16-04	1.75-04	1.35-04										
19	3.15-04	2.53-04	1.93-04											
18	3.74-04	2.82-04												
17	4.21-04													

HE + TE = 3.00+03 NE = 1.00+11 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.18-30	-4.01-37	-2.60-36	-8.01-36	-1.88-35	-3.61-35	-5.47-35	-4.82-35	5.43-35	3.58-34	9.19-34	1.71-33	2.68-33	3.81-33
45	1.63-30	-5.77-37	-3.70-36	-1.14-35	-2.71-35	-5.25-35	-8.08-35	-7.56-35	6.42-35	4.93-34	1.30-33	2.45-33	3.89-33	5.59-33
40	2.32-30	-8.78-37	-5.54-36	-1.72-35	-4.11-35	-8.08-35	-1.27-34	-1.28-34	6.83-35	7.02-34	1.92-33	3.71-33	6.00-33	8.79-33
35	3.47-30	-1.44-36	-8.88-36	-2.76-35	-6.73-35	-1.35-34	-2.20-34	-2.42-34	4.18-35	1.04-33	3.04-33	6.08-33	1.01-32	1.52-32
30	5.54-30	-2.60-36	-1.57-35	-4.97-35	-1.23-34	-2.53-34	-4.32-34	-5.32-34	-1.23-34	1.58-33	5.25-33	1.11-32	1.95-32	3.08-32
29	6.14-30	-2.98-36	-1.78-35	-5.68-35	-1.41-34	-2.92-34	-5.05-34	-6.38-34	-2.02-34	1.71-33	5.93-33	1.28-32	2.27-32	3.65-32
28	6.83-30	-3.43-36	-2.04-35	-6.52-35	-1.63-34	-3.41-34	-5.95-34	-7.73-34	-3.13-34	1.85-33	6.73-33	1.49-32	2.68-32	4.37-32
27	7.63-30	-3.98-36	-2.36-35	-7.55-35	-1.89-34	-4.00-34	-7.09-34	-9.47-34	-4.68-34	1.99-33	7.69-33	1.74-32	3.20-32	5.31-32
26	8.56-30	-4.66-36	-2.74-35	-8.80-35	-2.23-34	-4.75-34	-8.53-34	-1.17-33	-6.88-34	2.11-33	8.82-33	2.06-32	3.86-32	6.57-32
25	9.65-30	-5.49-36	-3.20-35	-1.04-34	-2.64-34	-5.69-34	-1.04-33	-1.47-33	-1.00-33	2.20-33	1.02-32	2.46-32	4.74-32	8.29-32
24	1.09-29	-6.53-36	-3.78-35	-1.23-34	-3.16-34	-6.90-34	-1.28-33	-1.88-33	-1.46-33	2.21-33	1.18-32	2.97-32	5.93-32	1.07-31
23	1.24-29	-7.84-36	-4.51-35	-1.48-34	-3.83-34	-8.47-34	-1.61-33	-2.44-33	-2.15-33	2.06-33	1.37-32	3.65-32	7.58-32	1.43-31
22	1.43-29	-9.52-36	-5.45-35	-1.79-34	-4.71-34	-1.06-33	-2.05-33	-3.22-33	-3.18-33	1.61-33	1.60-32	4.56-32	9.96-32	1.97-31
21	1.64-29	-1.17-35	-6.65-35	-2.21-34	-5.87-34	-1.34-33	-2.65-33	-4.35-33	-4.77-33	5.83-34	1.86-32	5.81-32	1.35-31	2.87-31
20	1.91-29	-1.45-35	-8.20-35	-2.75-34	-7.41-34	-1.72-33	-3.51-33	-6.01-33	-7.28-33	-1.48-33	2.13-32	7.60-32	1.93-31	4.50-31
19	2.24-29	-1.82-35	-1.03-34	-3.49-34	-9.55-34	-2.27-33	-4.77-33	-8.55-33	-1.15-32	-5.82-33	2.32-32	1.01-31	2.91-31	7.76-31
18	2.64-29	-2.33-35	-1.31-34	-4.49-34	-1.25-33	-3.06-33	-6.65-33	-1.26-32	-1.87-32	-1.48-32	2.17-32	1.39-31	4.77-31	1.57-30
17	3.16-29	-3.00-35	-1.69-34	-5.89-34	-1.68-33	-4.22-33	-9.56-33	-1.92-32	-3.17-32	-3.43-32	8.94-33	1.95-31	8.94-31	4.29-30
16	3.81-29	-3.91-35	-2.20-34	-7.84-34	-2.30-33	-5.98-33	-1.42-32	-3.07-32	5.68-32	-7.92-32	-4.31-32	2.64-31	2.14-30	2.46-29
15	4.67-29	-5.12-35	-2.90-34	-1.06-33	-3.20-33	-8.70-33	-2.20-32	-5.17-32	-1.09-31	-1.95-31	-2.53-31	1.82-31	9.45-30	
14	5.80-29	-6.64-35	-3.83-34	-1.43-33	-4.52-33	-1.30-32	-3.53-32	-9.26-32	-2.31-31	-5.50-31	-1.34-30	-3.87-30		
13	7.33-29	-8.36-35	-4.96-34	-1.93-33	-6.38-33	-1.96-32	-5.91-32	-1.80-31	-5.66-31	-2.05-30	-1.31-29			
12	9.48-29	-9.85-35	-6.13-34	-2.50-33	-8.83-33	-2.98-32	-1.03-31	-3.89-31	-1.80-30	-1.56-29				
11	1.26-28	-1.03-34	-7.00-34	-3.03-33	-1.17-32	-4.51-32	-1.92-31	-1.05-30	-1.13-29					
10	1.72-28	-9.05-35	-7.27-34	-3.43-33	-1.50-32	-7.01-32	-4.26-31	-5.37-30						
9	2.45-28	-6.35-35	-7.22-34	-3.87-33	-2.03-32	-1.34-31	-1.84-30							
8	3.67-28	-2.45-35	-7.50-34	-4.91-33	-3.57-32	-5.24-31								
7	5.93-28	4.18-35	-8.73-34	-8.24-33	-1.32-31									
6	1.06-27	2.03-34	-1.18-33	-2.67-32										
5	2.28-27	7.88-34	-1.67-33											
4	6.81-27	4.97-33												
3	4.94-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.10-33	6.60-33	8.35-33	1.04-32	1.28-32	1.57-32	1.91-32	2.32-32	2.82-32	3.42-32	4.15-32	5.04-32	6.13-32	7.49-32
45	7.60-33	9.96-33	1.28-32	1.61-32	2.02-32	2.52-32	3.13-32	3.89-32	4.83-32	6.00-32	7.49-32	9.40-32	1.19-31	1.51-31
40	1.22-32	1.63-32	2.13-32	2.75-32	3.53-32	4.54-32	5.81-32	7.47-32	9.64-32	1.25-31	1.64-31	2.18-31	2.93-31	4.02-31
35	2.17-32	2.99-32	4.06-32	5.45-32	7.31-32	9.85-32	1.33-31	1.83-31	2.54-31	3.61-31	5.25-31	7.89-31	1.24-30	2.06-30
30	4.62-32	6.75-32	9.76-32	1.41-31	2.07-31	3.09-31	4.74-31	7.57-31	1.28-30	2.33-30	4.76-30	1.17-29	4.00-29	3.04-28
29	5.56-32	8.26-32	1.22-31	1.81-31	2.72-31	4.21-31	6.76-31	1.15-30	2.10-30	4.30-30	1.06-29	3.63-29	2.77-28	
28	6.78-32	1.03-31	1.55-31	2.37-31	3.70-31	6.00-31	1.02-30	1.88-30	3.87-30	9.54-30	3.28-29	2.51-28		
27	8.41-32	1.31-31	2.03-31	3.22-31	5.25-31	9.05-31	1.67-30	3.46-30	8.57-30	2.96-29	2.27-28			
26	1.07-31	1.71-31	2.75-31	4.56-31	7.91-31	1.48-30	3.07-30	7.64-30	2.65-29	2.04-28				
25	1.39-31	2.30-31	3.89-31	6.84-31	1.29-30	2.70-30	6.77-30	2.36-29	1.82-28					
24	1.86-31	3.24-31	5.82-31	1.11-30	2.35-30	5.94-30	2.08-29	1.61-28						
23	2.61-31	4.82-31	9.40-31	2.02-30	5.15-30	1.82-29	1.42-28							
22	3.84-31	7.73-31	1.70-30	4.39-30	1.57-29	1.23-28								
21	6.10-31	1.38-30	3.67-30	1.33-29	1.06-28									
20	1.08-30	2.97-30	1.10-29	8.93-29										
19	2.26-30	8.74-30	7.26-29											
18	6.50-30	5.64-29												
17	4.03-29													

HE + TE = 3.00+03 NE = 1.00+12 CASE B NC = 20

TOTAL RC = 3.487-11 4-3 RC = 5.311-12 4-3 EM = 2.251-23 2S RC = 8.155-12 2P RC = 2.671-11

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.34-03	7.19-04	3.09-04	1.60-04	9.33-05	5.91-05	3.98-05	2.80-05	2.05-05	1.54-05	1.19-05	9.38-06	7.52-06	6.12-06
45	3.28-03	1.01-03	4.32-04	2.24-04	1.31-04	8.27-05	5.56-05	3.92-05	2.87-05	2.16-05	1.67-05	1.31-05	1.05-05	8.55-06
40	4.80-03	1.47-03	6.32-04	3.27-04	1.91-04	1.21-04	8.14-05	5.73-05	4.19-05	3.15-05	2.43-05	1.92-05	1.54-05	1.25-05
35	7.45-03	2.29-03	9.82-04	5.09-04	2.97-04	1.88-04	1.26-04	8.90-05	6.50-05	4.89-05	3.77-05	2.97-05	2.38-05	1.94-05
30	1.26-02	3.86-03	1.66-03	8.58-04	5.00-04	3.17-04	2.13-04	1.50-04	1.10-04	8.24-05	6.36-05	5.00-05	4.00-05	3.26-05
29	1.42-02	4.34-03	1.86-03	9.65-04	5.63-04	3.56-04	2.40-04	1.69-04	1.23-04	9.27-05	7.14-05	5.62-05	4.50-05	3.66-05
28	1.60-02	4.91-03	2.11-03	1.09-03	6.36-04	4.03-04	2.71-04	1.91-04	1.39-04	1.05-04	8.07-05	6.35-05	5.08-05	4.13-05
27	1.82-02	5.58-03	2.40-03	1.24-03	7.24-04	4.58-04	3.08-04	2.17-04	1.58-04	1.19-04	9.18-05	7.22-05	5.78-05	4.69-05
26	2.09-02	6.39-03	2.75-03	1.42-03	8.28-04	5.24-04	3.52-04	2.48-04	1.81-04	1.36-04	1.05-04	8.25-05	6.60-05	5.36-05
25	2.40-02	7.37-03	3.17-03	1.64-03	9.55-04	6.04-04	4.06-04	2.86-04	2.09-04	1.57-04	1.21-04	9.50-05	7.60-05	6.16-05
24	2.79-02	8.57-03	3.68-03	1.90-03	1.11-03	7.02-04	4.72-04	3.32-04	2.42-04	1.82-04	1.40-04	1.10-04	8.81-05	7.14-05
23	3.28-02	1.00-02	4.31-03	2.23-03	1.30-03	8.22-04	5.52-04	3.89-04	2.84-04	2.13-04	1.64-04	1.29-04	1.03-04	8.3[illegible]-05
22	3.88-02	1.19-02	5.10-03	2.64-03	1.54-03	9.73-04	6.53-04	4.60-04	3.35-04	2.52-04	1.94-04	1.52-04	1.21-04	9.83-05
21	4.64-02	1.42-02	6.11-03	3.16-03	1.84-03	1.16-03	7.81-04	5.49-04	4.01-04	3.01-04	2.31-04	1.81-04	1.45-04	1.17-04
20	5.62-02	1.72-02	7.39-03	3.82-03	2.23-03	1.41-03	9.45-04	6.64-04	4.84-04	3.63-04	2.79-04	2.19-04	1.74-04	1.40-04
19	6.90-02	2.12-02	9.08-03	4.69-03	2.73-03	1.73-03	1.16-03	8.14-04	5.93-04	4.45-04	3.41-04	2.67-04	2.12-04	1.70-04
18	8.62-02	2.64-02	1.13-02	5.86-03	3.41-03	2.15-03	1.44-03	1.01-03	7.38-04	5.53-04	4.24-04	3.31-04	2.62-04	2.09-04
17	1.10-01	3.36-02	1.44-02	7.44-03	4.33-03	2.73-03	1.83-03	1.29-03	9.35-04	6.99-04	5.35-04	4.16-04	3.26-04	2.56-04
16	1.42-01	4.36-02	1.87-02	9.65-03	5.61-03	3.54-03	2.37-03	1.66-03	1.21-03	9.01-04	6.86-04	5.30-04	4.09-04	3.02-04
15	1.89-01	5.78-02	2.48-02	1.28-02	7.44-03	4.69-03	3.14-03	2.20-03	1.59-03	1.18-03	8.95-04	6.79-04	4.93-04	
14	2.57-01	7.87-02	3.37-02	1.74-02	1.01-02	6.37-03	4.26-03	2.97-03	2.15-03	1.58-03	1.18-03	8.40-04		
13	3.59-01	1.10-01	4.71-02	2.43-02	1.41-02	8.86-03	5.91-03	4.11-03	2.95-03	2.14-03	1.49-03			
12	5.13-01	1.57-01	6.72-02	3.46-02	2.01-02	1.26-02	8.36-03	5.77-03	4.06-03	2.77-03				
11	7.39-01	2.26-01	9.65-02	4.96-02	2.87-02	1.79-02	1.18-02	8.01-03	5.31-03					
10	1.03+00	3.15-01	1.35-01	6.91-02	3.98-02	2.47-02	1.60-02	1.02-02						
9	1.32+00	4.02-01	1.71-01	8.75-02	5.00-02	3.05-02	1.86-02							
8	1.44+00	4.39-01	1.86-01	9.46-02	5.32-02	3.06-02								
7	1.45+00	4.40-01	1.85-01	9.27-02	4.91-02									
6	1.59+00	4.80-01	1.99-01	9.41-02										
5	2.11+00	6.28-01	2.47-01											
4	3.55+00	1.00+00												
3	8.62+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.05-06	4.21-06	3.55-06	3.02-06	2.59-06	2.24-06	1.95-06	1.70-06	1.50-06	1.33-06	1.18-06	1.05-06	9.43-07	8.49-07
45	7.05-06	5.88-06	4.96-06	4.22-06	3.62-06	3.12-06	2.72-06	2.38-06	2.09-06	1.85-06	1.64-06	1.47-06	1.31-06	1.18-06
40	1.03-05	8.59-06	7.24-06	6.16-06	5.28-06	4.56-06	3.96-06	3.46-06	3.05-06	2.69-06	2.39-06	2.13-06	1.91-06	1.71-06
35	1.60-05	1.33-05	1.12-05	9.52-06	8.16-06	7.04-06	6.11-06	5.34-06	4.69-06	4.14-06	3.67-06	3.26-06	2.91-06	2.60-06
30	2.68-05	2.23-05	1.88-05	1.59-05	1.36-05	1.17-05	1.02-05	8.86-06	7.75-06	6.79-06	5.96-06	5.21-06	4.50-06	3.67-06
29	3.01-05	2.51-05	2.11-05	1.79-05	1.53-05	1.32-05	1.14-05	9.90-06	8.64-06	7.54-06	6.57-06	5.65-06	4.59-06	
28	3.40-05	2.83-05	2.38-05	2.02-05	1.72-05	1.48-05	1.28-05	1.11-05	9.64-06	8.36-06	7.15-06	5.79-06		
27	3.86-05	3.21-05	2.70-05	2.28-05	1.95-05	1.67-05	1.44-05	1.25-05	1.07-05	9.15-06	7.37-06			
26	4.41-05	3.66-05	3.08-05	2.60-05	2.22-05	1.90-05	1.63-05	1.40-05	1.18-05	9.49-06				
25	5.07-05	4.21-05	3.53-05	2.98-05	2.53-05	2.16-05	1.84-05	1.55-05	1.24-05					
24	5.86-05	4.87-05	4.07-05	3.43-05	2.91-05	2.46-05	2.06-05	1.63-05						
23	6.84-05	5.67-05	4.73-05	3.98-05	3.34-05	2.78-05	2.19-05							
22	8.05-05	6.65-05	5.53-05	4.61-05	3.81-05	2.98-05								
21	9.55-05	7.86-05	6.49-05	5.32-05	4.13-05									
20	1.14-04	9.34-05	7.58-05	5.84-05										
19	1.38-04	1.11-04	8.45-05											
18	1.66-04	1.25-04												
17	1.91-04													

HE + TE = 3.00+03 NE = 1.00+12 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.83-30	5.86-38	-6.46-37	-6.74-37	6.92-36	5.31-35	2.26-34	6.23-34	1.20-33	1.87-33	2.59-33	3.38-33	4.26-33	5.28-33
45	3.89-30	5.51-38	-1.00-36	-1.28-36	8.73-36	7.23-35	3.14-34	8.74-34	1.70-33	2.67-33	3.73-33	4.90-33	6.24-33	7.82-33
40	5.55-30	2.65-38	-1.67-36	-2.57-36	1.08-35	1.01-34	4.54-34	1.28-33	2.53-33	4.02-33	5.67-33	7.56-33	9.76-33	1.24-32
35	8.31-30	-7.86-38	-3.04-36	-5.55-36	1.23-35	1.48-34	6.93-34	2.01-33	4.03-33	6.50-33	9.36-33	1.27-32	1.68-32	2.18-32
30	1.32-29	-4.33-37	-6.26-36	-1.34-35	8.98-36	2.22-34	1.13-33	3.42-33	7.07-33	1.17-32	1.74-32	2.44-32	3.35-32	4.54-32
29	1.47-29	-5.74-37	-7.38-36	-1.63-35	6.55-36	2.42-34	1.27-33	3.86-33	8.04-33	1.35-32	2.01-32	2.85-32	3.94-32	5.42-32
28	1.63-29	-7.56-37	-8.76-36	-1.99-35	2.92-36	2.63-34	1.42-33	4.37-33	9.21-33	1.55-32	2.35-32	3.36-32	4.70-32	6.55-32
27	1.82-29	-9.94-37	-1.05-35	-2.46-35	-2.40-36	2.86-34	1.59-33	4.99-33	1.06-32	1.81-32	2.76-32	4.00-32	5.68-32	8.05-32
26	2.05-29	-1.31-36	-1.27-35	-3.06-35	-1.01-35	3.10-34	1.80-33	5.73-33	1.23-32	2.13-32	3.29-32	4.83-32	6.98-32	1.01-31
25	2.31-29	-1.72-36	-1.55-35	-3.84-35	-2.12-35	3.35-34	2.05-33	6.63-33	1.45-32	2.53-32	3.97-32	5.93-32	8.73-32	1.29-31
24	2.61-29	-2.28-36	-1.91-35	-4.88-35	-3.74-35	3.58-34	2.34-33	7.74-33	1.72-32	3.05-32	4.86-32	7.41-32	1.12-31	1.70-31
23	2.98-29	-3.03-36	-2.38-35	-6.26-35	-6.08-35	3.79-34	2.68-33	9.12-33	2.06-32	3.73-32	6.07-32	9.47-32	1.47-31	2.31-31
22	3.41-29	-4.05-36	-3.01-35	-8.15-35	-9.52-35	3.91-34	3.09-33	1.09-32	2.51-32	4.64-32	7.74-32	1.24-31	2.00-31	3.29-31
21	3.93-29	-5.47-36	-3.86-35	-1.08-34	-1.46-34	3.87-34	3.58-33	1.31-32	3.11-32	5.90-32	1.01-31	1.69-31	2.84-31	4.96-31
20	4.57-29	-7.44-36	-5.02-35	-1.44-34	-2.22-34	3.55-34	4.17-33	1.60-32	3.93-32	7.69-32	1.37-31	2.39-31	4.27-31	8.09-31
19	5.35-29	-1.03-35	-6.67-35	-1.97-34	-3.39-34	2.63-34	4.85-33	1.99-32	5.07-32	1.04-31	1.94-31	3.58-31	6.94-31	1.48-30
18	6.32-29	-1.44-35	-9.03-35	-2.75-34	-5.23-34	6.08-35	5.63-33	2.51-32	6.75-32	1.45-31	2.88-31	5.80-31	1.27-30	3.25-30
17	7.55-29	-2.06-35	-1.25-34	-3.94-34	-8.19-34	-3.50-34	6.44-33	3.23-32	9.29-32	2.14-31	4.63-31	1.05-30	2.76-30	9.92-30
16	9.12-29	-3.00-35	-1.78-34	-5.80-34	-1.31-33	-1.17-33	7.08-33	4.26-32	1.34-31	3.38-31	8.29-31	2.27-30	8.36-30	6.71-29
15	1.12-28	-4.47-35	-2.61-34	-8.80-34	-2.16-33	-2.84-33	6.94-33	5.74-32	2.05-31	5.93-31	1.77-30	6.79-30	5.59-29	
14	1.39-28	-6.80-35	-3.94-34	-1.39-33	-3.69-33	-6.30-33	4.26-33	7.86-32	3.42-31	1.22-30	5.15-30	4.44-29		
13	1.75-28	-1.06-34	-6.14-34	-2.27-33	-6.59-33	-1.39-32	-6.50-33	1.06-31	6.48-31	3.38-30	3.24-29			
12	2.27-28	-1.69-34	-9.90-34	-3.87-33	-1.24-32	-3.10-32	-4.45-32	1.21-31	1.53-30	1.94-29				
11	3.00-28	-2.69-34	-1.63-33	-6.83-33	-2.46-32	-7.74-32	-1.86-31	-8.83-32	6.14-30					
10	4.11-28	-4.12-34	-2.63-33	-1.21-32	-5.08-32	-2.08-31	-8.58-31	-4.30-30						
9	5.85-28	-5.59-34	-3.92-33	-2.07-32	-1.08-31	-6.64-31	-7.03-30							
8	8.78-28	-6.05-34	-5.02-33	-3.27-32	-2.48-31	-3.63-30								
7	1.42-27	-4.99-34	-5.88-33	-5.49-32	-9.62-31									
6	2.54-27	-2.72-34	-8.03-33	-1.74-31										
5	5.44-27	3.98-34	-2.02-32											
4	1.63-26	6.05-33												
3	1.18-25													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.48-33	7.89-33	9.56-33	1.15-32	1.39-32	1.68-32	2.02-32	2.43-32	2.93-32	3.53-32	4.26-32	5.16-32	6.26-32	7.63-32
45	9.69-33	1.19-32	1.47-32	1.80-32	2.20-32	2.70-32	3.32-32	4.08-32	5.02-32	6.21-32	7.72-32	9.64-32	1.21-31	1.54-31
40	1.56-32	1.96-32	2.46-32	3.08-32	3.87-32	4.89-32	6.18-32	7.86-32	1.01-31	1.30-31	1.70-31	2.24-31	3.01-31	4.11-31
35	2.83-32	3.66-32	4.74-32	6.16-32	8.07-32	1.07-31	1.43-31	1.94-31	2.67-31	3.76-31	5.45-31	8.16-31	1.28-30	2.12-30
30	6.16-32	8.41-32	1.16-31	1.62-31	2.32-31	3.40-31	5.14-31	8.12-31	1.36-30	2.46-30	4.99-30	1.22-29	4.16-29	3.15-28
29	7.45-32	1.03-31	1.45-31	2.08-31	3.06-31	4.65-31	7.36-31	1.23-30	2.24-30	4.55-30	1.11-29	3.80-29	2.89-28	
28	9.16-32	1.30-31	1.86-31	2.75-31	4.18-31	6.65-31	1.12-30	2.03-30	4.14-30	1.01-29	3.47-29	2.64-28		
27	1.15-31	1.66-31	2.46-31	3.76-31	5.98-31	1.01-30	1.84-30	3.75-30	9.21-30	3.15-29	2.40-28			
26	1.47-31	2.19-31	3.36-31	5.36-31	9.06-31	1.66-30	3.39-30	8.34-30	2.86-29	2.18-28				
25	1.94-31	2.99-31	4.79-31	8.12-31	1.49-30	3.06-30	7.54-30	2.59-29	1.98-28					
24	2.64-31	4.26-31	7.25-31	1.33-30	2.74-30	6.79-30	2.34-29	1 79-28						
23	3.76-31	6.44-31	1.19-30	2.45-30	6.08-30	2.10-29	1.61-28							
22	5.68-31	1.05-30	2.19-30	5.43-30	1.88-29	1.45-28								
21	9.28-31	1.94-30	4.83-30	1.68-29	1.30-28									
20	1.70-30	4.28-30	1.49-29	1.1[illegible]-28										
19	3.75-30	1.32-29	1.03-28											
18	1.15-29	9.02-29												
17	7.84-29													

HE + TE = 3.00+03 NE = 1.00+13 CASE B NC = 20

TOTAL RC = 1.264-10 4-3 RC = 2.118-11 4-3 EM = 8.978-23 2S RC = 2.670-11 2P RC = 9.972-11

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.87-04	1.80-04	7.74-05	4.01-05	2.34-05	1.48-05	9.97-06	7.03-06	5.14-06	3.87-06	2.99-06	2.35-06	1.89-06	1.53-06
45	8.22-04	2.52-04	1.08-04	5.61-05	3.27-05	2.07-05	1.39-05	9.83-06	7.19-06	5.41-06	4.17-06	3.29-06	2.64-06	2.14-06
40	1.20-03	3.69-04	1.59-04	8.21-05	4.79-05	3.03-05	2.04-05	1.44-05	1.05-05	7.91-06	6.10-06	4.81-06	3.85-06	3.13-06
35	1.87-03	5.73-04	2.46-04	1.28-04	7.44-05	4.71-05	3.17-05	2.23-05	1.63-05	1.23-05	9.47-06	7.45-06	5.97-06	4.86-06
30	3.16-03	9.68-04	4.16-04	2.16-04	1.25-04	7.94-05	5.34-05	3.76-05	2.75-05	2.07-05	1.59-05	1.25-05	1.00-05	8.16-06
29	3.55-03	1.09-03	4.68-04	2.42-04	1.41-04	8.94-05	6.01-05	4.23-05	3.09-05	2.33-05	1.79-05	1.41-05	1.13-05	9.18-06
28	4.02-03	1.23-03	5.29-04	2.74-04	1.60-04	1.01-04	6.79-05	4.78-05	3.49-05	2.63-05	2.03-05	1.59-05	1.28-05	1.04-05
27	4.57-03	1.40-03	6.02-04	3.12-04	1.82-04	1.15-04	7.73-05	5.44-05	3.97-05	2.99-05	2.30-05	1.81-05	1.45-05	1.18-05
26	5.23-03	1.60-03	6.89-04	3.57-04	2.08-04	1.32-04	8.85-05	6.23-05	4.55-05	3.42-05	2.63-05	2.07-05	1.66-05	1.35-05
25	6.04-03	1.85-03	7.95-04	4.11-04	2.40-04	1.52-04	1.02-04	7.18-05	5.24-05	3.94-05	3.03-05	2.39-05	1.91-05	1.55-05
24	7.02-03	2.15-03	9.24-04	4.78-04	2.79-04	1.76-04	1.18-04	8.34-05	6.09-05	4.57-05	3.52-05	2.77-05	2.21-05	1.79-05
23	8.23-03	2.52-03	1.08-03	5.61-04	3.27-04	2.07-04	1.39-04	9.77-05	7.13-05	5.36-05	4.12-05	3.24-05	2.59-05	2.10-05
22	9.76-03	2.99-03	1.28-03	6.64-04	3.87-04	2.45-04	1.64-04	1.16-04	8.44-05	6.34-05	4.88-05	3.83-05	3.05-05	2.47-05
21	1.17-02	3.58-03	1.54-03	7.96-04	4.64-04	2.93-04	1.97-04	1.38-04	1.01-04	7.58-05	5.83-05	4.57-05	3.64-05	2.94-05
20	1.42-02	4.35-03	1.87-03	9.65-04	5.62-04	3.55-04	2.39-04	1.68-04	1.22-04	9.17-05	7.05-05	5.52-05	4.39-05	3.54-05
19	1.75-02	5.36-03	2.30-03	1.19-03	6.92-04	4.37-04	2.94-04	2.06-04	1.50-04	1.13-04	8.64-05	6.76-05	5.37-05	4.31-05
18	2.19-02	6.71-03	2.88-03	1.49-03	8.67-04	5.48-04	3.67-04	2.58-04	1.88-04	1.41-04	1.08-04	8.41-05	6.65-05	5.30-05
17	2.80-02	8.59-03	3.68-03	1.90-03	1.11-03	6.99-04	4.69-04	3.29-04	2.39-04	1.79-04	1.37-04	1.06-04	8.34-05	6.64-05
16	3.67-02	1.12-02	4.82-03	2.49-03	1.45-03	9.14-04	6.12-04	4.29-04	3.11-04	2.32-04	1.77-04	1.36-04	1.05-04	7.77-05
15	4.95-02	1.51-02	6.49-03	3.35-03	1.95-03	1.23-03	8.22-04	5.75-04	4.16-04	3.09-04	2.34-04	1.77-04	1.29-04	
14	6.89-02	2.11-02	9.03-03	4.66-03	2.70-03	1.70-03	1.14-03	7.94-04	5.73-04	4.23-04	3.14-04	2.24-04		
13	9.97-02	3.05-02	1.31-02	6.73-03	3.91-03	2.46-03	1.64-03	1.14-03	8.15-04	5.91-04	4.13-04			
12	1.51-01	4.62-02	1.98-02	1.02-02	5.90-03	3.70-03	2.46-03	1.70-03	1.19-03	8.14-04				
11	2.42-01	7.39-02	3.16-02	1.62-02	9.37-03	5.86-03	3.86-03	2.62-03	1.74-03					
10	4.09-01	1.25-01	5.32-02	2.73-02	1.57-02	9.74-03	6.31-03	4.03-03						
9	7.22-01	2.20-01	9.36-02	4.78-02	2.73-02	1.67-02	1.02-02							
8	1.27+00	3.87-01	1.64-01	8.34-02	4.69-02	2.69-02								
7	1.99+00	6.03-01	2.54-01	1.27-01	6.71-02									
6	2.39+00	7.18-01	2.98-01	1.40-01										
5	2.58+00	7.64-01	2.98-01											
4	3.59+00	1.00+00												
3	8.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.27-06	1.06-06	8.90-07	7.57-07	6.49-07	5.61-07	4.88-07	4.27-07	3.76-07	3.33-07	2.96-07	2.64-07	2.36-07	2.13-07
45	1.77-06	1.48-06	1.24-06	1.06-06	9.07-07	7.83-07	6.81-07	5.96-07	5.24-07	4.64-07	4.12-07	3.68-07	3.29-07	2.96-07
40	2.58-06	2.15-06	1.82-06	1.54-06	1.32-06	1.14-06	9.93-07	8.69-07	7.64-07	6.75-07	5.99-07	5.34-07	4.78-07	4.29-07
35	4.00-06	3.34-06	2.81-06	2.39-06	2.05-06	1.76-06	1.53-06	1.34-06	1.18-06	1.04-06	9.20-07	8.18-07	7.29-07	6.52-07
30	6.72-06	5.60-06	4.71-06	4.00-06	3.42-06	2.95-06	2.55-06	2.22-06	1.94-06	1.70-06	1.49-06	1.31-06	1.13-06	9.20-07
29	7.55-06	6.29-06	5.29-06	4.49-06	3.84-06	3.30-06	2.86-06	2.48-06	2.17-06	1.89-06	1.65-06	1.42-06	1.15-06	
28	8.53-06	7.10-06	5.97-06	5.06-06	4.32-06	3.71-06	3.21-06	2.78-06	2.42-06	2.10-06	1.79-06	1.45-06		
27	9.68-06	8.06-06	6.77-06	5.73-06	4.89-06	4.20-06	3.62-06	3.13-06	2.70-06	2.30-06	1.85-06			
26	1.11-05	9.20-06	7.72-06	6.53-06	5.57-06	4.77-06	4.09-06	3.51-06	2.97-06	2.38-06				
25	1.27-05	1.06-05	8.86-06	7.49-06	6.36-06	5.43-06	4.62-06	3.90-06	3.11-06					
24	1.47-05	1.22-05	1.02-05	8.63-06	7.30-06	6.18-06	5.18-06	4.11-06						
23	1.72-05	1.43-05	1.19-05	9.99-06	8.40-06	6.98-06	5.50-06							
22	2.03-05	1.67-05	1.39-05	1.16-05	9.58-06	7.50-06								
21	2.41-05	1.98-05	1.64-05	1.34-05	1.04-05									
20	2.88-05	2.36-05	1.91-05	1.47-05										
19	3.48-05	2.80-05	2.14-05											
18	4.21-05	3.18-05												
17	4.88-05													

HE + TE = 3.00+03 NE = 1.00+13 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.03-29	2.34-36	9.48-36	4.53-35	2.01-34	6.10-34	1.16-33	1.67-33	2.17-33	2.66-33	3.26-33	3.93-33	4.74-33	5.70-33
45	1.41-29	3.19-36	1.30-35	6.23-35	2.79-34	8.50-34	1.62-33	2.36-33	3.07-33	3.83-33	4.69-33	5.72-33	6.95-33	8.44-33
40	2.01-29	4.51-36	1.84-35	8.92-35	4.03-34	1.24-33	2.38-33	3.50-33	4.59-33	5.78-33	7.17-33	8.84-33	1.09-32	1.34-32
35	3.01-29	6.66-36	2.73-35	1.34-34	6.14-34	1.91-33	3.72-33	5.53-33	7.37-33	9.42-33	1.19-32	1.49-32	1.88-32	2.37-32
30	4.80-29	1.04-35	4.27-35	2.15-34	1.01-33	3.19-33	6.33-33	9.61-33	1.31-32	1.70-32	2.23-32	2.89-32	3.76-32	4.95-32
29	5.32-29	1.14-35	4.71-35	2.38-34	1.12-33	3.58-33	7.14-33	1.09-32	1.49-32	1.97-32	2.58-32	3.37-32	4.44-32	5.91-32
28	5.92-29	1.26-35	5.21-35	2.65-34	1.26-33	4.04-33	8.10-33	1.24-32	1.72-32	2.28-32	3.01-32	3.98-32	5.31-32	7.16-32
27	6.62-29	1.40-35	5.78-35	2.97-34	1.42-33	4.58-33	9.24-33	1.43-32	1.99-32	2.67-32	3.56-32	4.76-32	6.43-32	8.81-32
26	7.42-29	1.55-35	6.43-35	3.33-34	1.61-33	5.23-33	1.06-32	1.66-32	2.33-32	3.15-32	4.25-32	5.76-32	7.91-32	1.11-31
25	8.36-29	1.73-35	7.18-35	3.76-34	1.83-33	6.01-33	1.23-32	1.94-32	2.75-32	3.77-32	5.15-32	7.09-32	9.93-32	1.42-31
24	9.47-29	1.93-35	8.04-35	4.26-34	2.10-33	6.96-33	1.44-32	2.29-32	3.28-32	4.57-32	6.34-32	8.90-32	1.27-31	1.87-31
23	1.08-28	2.16-35	9.03-35	4.85-34	2.42-33	8.12-33	1.70-32	2.73-32	3.98-32	5.62-32	7.95-32	1.14-31	1.68-31	2.56-31
22	1.24-28	2.43-35	1.02-34	5.55-34	2.82-33	9.58-33	2.03-32	3.31-32	4.89-32	7.05-32	1.02-31	1.51-31	2.30-31	3.66-31
21	1.43-28	2.73-35	1.15-34	6.40-34	3.31-33	1.14-32	2.45-32	4.07-32	6.14-32	9.04-32	1.35-31	2.06-31	3.28-31	5.54-31
20	1.66-28	3.07-35	1.30-34	7.41-34	3.92-33	1.38-32	3.01-32	5.10-32	7.87-32	1.19-31	1.84-31	2.94-31	4.97-31	9.10-31
19	1.94-28	3.46-35	1.46-34	8.63-34	4.69-33	1.69-32	3.77-32	6.53-32	1.04-31	1.63-31	2.62-31	4.45-31	8.16-31	1.68-30
18	2.29-28	3.87-35	1.65-34	1.01-33	5.69-33	2.10-32	4.82-32	8.60-32	1.41-31	2.32-31	3.97-31	7.30-31	1.50-30	3.72-30
17	2.74-28	4.30-35	1.83-34	1.19-33	6.99-33	2.67-32	6.32-32	1.17-31	2.01-31	3.51-31	6.51-31	1.35-30	3.33-30	1.15-29
16	3.31-28	4.68-35	2.00-34	1.40-33	8.71-33	3.47-32	8.16-32	1.66-31	3.04-31	5.74-31	1.20-30	2.98-30	1.03-29	7.95-29
15	4.04-28	4.89-35	2.07-34	1.64-33	1.11-32	4.65-32	1.21-31	2.50-31	4.96-31	1.05-30	2.65-30	9.21-30	7.11-29	
14	5.03-28	4.64-35	1.91-34	1.88-33	1.43-32	6.45-32	1.80-31	4.05-31	9.07-31	2.33-30	8.17-30	6.34-29		
13	6.36-28	3.31-35	1.16-34	2.05-33	1.87-32	9.39-32	2.88-31	7.35-31	1.99-30	7.14-30	5.60-29			
12	8.21-28	-5.83-36	-1.03-34	1.86-33	2.48-32	1.45-31	5.12-31	1.59-30	6.05-30	4.86-29				
11	1.09-27	-1.05-34	-6.80-34	4.87-34	3.21-32	2.42-31	1.07-30	4.72-30	4.05-29					
10	1.49-27	-3.46-34	-2.18-33	-4.75-33	3.53-32	4.48-31	2.99-30	3.03-29						
9	2.12-27	-9.22-34	-6.15-33	-2.32-32	-1.95-34	9.59-31	1.69-29							
8	3.18-27	-2.20-33	-1.65-32	-8.95-32	-3.27-31	2.15-30								
7	5.14-27	-4.33-33	-4.04-32	-3.43-31	-4.19-30									
6	9.23-27	-5.92-33	-8.46-32	-1.76-30										
5	1.97-26	-5.47-33	-2.40-31											
4	5.91-26	4.66-33												
3	4.28-25													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.85-33	8.22-33	9.87-33	1.18-32	1.42-32	1.70-32	2.05-32	2.46-32	2.95-32	3.55-32	4.29-32	5.18-32	6.29-32	7.66-32
45	1.03-32	1.25-32	1.52-32	1.85-32	2.25-32	2.75-32	3.36-32	4.12-32	5.07-32	6.26-32	7.77-32	9.69-32	1.22-31	1.54-31
40	1.66-32	2.05-32	2.55-32	3.17-32	3.96-32	4.97-32	6.27-32	7.95-32	1.02-31	1.31-31	1.71-31	2.26-31	3.02-31	4.13-31
35	3.00-32	3.83-32	4.91-32	6.34-32	8.26-32	1.09-31	1.45-31	1.96-31	2.70-31	3.80-31	5.49-31	8.22-31	1.28-30	2.13-30
30	6.57-32	8.84-32	1.21-31	1.68-31	2.38-31	3.47-31	5.23-31	8.24-31	1.38-30	2.49-30	5.05-30	1.23-29	4.19-29	3.18-28
29	7.96-32	1.09-31	1.51-31	2.15-31	3.14-31	4.75-31	7.50-31	1.25-30	2.27-30	4.61-30	1.13-29	3.84-29	2.91-28	
28	9.80-32	1.37-31	1.94-31	2.84-31	4.30-31	6.81-31	1.14-30	2.06-30	4.20-30	1.03-29	3.51-29	2.43-28		
27	1.23-31	1.75-31	2.57-31	3.89-31	6.16-31	1.03-30	1.88-30	3.82-30	9.36-30	3.20-29	2.22-28			
26	1.58-31	2.32-31	3.51-31	5.57-31	9.35-31	1.70-30	3.47-30	8.51-30	2.91-29	2.02-28				
25	2.08-31	3.17-31	5.02-31	8.45-31	1.54-30	3.14-30	7.72-30	2.65-29	2.02-28					
24	2.85-31	4.53-31	7.62-31	1.39-30	2.84-30	6.99-30	2.40-29	1.83-28						
23	4.07-31	6.86-31	1.25-30	2.56-30	6.31-30	2.17-29	1.66-28							
22	6.17-31	1.13-30	2.31-30	5.69-30	1.96-29	1.50-28								
21	1.01-30	2.08-30	5.13-30	1.77-29	1.36-28									
20	1.87-30	4.62-30	1.59-29	1.22-28										
19	4.15-30	1.43-29	1.10-28											
18	1.29-29	9.88-29												
17	8.87-29													

HE + TE = 5.00+03 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 2.544-12 4-3 RC = 7.067-13 4-3 EM = 2.995-24 2S RC = 6.174-13 2P RC = 1.926-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.75-04	3.09-04	1.74-04	1.12-04	7.80-05	5.71-05	4.33-05	3.37-05	2.68-05	2.16-05	1.78-05	1.48-05	1.24-05	1.05-05
45	1.02-03	4.09-04	2.31-04	1.50-04	1.05-04	7.73-05	5.88-05	4.59-05	3.66-05	2.97-05	2.44-05	2.03-05	1.71-05	1.45-05
40	1.41-03	5.69-04	3.22-04	2.10-04	1.48-04	1.09-04	8.32-05	6.52-05	5.21-05	4.24-05	3.49-05	2.91-05	2.45-05	2.09-05
35	2.06-03	8.34-04	4.74-04	3.10-04	2.19-04	1.62-04	1.24-04	9.74-05	7.80-05	6.35-05	5.25-05	4.38-05	3.70-05	3.15-05
30	3.21-03	1.30-03	7.43-04	4.88-04	3.46-04	2.57-04	1.97-04	1.55-04	1.25-04	1.02-04	8.43-05	7.06-05	5.96-05	5.09-05
29	3.53-03	1.44-03	8.21-04	5.39-04	3.82-04	2.84-04	2.18-04	1.72-04	1.38-04	1.13-04	9.36-05	7.84-05	6.63-05	5.66-05
28	3.91-03	1.59-03	9.09-04	5.98-04	4.25-04	3.16-04	2.43-04	1.92-04	1.54-04	1.26-04	1.04-04	8.75-05	7.40-05	6.32-05
27	4.34-03	1.77-03	1.01-03	6.66-04	4.73-04	3.53-04	2.71-04	2.14-04	1.73-04	1.41-04	1.17-04	9.81-05	8.30-05	7.09-05
26	4.84-03	1.97-03	1.13-03	7.45-04	5.30-04	3.95-04	3.05-04	2.41-04	1.94-04	1.59-04	1.32-04	1.11-04	9.36-05	7.99-05
25	5.41-03	2.21-03	1.27-03	8.37-04	5.96-04	4.45-04	3.43-04	2.72-04	2.19-04	1.80-04	1.49-04	1.25-04	1.06-04	9.05-05
24	6.09-03	2.49-03	1.43-03	9.46-04	6.74-04	5.04-04	3.89-04	3.08-04	2.49-04	2.04-04	1.70-04	1.43-04	1.21-04	1.03-04
23	6.88-03	2.81-03	1.62-03	1.07-03	7.67-04	5.74-04	4.44-04	3.52-04	2.85-04	2.34-04	1.94-04	1.63-04	1.39-04	1.18-04
22	7.82-03	3.20-03	1.85-03	1.23-03	8.77-04	6.57-04	5.09-04	4.04-04	3.27-04	2.69-04	2.24-04	1.89-04	1.60-04	1.37-04
21	8.93-03	3.66-03	2.12-03	1.41-03	1.01-03	7.59-04	5.89-04	4.68-04	3.80-04	3.13-04	2.61-04	2.19-04	1.86-04	1.59-04
20	1.03-02	4.22-03	2.45-03	1.63-03	1.17-03	8.82-04	6.86-04	5.47-04	4.44-04	3.66-04	3.05-04	2.57-04	2.18-04	1.86-04
19	1.19-02	4.90-03	2.85-03	1.91-03	1.37-03	1.04-03	8.07-04	6.44-04	5.24-04	4.33-04	3.62-04	3.05-04	2.59-04	2.20-04
18	1.39-02	5.74-03	3.35-03	2.24-03	1.62-03	1.23-03	9.58-04	7.67-04	6.26-04	5.18-04	4.33-04	3.65-04	3.09-04	2.60-04
17	1.64-02	6.79-03	3.97-03	2.67-03	1.94-03	1.47-03	1.15-03	9.25-04	7.56-04	6.27-04	5.25-04	4.42-04	3.71-04	3.05-04
16	1.95-02	8.11-03	4.76-03	3.22-03	2.34-03	1.78-03	1.40-03	1.13-03	9.27-04	7.70-04	6.45-04	5.40-04	4.43-04	3.34-04
15	2.35-02	9.80-03	5.79-03	3.93-03	2.87-03	2.20-03	1.74-03	1.41-03	1.16-03	9.62-04	8.02-04	6.59-04	4.97-04	
14	2.87-02	1.20-02	7.14-03	4.88-03	3.58-03	2.76-03	2.19-03	1.78-03	1.47-03	1.22-03	1.00-03	7.58-04		
13	3.56-02	1.50-02	8.96-03	6.16-03	4.56-03	3.54-03	2.83-03	2.31-03	1.91-03	1.57-03	1.19-03			
12	4.49-02	1.90-02	1.15-02	7.98-03	5.96-03	4.66-03	3.76-03	3.08-03	2.53-03	1.93-03				
11	5.79-02	2.48-02	1.51-02	1.06-02	8.02-03	6.35-03	5.16-03	4.23-03	3.26-03					
10	7.68-02	3.32-02	2.05-02	1.46-02	1.12-02	9.02-03	7.38-03	5.74-03						
9	1.05-01	4.62-02	2.91-02	2.12-02	1.66-02	1.35-02	1.07-02							
8	1.50-01	6.74-02	4.37-02	3.27-02	2.64-02	2.11-02								
7	2.28-01	1.05-01	7.10-02	5.56-02	4.52-02									
6	3.75-01	1.81-01	1.31-01	1.07-01										
5	6.98-01	3.67-01	2.93-01											
4	1.61+00	1.00+00												
3	5.81+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.98-06	7.74-06	6.71-06	5.85-06	5.13-06	4.52-06	4.01-06	3.56-06	3.18-06	2.85-06	2.56-06	2.31-06	2.08-06	1.89-06
45	1.24-05	1.07-05	9.31-06	8.12-06	7.13-06	6.29-06	5.57-06	4.95-06	4.42-06	3.96-06	3.56-06	3.20-06	2.89-06	2.61-06
40	1.79-05	1.54-05	1.34-05	1.17-05	1.03-05	9.06-06	8.02-06	7.13-06	6.36-06	5.69-06	5.10-06	4.59-06	4.13-06	3.73-06
35	2.70-05	2.33-05	2.03-05	1.77-05	1.55-05	1.37-05	1.21-05	1.08-05	9.58-06	8.54-06	7.61-06	6.82-06	6.10-06	5.45-06
30	4.37-05	3.77-05	3.28-05	2.87-05	2.51-05	2.21-05	1.95-05	1.72-05	1.52-05	1.34-05	1.17-05	1.01-05	8.56-06	6.68-06
29	4.86-05	4.20-05	3.65-05	3.19-05	2.79-05	2.45-05	2.16-05	1.90-05	1.67-05	1.46-05	1.26-05	1.06-05	8.25-06	
28	5.43-05	4.69-05	4.08-05	3.56-05	3.11-05	2.73-05	2.40-05	2.10-05	1.83-05	1.58-05	1.33-05	1.03-05		
27	6.09-05	5.26-05	4.57-05	3.99-05	3.48-05	3.05-05	2.66-05	2.32-05	1.99-05	1.67-05	1.29-05			
26	6.87-05	5.93-05	5.15-05	4.49-05	3.91-05	3.41-05	2.96-05	2.58-05	2.12-05	1.63-05				
25	7.78-05	6.72-05	5.83-05	5.06-05	4.40-05	3.81-05	3.26-05	2.72-05	2.08-05					
24	8.87-05	7.65-05	6.63-05	5.74-05	4.95-05	4.23-05	3.52-05	2.69-05						
23	1.02-04	8.76-05	7.56-05	6.51-05	5.54-05	4.60-05	3.50-05							
22	1.17-04	1.01-04	8.65-05	7.35-05	6.09-05	4.62-05								
21	1.36-04	1.16-04	9.87-05	8.16-05	6.18-05									
20	1.59-04	1.34-04	1.11-04	8.37-05										
19	1.85-04	1.53-04	1.15-04											
18	2.14-04	1.61-04												
17	2.30-04													

HE + TE = 5.00+03 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	5.20-38	9.78-38	2.44-37	5.53-37	1.11-36	2.02-36	3.40-36	5.39-36	8.17-36	1.19-35	1.68-35	2.32-35	3.13-35
45	0.00+00	7.19-38	1.40-37	3.60-37	8.36-37	1.71-36	3.14-36	5.33-36	8.48-36	1.28-35	1.86-35	2.61-35	3.54-35	4.69-35
40	0.00+00	1.03-37	2.06-37	5.42-37	1.28-36	2.66-36	4.95-36	8.50-36	1.37-35	2.09-35	3.05-35	4.28-35	5.82-35	7.68-35
35	0.00+00	1.56-37	3.19-37	8.55-37	2.05-36	4.33-36	8.20-36	1.43-35	2.34-35	3.62-35	5.37-35	7.65-35	1.05-34	1.41-34
30	0.00+00	2.53-37	5.30-37	1.45-36	3.55-36	7.64-36	1.48-35	2.68-35	4.42-35	7.02-35	1.07-34	1.56-34	2.21-34	3.01-34
29	0.00+00	2.81-37	5.92-37	1.63-36	4.02-36	8.68-36	1.69-35	3.03-35	5.11-35	8.17-35	1.25-34	1.84-34	2.63-34	3.60-34
28	0.00+00	3.14-37	6.66-37	1.84-36	4.56-36	9.91-36	1.94-35	3.51-35	5.95-35	9.58-35	1.48-34	2.20-34	3.15-34	4.36-34
27	0.00+00	3.52-37	7.52-37	2.09-36	5.21-36	1.14-35	2.24-35	4.09-35	6.98-35	1.13-34	1.77-34	2.65-34	3.84-34	5.33-34
26	0.00+00	3.97-37	8.53-37	2.39-36	5.93-36	1.32-35	2.62-35	4.80-35	8.27-35	1.36-34	2.13-34	3.24-34	4.73-34	6.63-34
25	0.00+00	4.50-37	9.73-37	2.74-36	6.82-36	1.53-35	3.07-35	5.69-35	9.90-35	1.64-34	2.61-34	4.01-34	5.92-34	8.36-34
24	0.00+00	5.12-37	1.12-36	3.17-36	8.06-36	1.80-35	3.64-35	6.82-35	1.20-34	2.01-34	3.25-34	5.05-34	7.55-34	1.07-33
23	0.00+00	5.87-37	1.29-36	3.69-36	9.47-36	2.14-35	4.37-35	8.27-35	1.47-34	2.51-34	4.11-34	6.49-34	9.84-34	1.40-33
22	0.00+00	6.76-37	1.50-36	4.34-36	1.12-35	2.56-35	5.39-35	1.02-34	1.84-34	3.19-34	5.32-34	8.54-34	1.31-33	1.86-33
21	0.00+00	7.85-37	1.76-36	5.14-36	1.35-35	3.11-35	6.52-35	1.27-34	2.34-34	4.14-34	7.09-34	1.16-33	1.80-33	2.49-33
20	0.00+00	9.19-37	2.09-36	6.16-36	1.63-35	3.83-35	8.16-35	1.62-34	3.05-34	5.52-34	9.63-34	1.62-33	2.53-33	3.23-33
19	0.00+00	1.09-36	2.50-36	7.47-36	2.01-35	4.79-35	1.04-34	2.11-34	4.08-34	7.60-34	1.37-33	2.35-33	3.63-33	3.30-33
18	0.00+00	1.29-36	3.02-36	9.18-36	2.51-35	6.12-35	1.36-34	2.84-34	5.65-34	1.09-33	2.03-33	3.57-33	5.02-33	-3.22-33
17	0.00+00	1.56-36	3.71-36	1.15-35	3.21-35	7.99-35	1.83-34	3.98-34	8.17-34	1.65-33	3.21-33	5.62-33	8.17-33	-7.56-32
16	0.00+00	1.91-36	4.62-36	1.46-35	4.19-35	1.07-34	2.54-34	5.73-34	1.25-33	2.67-33	5.42-33	8.21-33	-3.23-32	-1.63-30
15	0.00+00	2.36-36	5.86-36	1.90-35	5.62-35	1.50-34	3.71-34	8.82-34	2.06-33	4.72-33	9.70-33	-3.63-33	-1.03-30	
14	0.00+00	2.98-36	7.59-36	2.55-35	7.82-35	2.18-34	5.74-34	1.47-33	3.76-33	9.40-33	1.30-32	-5.78-31		
13	0.00+00	3.84-36	1.01-35	3.53-35	1.14-34	3.38-34	9.69-34	2.75-33	8.01-33	2.04-32	-2.58-31			
12	0.00+00	5.07-36	1.39-35	5.11-35	1.76-34	5.71-34	1.83-33	6.12-33	2.13-32	-5.39-32				
11	0.00+00	6.89-36	1.99-35	7.86-35	2.97-34	1.09-33	4.19-33	1.82-32	5.47-32					
10	0.00+00	9.73-36	3.02-35	1.31-34	5.66-34	2.54-33	1.33-32	9.36-32						
9	0.00+00	1.45-35	4.94-35	2.47-34	1.32-33	8.41-33	8.88-32							
8	0.00+00	2.30-35	9.06-35	5.69-34	4.45-33	6.36-32								
7	0.00+00	4.04-35	2.00-34	1.89-33	3.57-32									
6	0.00+00	8.35-35	6.28-34	1.53-32										
5	0.00+00	2.32-34	4.68-33											
4	0.00+00	1.36-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.14-35	5.39-35	6.92-35	8.77-35	1.10-34	1.36-34	1.67-34	2.04-34	2.46-34	2.93-34	3.47-34	4.05-34	4.68-34	5.33-34
45	6.06-35	7.65-35	9.44-35	1.14-34	1.34-34	1.58-34	1.70-34	1.78-34	1.72-34	1.43-34	7.34-35	-5.89-35	-2.91-34	-6.79-34
40	9.85-35	1.23-34	1.48-34	1.71-34	1.88-34	1.90-34	1.65-34	9.03-35	-6.98-35	-3.74-34	-9.20-34	-1.87-33	-3.51-33	-6.30-33
35	1.81-34	2.25-34	2.67-34	2.95-34	2.89-34	2.10-34	-1.31-35	-5.14-34	-1.54-33	-3.58-33	-7.59-33	-1.56-32	-3.20-32	-6.75-32
30	3.94-34	4.89-34	5.57-34	5.28-34	2.48-34	-6.37-34	-2.95-33	-8.66-33	-2.30-32	-6.07-32	-1.71-31	-5.61-31	-2.49-30	-2.39-29
29	4.73-34	5.85-34	6.51-34	5.60-34	4.77-35	-1.52-33	-5.76-33	-1.69-32	-4.75-32	-1.40-31	-4.76-31	-2.19-30	-2.17-29	
28	5.74-34	7.05-34	7.56-34	5.38-34	-4.30-34	-3.40-33	-1.18-32	-3.61-32	-1.12-31	-3.98-31	-1.89-30	-1.94-29		
27	7.05-34	8.55-34	8.58-34	3.71-34	-1.55-33	-7.63-33	-2.63-32	-8.78-32	-3.27-31	-1.62-30	-1.73-29			
26	8.75-34	1.04-33	9.15-34	-1.73-34	-4.29-33	-1.81-32	-6.65-32	-2.63-31	-1.37-30	-1.53-29				
25	1.10-33	1.24-33	8.00-34	-1.74-33	-1.15-32	-4.84-32	-2.06-31	-1.14-30	-1.34-29					
24	1.39-33	1.42-33	1.22-34	-6.33-33	-3.34-32	-1.58-31	-9.28-31	-1.16-29						
23	1.76-33	1.38-33	-2.42-33	-2.13-32	-1.16-31	-7.41-31	-9.85-30							
22	2.14-33	3.73-34	-1.19-32	-8.12-32	-5.76-31	-8.27-30								
21	2.20-33	-4.81-33	-5.31-32	-4.34-31	-6.82-30									
20	1.35-34	-3.11-32	-3.14-31	-5.90-30										
19	-1.47-32	-2.15-31	-4.31-30											
18	-1.36-31	-3.27-30												
17	-2.38-30													

HE + TE = 5.00+03 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 2.552-12 4-3 RC = 7.053-13 4-3 EM = 2.089-24 2S RC = 6.207-13 2P RC = 1.931-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.13-03	4.27-04	2.23-04	1.35-04	8.94-05	6.28-05	4.60-05	3.49-05	2.71-05	2.16-05	1.74-05	1.43-05	1.19-05	9.99-06
45	1.27-03	4.99-04	2.71-04	1.69-04	1.15-04	8.24-05	6.14-05	4.71-05	3.70-05	2.96-05	2.41-05	1.99-05	1.66-05	1.40-05
40	1.58-03	6.30-04	3.51-04	2.25-04	1.56-04	1.13-04	8.55-05	6.63-05	5.25-05	4.23-05	3.46-05	2.87-05	2.41-05	2.04-05
35	2.18-03	8.75-04	4.94-04	3.21-04	2.25-04	1.65-04	1.26-04	9.82-05	7.83-05	6.34-05	5.22-05	4.34-05	3.65-05	3.10-05
30	3.29-03	1.33-03	7.58-04	4.97-04	3.50-04	2.59-04	1.99-04	1.56-04	1.25-04	1.02-04	8.39-05	7.00-05	5.90-05	5.02-05
29	3.61-03	1.46-03	8.35-04	5.48-04	3.87-04	2.87-04	2.20-04	1.73-04	1.39-04	1.13-04	9.32-05	7.78-05	6.56-05	5.58-05
28	3.99-03	1.62-03	9.24-04	6.07-04	4.29-04	3.19-04	2.44-04	1.92-04	1.54-04	1.26-04	1.04-04	8.68-05	7.33-05	6.23-05
27	4.41-03	1.79-03	1.03-03	6.75-04	4.78-04	3.55-04	2.73-04	2.15-04	1.73-04	1.41-04	1.16-04	9.73-05	8.21-05	6.99-05
26	4.91-03	2.00-03	1.14-03	7.54-04	5.35-04	3.98-04	3.06-04	2.41-04	1.94-04	1.58-04	1.31-04	1.10-04	9.26-05	7.88-05
25	5.49-03	2.24-03	1.28-03	8.46-04	6.01-04	4.48-04	3.45-04	2.72-04	2.19-04	1.79-04	1.48-04	1.24-04	1.05-04	8.93-05
24	6.16-03	2.52-03	1.45-03	9.55-04	6.79-04	5.07-04	3.91-04	3.09-04	2.49-04	2.03-04	1.69-04	1.41-04	1.19-04	1.02-04
23	6.96-03	2.84-03	1.64-03	1.08-03	7.72-04	5.77-04	4.45-04	3.52-04	2.84-04	2.33-04	1.93-04	1.62-04	1.37-04	1.17-04
22	7.90-03	3.23-03	1.87-03	1.24-03	8.83-04	6.61-04	5.11-04	4.05-04	3.27-04	2.68-04	2.22-04	1.87-04	1.58-04	1.35-04
21	9.02-03	3.70-03	2.14-03	1.42-03	1.02-03	7.62-04	5.90-04	4.68-04	3.79-04	3.11-04	2.58-04	2.17-04	1.84-04	1.56-04
20	1.04-02	4.26-03	2.47-03	1.64-03	1.18-03	8.86-04	6.88-04	5.47-04	4.43-04	3.64-04	3.03-04	2.54-04	2.15-04	1.83-04
19	1.20-02	4.95-03	2.87-03	1.92-03	1.38-03	1.04-03	8.08-04	6.44-04	5.22-04	4.30-04	3.58-04	3.01-04	2.55-04	2.16-04
18	1.40-02	5.79-03	3.38-03	2.26-03	1.63-03	1.23-03	9.60-04	7.66-04	6.23-04	5.14-04	4.28-04	3.60-04	3.04-04	2.55-04
17	1.65-02	6.85-03	4.00-03	2.69-03	1.95-03	1.47-03	1.15-03	9.23-04	7.52-04	6.22-04	5.19-04	4.35-04	3.64-04	3.01-04
16	1.97-02	8.18-03	4.80-03	3.24-03	2.35-03	1.79-03	1.40-03	1.13-03	9.22-04	7.63-04	6.36-04	5.31-04	4.37-04	3.36-04
15	2.37-02	9.88-03	5.83-03	3.96-03	2.89-03	2.20-03	1.74-03	1.40-03	1.15-03	9.51-04	7.90-04	6.48-04	4.98-04	
14	2.89-02	1.21-02	7.19-03	4.91-03	3.60-03	2.77-03	2.19-03	1.77-03	1.46-03	1.20-03	9.86-04	7.57-04		
13	3.59-02	1.51-02	9.03-03	6.20-03	4.58-03	3.54-03	2.82-03	2.30-03	1.89-03	1.54-03	1.19-03			
12	4.53-02	1.92-02	1.16-02	8.02-03	5.98-03	4.66-03	3.74-03	3.06-03	2.49-03	1.92-03				
11	5.84-02	2.50-02	1.52-02	1.07-02	8.05-03	6.34-03	5.13-03	4.18-03	3.23-03					
10	7.74-02	3.35-02	2.07-02	1.47-02	1.13-02	8.99-03	7.31-03	5.69-03						
9	1.06-01	4.65-02	2.93-02	2.13-02	1.66-02	1.34-02	1.06-02							
8	1.52-01	6.79-02	4.39-02	3.28-02	2.63-02	2.09-02								
7	2.30-01	1.06-01	7.13-02	5.56-02	4.49-02									
6	3.78-01	1.82-01	1.31-01	1.07-01										
5	7.03-01	3.69-01	2.92-01											
4	1.62+00	1.00+00												
3	5.83+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.48-06	7.26-06	6.26-06	5.44-06	4.75-06	4.18-06	3.69-06	3.28-06	2.92-06	2.61-06	2.35-06	2.12-06	1.91-06	1.74-06
45	1.19-05	1.02-05	8.86-06	7.71-06	6.75-06	5.94-06	5.25-06	4.66-06	4.16-06	3.72-06	3.35-06	3.02-06	2.73-06	2.47-06
40	1.74-05	1.50-05	1.30-05	1.13-05	9.89-06	8.71-06	7.70-06	6.84-06	6.10-06	5.46-06	4.90-06	4.41-06	3.98-06	3.60-06
35	2.65-05	2.28-05	1.98-05	1.73-05	1.51-05	1.33-05	1.18-05	1.04-05	9.30-06	8.31-06	7.43-06	6.66-06	5.98-06	5.37-06
30	4.30-05	3.71-05	3.22-05	2.80-05	2.46-05	2.16-05	1.90-05	1.68-05	1.49-05	1.32-05	1.16-05	1.02-05	8.77-06	7.09-06
29	4.78-05	4.13-05	3.58-05	3.12-05	2.73-05	2.40-05	2.11-05	1.86-05	1.64-05	1.44-05	1.26-05	1.08-05	8.73-06	
28	5.34-05	4.61-05	4.00-05	3.48-05	3.05-05	2.67-05	2.35-05	2.06-05	1.81-05	1.58-05	1.35-05	1.08-05		
27	5.99-05	5.17-05	4.48-05	3.90-05	3.41-05	2.98-05	2.61-05	2.28-05	1.98-05	1.69-05	1.35-05			
26	6.76-05	5.83-05	5.05-05	4.39-05	3.83-05	3.34-05	2.91-05	2.52-05	2.14-05	1.71-05				
25	7.65-05	6.60-05	5.71-05	4.96-05	4.31-05	3.74-05	3.23-05	2.74-05	2.17-05					
24	8.72-05	7.51-05	6.49-05	5.62-05	4.86-05	4.18-05	3.53-05	2.79-05						
23	9.99-05	8.59-05	7.41-05	6.39-05	5.47-05	4.61-05	3.63-05							
22	1.15-04	9.88-05	8.48-05	7.24-05	6.08-05	4.77-05								
21	1.34-04	1.14-04	9.71-05	8.12-05	6.35-05									
20	1.56-04	1.32-04	1.10-04	8.56-05										
19	1.82-04	1.51-04	1.17-04											
18	2.11-04	1.63-04												
17	2.32-04													

HE + TE = 5.00+03 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	4.32-38	4.42-38	6.03-38	9.38-38	1.76-37	3.90-37	9.05-37	2.01-36	4.18-36	8.09-36	1.48-35	2.56-35	4.24-35
45	0.00+00	6.84-38	1.06-37	2.26-37	4.72-37	9.23-37	1.71-36	3.05-36	5.28-36	8.88-36	1.46-35	2.34-35	3.67-35	5.66-35
40	0.00+00	1.03-37	1.88-37	4.54-37	1.02-36	2.05-36	3.77-36	6.50-36	1.07-35	1.69-35	2.58-35	3.87-35	5.68-35	8.20-35
35	0.00+00	1.57-37	3.09-37	7.98-37	1.87-36	3.86-36	7.22-36	1.25-35	2.05-35	3.19-35	4.79-35	6.97-35	9.89-35	1.38-34
30	0.00+00	2.54-37	5.23-37	1.40-36	3.40-36	7.22-36	1.38-35	2.45-35	4.08-35	6.45-35	9.79-35	1.44-34	2.04-34	2.83-34
29	0.00+00	2.83-37	5.86-37	1.58-36	3.86-36	8.25-36	1.59-35	2.83-35	4.74-35	7.54-35	1.15-34	1.70-34	2.43-34	3.37-34
28	0.00+00	3.16-37	6.59-37	1.80-36	4.40-36	9.47-36	1.84-35	3.29-35	5.55-35	8.88-35	1.36-34	2.02-34	2.91-34	4.07-34
27	0.00+00	3.54-37	7.44-37	2.04-36	5.04-36	1.09-35	2.13-35	3.85-35	6.54-35	1.05-34	1.63-34	2.44-34	3.54-34	4.98-34
26	0.00+00	3.99-37	8.45-37	2.34-36	5.80-36	1.27-35	2.50-35	4.54-35	7.77-35	1.27-34	1.98-34	2.99-34	4.37-34	6.20-34
25	0.00+00	4.51-37	9.65-37	2.69-36	6.73-36	1.48-35	2.94-35	5.40-35	9.33-35	1.53-34	2.43-34	3.71-34	5.48-34	7.84-34
24	0.00+00	5.14-37	1.11-36	3.11-36	7.85-36	1.74-35	3.50-35	6.49-35	1.13-34	1.89-34	3.02-34	4.68-34	7.01-34	1.01-33
23	0.00+00	5.88-37	1.28-36	3.63-36	9.24-36	2.07-35	4.20-35	7.88-35	1.39-34	2.36-34	3.83-34	6.03-34	9.17-34	1.34-33
22	0.00+00	6.78-37	1.49-36	4.27-36	1.10-35	2.49-35	5.10-35	9.71-35	1.74-34	2.99-34	4.96-34	7.95-34	1.23-33	1.82-33
21	0.00+00	7.87-37	1.75-36	5.06-36	1.32-35	3.02-35	6.29-35	1.22-34	2.22-34	3.89-34	6.59-34	1.08-33	1.71-33	2.54-33
20	0.00+00	9.22-37	2.07-36	6.07-36	1.60-35	3.72-35	7.87-35	1.55-34	2.90-34	5.19-34	9.02-34	1.52-33	2.46-33	3.62-33
19	0.00+00	1.09-36	2.48-36	7.37-36	1.97-35	4.66-35	1.00-34	2.02-34	3.88-34	7.16-34	1.29-33	2.24-33	3.69-33	5.05-33
18	0.00+00	1.30-36	3.00-36	9.06-36	2.46-35	5.95-35	1.31-34	2.72-34	5.37-34	1.03-33	1.92-33	3.48-33	5.73-33	5.13-33
17	0.00+00	1.57-36	3.69-36	1.13-35	3.14-35	7.78-35	1.77-34	3.78-34	7.77-34	1.56-33	3.07-33	5.77-33	8.48-33	-1.86-32
16	0.00+00	1.91-36	4.59-36	1.44-35	4.10-35	1.05-34	2.46-34	5.49-34	1.19-33	2.54-33	5.32-33	1.01-32	1.03-33	-6.33-31
15	0.00+00	2.37-36	5.83-36	1.88-35	5.51-35	1.46-34	3.58-34	8.45-34	1.96-33	4.54-33	1.02-32	1.40-32	-3.89-31	
14	0.00+00	2.99-36	7.55-36	2.51-35	7.67-35	2.12-34	5.54-34	1.41-33	3.60-33	9.35-33	2.11-32	-1.94-31		
13	0.00+00	3.85-36	1.01-35	3.48-35	1.12-34	3.29-34	9.32-34	2.64-33	7.77-33	2.33-32	-5.04-32			
12	0.00+00	5.08-36	1.38-35	5.05-35	1.73-34	5.55-34	1.77-33	5.89-33	2.17-32	4.36-32				
11	0.00+00	6.91-36	1.98-35	7.75-35	2.91-34	1.06-33	4.04-33	1.78-32	9.20-32					
10	0.00+00	9.76-36	3.00-35	1.29-34	5.54-34	2.46-33	1.29-32	1.03-31						
9	0.00+00	1.45-35	4.91-35	2.44-34	1.29-33	8.14-33	8.87-32							
8	0.00+00	2.31-35	9.00-35	5.60-34	4.33-33	6.19-32								
7	0.00+00	4.05-35	1.99-34	1.86-33	3.47-32									
6	0.00+00	8.37-35	6.23-34	1.46-32										
5	0.00+00	2.33-34	4.63-33											
4	0.00+00	1.36-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.79-35	1.05-34	1.60-34	2.36-34	3.44-34	4.92-34	6.96-34	9.72-34	1.35-33	1.85-33	2.52-33	3.43-33	4.64-33	6.27-33
45	8.55-35	1.27-34	1.86-34	2.69-34	3.86-34	5.47-34	7.69-34	1.07-33	1.49-33	2.07-33	2.87-33	3.96-33	5.48-33	7.59-33
40	1.17-34	1.65-34	2.32-34	3.23-34	4.47-34	6.18-34	8.53-34	1.18-33	1.63-33	2.26-33	3.15-33	4.43-33	6.27-33	8.99-33
35	1.88-34	2.54-34	3.37-34	4.44-34	5.79-34	7.48-34	9.57-34	1.21-33	1.51-33	1.83-33	2.13-33	2.25-33	1.82-33	-2.10-34
30	3.82-34	5.01-34	6.35-34	7.66-34	8.49-34	7.72-34	2.76-34	-1.27-33	-5.52-33	-1.70-32	-5.07-32	-1.66-31	-7.07-31	-6.18-30
29	4.96-34	5.96-34	7.47-34	8.72-34	8.83-34	5.55-34	-6.68-34	-4.26-33	-1.44-32	-4.50-32	-1.52-31	-6.67-31	-6.00-30	
28	5.51-34	7.19-34	8.87-34	9.87-34	8.40-34	-2.29-35	-2.87-33	-1.14-32	-3.82-32	-1.35-31	-6.12-31	-5.70-30		
27	6.77-34	8.79-34	1.06-33	1.09-33	5.81-34	-1.51-33	-8.39-33	-3.11-32	-1.16-31	-5.50-31	-5.31-30			
26	8.45-34	1.09-33	1.27-33	1.09-33	-2.75-34	-5.49-33	-2.40-32	-9.69-32	-4.82-31	-4.87-30				
25	1.07-33	1.37-33	1.47-33	7.63-34	-2.89-33	-1.73-32	-7.80-32	-4.14-31	-4.39-30					
24	1.39-33	1.72-33	1.57-33	-6.83-34	-1.14-32	-6.02-32	-3.46-31	-3.90-30						
23	1.83-33	2.12-33	1.07-33	-6.20-33	-4.39-32	-2.82-31	-3.41-30							
22	2.44-33	2.36-33	-1.98-33	-2.97-32	-2.22-31	-2.93-30								
21	3.19-33	1.28-33	-1.76-32	-1.68-31	-2.47-30									
20	3.60-33	-7.78-33	-1.20-31	-2.03-30										
19	-2.32-34	-7.91-32	-1.63-30											
18	-4.52-32	-1.26-30												
17	-9.23-31													

HE + TE = 5.00+03 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 2.567-12 4-3 RC = 6.979-13 4-3 EM = 2.958-24 2S RC = 6.287-13 2P RC = 1.938-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.40-03	7.77-04	3.51-04	1.90-04	1.15-04	7.54-05	5.23-05	3.78-05	2.83-05	2.18-05	1.71-05	1.37-05	1.12-05	9.23-06
45	2.62-03	8.84-04	4.14-04	2.31-04	1.44-04	9.60-05	6.77-05	4.97-05	3.76-05	2.92-05	2.32-05	1.87-05	1.54-05	1.28-05
40	2.77-03	9.97-04	4.94-04	2.88-04	1.85-04	1.27-04	9.16-05	6.84-05	5.26-05	4.14-05	3.32-05	2.71-05	2.24-05	1.87-05
35	3.03-03	1.17-03	6.19-04	3.79-04	2.53-04	1.79-04	1.32-04	1.00-04	7.82-05	6.23-05	5.05-05	4.15-05	3.45-05	2.90-05
30	3.84-03	1.53-03	8.52-04	5.44-04	3.75-04	2.72-04	2.04-04	1.58-04	1.25-04	1.00-04	8.20-05	6.79-05	5.68-05	4.79-05
29	4.12-03	1.65-03	9.23-04	5.93-04	4.11-04	2.99-04	2.26-04	1.75-04	1.39-04	1.12-04	9.13-05	7.56-05	6.33-05	5.35-05
28	4.45-03	1.79-03	1.01-03	6.49-04	4.52-04	3.31-04	2.50-04	1.94-04	1.54-04	1.24-04	1.02-04	8.45-05	7.08-05	5.99-05
27	4.85-03	1.95-03	1.10-03	7.15-04	5.00-04	3.67-04	2.78-04	2.17-04	1.72-04	1.39-04	1.14-04	9.49-05	7.95-05	6.73-05
26	5.32-03	2.15-03	1.22-03	7.93-04	5.56-04	4.09-04	3.11-04	2.43-04	1.94-04	1.57-04	1.29-04	1.07-04	8.97-05	7.59-05
25	5.87-03	2.38-03	1.35-03	8.84-04	6.22-04	4.59-04	3.50-04	2.74-04	2.19-04	1.77-04	1.46-04	1.21-04	1.02-04	8.61-05
24	6.53-03	2.65-03	1.51-03	9.92-04	7.00-04	5.18-04	3.96-04	3.10-04	2.48-04	2.02-04	1.66-04	1.38-04	1.16-04	9.81-05
23	7.32-03	2.98-03	1.70-03	1.12-03	7.93-04	5.88-04	4.51-04	3.54-04	2.83-04	2.30-04	1.90-04	1.58-04	1.33-04	1.12-04
22	8.26-03	3.37-03	1.93-03	1.27-03	9.04-04	6.72-04	5.16-04	4.06-04	3.26-04	2.65-04	2.19-04	1.82-04	1.53-04	1.30-04
21	9.38-03	3.84-03	2.21-03	1.46-03	1.04-03	7.74-04	5.96-04	4.70-04	3.77-04	3.08-04	2.54-04	2.12-04	1.78-04	1.50-04
20	1.07-02	4.40-03	2.54-03	1.69-03	1.20-03	8.99-04	6.93-04	5.48-04	4.40-04	3.60-04	2.97-04	2.48-04	2.08-04	1.75-04
19	1.24-02	5.10-03	2.95-03	1.96-03	1.41-03	1.05-03	8.14-04	6.48-04	5.19-04	4.24-04	3.51-04	2.92-04	2.45-04	2.06-04
18	1.45-02	5.96-03	3.46-03	2.31-03	1.66-03	1.25-03	9.66-04	7.66-04	6.18-04	5.06-04	4.18-04	3.48-04	2.91-04	2.43-04
17	1.70-02	7 03-03	4.10-03	2.75-03	1.98-03	1.49-03	1.16-03	9.21-04	7.45-04	6.10-04	5.05-04	4.19-04	3.48-04	2.85-04
16	2.02-02	8.39-03	4.92-03	3.31-03	2.39-03	1.81-03	1.41-03	1.12-03	9.10-04	7.46-04	6.16-04	5.09-04	4.15-04	3.18-04
15	2.43-02	1.01-02	5.97-03	4.03-03	2.93-03	2.22-03	1.74-03	1.39-03	1.13-03	9.26-04	7.61-04	6.18-04	4.72-04	
14	2.97-02	1.24-02	7.35-03	5.00-03	3.65-03	2.79-03	2.19-03	1.76-03	1.43-03	1.17-03	9.44-04	7.18-04		
13	3.68-02	1.55-02	9.23-03	6.31-03	4.64-03	3.56-03	2.82-03	2.27-03	1.84-03	1.48-03	1.13-03			
12	4.64-02	1.97-02	1.18-02	8.16-03	6.05-03	4.68-03	3.72-03	3.00-03	2.41-03	1.83-03				
11	5.99-02	2.56-02	1.55-02	1.08-02	8.12-03	6.34-03	5.07-03	4.06-03	3.08-03					
10	7.93-02	3.43-02	2.11-02	1.49-02	1.13-02	8.94-03	7.15-03	5.45-03						
9	1.09-01	4.76-02	2.99-02	2.15-02	1.66-02	1.32-02	1.02-02							
8	1.55-01	6.94-02	4.47-02	3.31-02	2.61-02	2.03-02								
7	2.35-01	1.08-01	7.24-02	5.56-02	4.38-02									
6	3.87-01	1.86-01	1.32-01	1.05-01										
5	7.20-01	3.75-01	2.90-01											
4	1.66+00	1.00+00												
3	5.90+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.71-06	6.51-06	5.55-06	4.77-06	4.13-06	3.60-06	3.16-06	2.78-06	2.47-06	2.20-06	1.97-06	1.77-06	1.59-06	1.44-06
45	1.07-05	9.10-06	7.79-06	6.72-06	5.84-06	5.11-06	4.49-06	3.97-06	3.53-06	3.15-06	2.82-06	2.54-06	2.29-06	2.07-06
40	1.58-05	1.35-05	1.16-05	1.00-05	8.73-06	7.65-06	6.75-06	5.97-06	5.32-06	4.75-06	4.26-06	3.83-06	3.46-06	3.13-06
35	2.46-05	2.11-05	1.82-05	1.58-05	1.38-05	1.21-05	1.07-05	9.48-06	8.39-06	7.49-06	6.70-06	6.01-06	5.41-06	4.87-06
30	4.08-05	3.50-05	3.02-05	2.62-05	2.29-05	2.01-05	1.77-05	1.56-05	1.38-05	1.22-05	1.08-05	9.48-06	8.21-06	6.69-06
29	4.55-05	3.91-05	3.37-05	2.93-05	2.55-05	2.24-05	1.97-05	1.73-05	1.53-05	1.34-05	1.18-05	1.02-05	8.25-06	
28	5.10-05	4.38-05	3.78-05	3.28-05	2.86-05	2.50-05	2.19-05	1.92-05	1.69-05	1.47-05	1.27-05	1.02-05		
27	5.73-05	4.92-05	4.24-05	3.68-05	3.20-05	2.80-05	2.45-05	2.14-05	1.86-05	1.59-05	1.28-05			
26	6.47-05	5.55-05	4.79-05	4.15-05	3.60-05	3.14-05	2.73-05	2.36-05	2.02-05	1.62-05				
25	7.34-05	6.29-05	5.42-05	4.69-05	4.06-05	3.52-05	3.03-05	2.58-05	2.06-05					
24	8.36-05	7.16-05	6.16-05	5.31-05	4.58-05	3.93-05	3.33-05	2.65-05						
23	9.57-05	8.19-05	7.02-05	6.03-05	5.15-05	4.34-05	3.44-05							
22	1.10-04	9.40-05	8.03-05	6.83-05	5.73-05	4.52-05								
21	1.28-04	1.08-04	9.18-05	7.66-05	6.01-05									
20	1.48-04	1.25-04	1.04-04	8.11-05										
19	1.73-04	1.43-04	1.11-04											
18	2.00-04	1.55-04												
17	2.20-04													

HE + TE = 5.00+03 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-5.86-39	-1.59-37	-5.15-37	-1.19-36	-2.27-36	-3.71-36	-5.33-36	-6.65-36	-6.83-36	-4.52-36	2.33-36	1.66-35	4.26-35
45	0.00+00	1.94-38	-1.10-37	-4.02-37	-9.54-37	-1.80-36	-2.83-36	-3.73-36	-3.82-36	-1.95-36	3.75-36	1.61-35	3.91-35	7.87-35
40	0.00+00	6.61-38	-3.67-40	-1.36-37	-3.81-37	-6.97-37	-8.80-37	-4.55-37	1.47-36	6.40-36	1.67-35	3.61-35	7.00-35	1.26-34
35	0.00+00	1.40-37	1.81-37	3.32-37	6.57-37	1.33-36	2.71-36	5.47-36	1.07-35	2.04-35	3.74-35	6.62-35	1.14-34	1.91-34
30	0.00+00	2.52-37	4.53-37	1.09-36	2.45-36	5.01-36	9.50-36	1.70-35	2.92-35	4.85-35	7.88-35	1.26-34	1.98-34	3.10-34
29	0.00+00	2.83-37	5.25-37	1.29-36	2.95-36	6.09-36	1.16-35	2.06-35	3.51-35	5.73-35	9.27-35	1.46-34	2.27-34	3.51-34
28	0.00+00	3.17-37	6.05-37	1.52-36	3.53-36	7.34-36	1.40-35	2.49-35	4.23-35	6.91-35	1.10-34	1.71-34	2.64-34	4.03-34
27	0.00+00	3.56-37	6.96-37	1.78-36	4.20-36	8.80-36	1.69-35	3.01-35	5.11-35	8.32-35	1.32-34	2.04-34	3.11-34	4.70-34
26	0.00+00	4.02-37	8.01-37	2.09-36	4.98-36	1.05-35	2.03-35	3.64-35	6.19-35	1.01-34	1.59-34	2.46-34	3.72-34	5.58-34
25	0.00+00	4.55-37	9.23-37	2.45-36	5.90-36	1.26-35	2.45-35	4.43-35	7.55-35	1.23-34	1.95-34	3.01-34	4.55-34	6.77-34
24	0.00+00	5.18-37	1.07-36	2.87-36	7.01-36	1.52-35	2.97-35	5.41-35	9.29-35	1.53-34	2.43-34	3.75-34	5.67-34	8.40-34
23	0.00+00	5.93-37	1.24-36	3.38-36	8.36-36	1.83-35	3.62-35	6.66-35	1.16-34	1.92-34	3.07-34	4.77-34	7.24-34	1.07-33
22	0.00+00	6.83-37	1.45-36	4.01-36	1.00-35	2.22-35	4.45-35	8.28-35	1.46-34	2.44-34	3.96-34	6.23-34	9.51-34	1.40-33
21	0.00+00	7.93-37	1.70-36	4.78-36	1.21-35	2.72-35	5.53-35	1.04-34	1.86-34	3.18-34	5.24-34	8.36-34	1.29-33	1.89-33
20	0.00+00	9.27-37	2.02-36	5.75-36	1.48-35	3.37-35	6.97-35	1.34-34	2.44-34	4.24-34	7.14-34	1.16-33	1.81-33	2.58-33
19	0.00+00	1.09-36	2.42-36	7.00-36	1.83-35	4.24-35	8.94-35	1.75-34	3.27-34	5.84-34	1.01-33	1.68-33	2.65-33	3.45-33
18	0.00+00	1.30-36	2.94-36	8.63-36	2.30-35	5.43-35	1.17-34	2.36-34	4.52-34	8.35-34	1.50-33	2.57-33	3.97-33	3.27-33
17	0.00+00	1.57-36	3.61-36	1.08-35	2.94-35	7.11-35	1.58-34	3.28-34	6.52-34	1.26-33	2.35-33	4.15-33	5.60-33	-1.20-32
16	0.00+00	1.92-36	4.50-36	1.38-35	3.84-35	9.58-35	2.20-34	4.75-34	9.92-34	2.02-33	4.00-33	7.00-33	1.10-34	-3.60-31
15	0.00+00	2.38-36	5.71-36	1.80-35	5.16-35	1.33-34	3.20-34	7.29-34	1.62-33	3.56-33	7.47-33	9.01-33	-2.33-31	
14	0.00+00	3.00-36	7.40-36	2.41-35	7.19-35	1.94-34	4.93-34	1.21-33	2.94-33	7.14-33	1.46-32	-1.24-31		
13	0.00+00	3.87-36	9.85-36	3.34-35	1.05-34	3.01-34	8.24-34	2.24-33	6.20-33	1.70-32	-3.65-32			
12	0.00+00	5.10-36	1.35-35	4.83-35	1.62-34	5.05-34	1.55-33	4.90-33	1.67-32	2.67-32				
11	0.00+00	6.94-36	1.94-35	7.42-35	2.71-34	9.57-34	3.49-33	1.44-32	6.42-32					
10	0.00+00	9.80-36	2.94-35	1.24-34	5.15-34	2.20-33	1.09-32	7.74-32						
9	0.00+00	1.46-35	4.81-35	2.33-34	1.19-33	7.14-33	7.09-32							
8	0.00+00	2.32-35	8.80-35	5.32-34	3.94-33	5.23-32								
7	0.00+00	4.07-35	1.94-34	1.75-33	3.08-32									
6	0.00+00	8.39-35	6.04-34	1.38-32										
5	0.00+00	2.33-34	# 44-33											
4	0.00+00	1.35-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.58-35	1.54-34	2.58-34	4.11-34	6.32-34	9.45-34	1.38-33	1.99-33	2.82-33	3.95-33	5.47-33	7.54-33	1.03-32	1.40-32
45	1.43-34	2.43-34	3.96-34	6.22-34	9.52-34	1.43-33	2.10-33	3.06-33	4.40-33	6.28-33	8.92-33	1.26-32	1.78-32	2.52-32
40	2.17-34	3.57-34	5.72-34	8.96-34	1.38-33	2.09-33	3.13-33	4.66-33	6.91-33	1.02-32	1.51-32	2.25-32	3.36-32	5.08-32
35	3.13-34	5.04-34	8.00-34	1.26-33	1.96-33	3.05-33	4.74-33	7.37-33	1.16-32	1.83-32	2.95-32	4.87-32	8.32-32	1.49-31
30	4.84-34	7.54-34	1.18-33	1.86-33	2.96-33	4.79-33	7.92-33	1.35-32	2.40-32	4.55-32	9.52-32	2.35-31	7.92-31	5.97-30
29	5.42-34	8.37-34	1.30-33	2.04-33	3.26-33	5.31-33	8.91-33	1.56-32	2.90-32	5.92-32	1.42-31	4.62-31	3.38-30	
28	6.15-34	9.40-34	1.45-33	2.26-33	3.60-33	5.88-33	9.97-33	1.78-32	3.48-32	7.81-32	2.36-31	1.60-30		
27	7.09-34	1.07-33	1.63-33	2.51-33	3.94-33	6.35-33	1.06-32	1.88-32	3.65-32	8.53-32	4.08-31			
26	8.32-34	1.24-33	1.85-33	2.76-33	4.16-33	6.25-33	9.07-33	1.07-32	-8.60-33	-3.61-31				
25	9.97-34	1.45-33	2.09-33	2.93-33	3.81-33	3.65-33	-3.71-33	-6.24-32	-8.17-31					
24	1.22-33	1.73-33	2.31-33	2.64-33	1.12-33	-1.04-32	-8.84-32	-1.06-30						
23	1.53-33	2.04-33	2.24-33	4.35-34	-1.21-32	-9.53-32	-1.15-30							
22	1.94-33	2.25-33	8.06-34	-1.06-32	-9.00-32	-1.14-30								
21	2.42-33	1.67-33	-7.41-33	-7.74-32	-1.06-30									
20	2.63-33	-3.61-33	-6,11-32	-9.39-31										
19	1.06-34	-4.36-32	-7.98-31											
18	-2.68-32	-6.49-31												
17	-5.00-31													

HE + TE = 5.00+03 NE = 1.00+05 CASE B NC = 70

TOTAL RC = 2.597-12 4-3 RC = 6.860-13 4-3 EM = 2.907-24 2S RC = 6.439-13 2P RC = 1.953-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.65-03	1.13-03	4.88-04	2.55-04	1.50-04	9.52-05	6.44-05	4.56-05	3.35-05	2.53-05	1.96-05	1.55-05	1.25-05	1.02-05
45	4.39-03	1.37-03	5.95-04	3.12-04	1.84-04	1.18-04	8.01-05	5.69-05	4.19-05	3.18-05	2.47-05	1.96-05	1.58-05	1.29-05
40	5.35-03	1.69-03	7.47-04	3.97-04	2.37-04	1.53-04	1.05-04	7.51-05	5.57-05	4.25-05	3.32-05	2.64-05	2.14-05	1.76-05
35	6.33-03	2.07-03	9.43-04	5.15-04	3.14-04	2.07-04	1.44-04	1.05-04	7.88-05	6.08-05	4.79-05	3.85-05	3.14-05	2.59-05
30	7.06-03	2.48-03	1.21-03	6.93-04	4.41-04	3.00-04	2.15-04	1.59-04	1.22-04	9.55-05	7.63-05	6.20-05	5.10-05	4.25-05
29	7.20-03	2.58-03	1.28-03	7.43-04	4.77-04	3.27-04	2.35-04	1.76-04	1.35-04	1.06-04	8.49-05	6.91-05	5.70-05	4.76-05
28	7.35-03	2.69-03	1.35-03	7.99-04	5.18-04	3.58-04	2.59-04	1.95-04	1.50-04	1.18-04	9.50-05	7.75-05	6.41-05	5.36-05
27	7.54-03	2.82-03	1.44-03	8.63-04	5.66-04	3.95-04	2.88-04	2.17-04	1.68-04	1.33-04	1.07-04	8.74-05	7.23-05	6.05-05
26	7.78-03	2.96-03	1.55-03	9.39-04	6.22-04	4.37-04	3.20-04	2.43-04	1.89-04	1.50-04	1.21-04	9.89-05	8.20-05	6.87-05
25	8.12-03	3.14-03	1.67-03	1.03-03	6.87-04	4.87-04	3.59-04	2.73-04	2.13-04	1.70-04	1.37-04	1.13-04	9.35-05	7.84-05
24	8.56-03	3.36-03	1.82-03	1.13-03	7.64-04	5.45-04	4.05-04	3.10-04	2.42-04	1.93-04	1.57-04	1.29-04	1.07-04	8.98-05
23	9.14-03	3.63-03	1.99-03	1.26-03	8.56-04	6.15-04	4.59-04	3.53-04	2.77-04	2.22-04	1.80-04	1.48-04	1.23-04	1.03-04
22	9.91-03	3.97-03	2.20-03	1.40-03	9.67-04	7.00-04	5.25-04	4.05-04	3.19-04	2.56-04	2.08-04	1.71-04	1.43-04	1.20-04
21	1.09-02	4.39-03	2.46-03	1.59-03	1.10-03	8.01-04	6.04-04	4.68-04	3.70-04	2.97-04	2.42-04	2.00-04	1.66-04	1.39-04
20	1.21-02	4.92-03	2.79-03	1.81-03	1.26-03	9.26-04	7.01-04	5.45-04	4.32-04	3.48-04	2.84-04	2.34-04	1.95-04	1.63-04
19	1.37-02	5.58-03	3.19-03	2.08-03	1.47-03	1.08-03	8.21-04	6.40-04	5.09-04	4.10-04	3.35-04	2.76-04	2.29-04	1.91-04
18	1.57-02	6.43-03	3.69-03	2.43-03	1.72-03	1.27-03	9.72-04	7.60-04	6.05-04	4.89-04	3.99-04	3.29-04	2.72-04	2.25-04
17	1.83-02	7.51-03	4.34-03	2.87-03	2.04-03	1.52-03	1.16-03	9.12-04	7.28-04	5.89-04	4.81-04	3.95-04	3.24-04	2.63-04
16	2.15-02	8.88-03	5.16-03	3.44-03	2.46-03	1.83-03	1.41-03	1.11-03	8.87-04	7.17-04	5.84-04	4.77-04	3.85-04	2.93-04
15	2.58-02	1.07-02	6.24-03	4.17-03	3.00-03	2.25-03	1.74-03	1.37-03	1.10-03	8.86-04	7.17-04	5.75-04	4.35-04	
14	3.13-02	1.30-02	7.66-03	5.16-03	3.73-03	2.81-03	2.18-03	1.72-03	1.38-03	1.11-03	8.83-04	6.64-04		
13	3.86-02	1.62-02	9.59-03	6.50-03	4.73-03	3.58-03	2.79-03	2.21-03	1.76-03	1.39-03	1.04-03			
12	4.86-02	2.05-02	1.23-02	8.38-03	6.14-03	4.68-03	3.66-03	2.89-03	2.28-03	1.70-03				
11	6.26-02	2.67-02	1.61-02	1.11-02	8.21-03	6.31-03	4.94-03	3.87-03	2.88-03					
10	8.29-02	3.57-02	2.18-02	1.53-02	1.14-02	8.82-03	6.88-03	5.11-03						
9	1.13-01	4.95-02	3.08-02	2.19-02	1.66-02	1.29-02	9.60-03							
8	1.62-01	7.21-02	4.60-02	3.35-02	2.57-02	1.93-02								
7	2.46-01	1.12-01	7.41-02	5.56-02	4.20-02									
6	4.03-01	1.92-01	1.34-01	1.02-01										
5	7.49-01	3.84-01	2.85-01											
4	1.72+00	1.00+00												
3	6.01+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.41-06	7.04-06	5.95-06	5.07-06	4.36-06	3.77-06	3.29-06	2.88-06	2.54-06	2.25-06	2.01-06	1.79-06	1.61-06	1.45-06
45	1.07-05	8.96-06	7.58-06	6.48-06	5.57-06	4.83-06	4.22-06	3.70-06	3.27-06	2.90-06	2.58-06	2.31-06	2.07-06	1.87-06
40	1.46-05	1.23-05	1.04-05	8.93-06	7.70-06	6.69-06	5.85-06	5.15-06	4.55-06	4.04-06	3.61-06	3.23-06	2.90-06	2.62-06
35	2.17-05	1.83-05	1.56-05	1.35-05	1.16-05	1.02-05	8.91-06	7.85-06	6.95-06	6.19-06	5.52-06	4.95-06	4.44-06	4.00-06
30	3.58-05	3.05-05	2.61-05	2.25-05	1.96-05	1.71-05	1.50-05	1.32-05	1.17-05	1.04-05	9.19-06	8.11-06	7.05-06	5.79-06
29	4.02-05	3.42-05	2.93-05	2.53-05	2.20-05	1.92-05	1.69-05	1.48-05	1.31-05	1.16-05	1.02-05	8.81-06	7.20-06	
28	4.52-05	3.85-05	3.31-05	2.86-05	2.48-05	2.17-05	1.90-05	1.67-05	1.48-05	1.31-05	1.11-05	9.02-06		
27	5.12-05	4.36-05	3.74-05	3.23-05	2.81-05	2.45-05	2.14-05	1.87-05	1.63-05	1.40-05	1.14-05			
26	5.81-05	4.95-05	4.25-05	3.67-05	3.18-05	2.77-05	2.41-05	2.09-05	1.79-05	1.44-05				
25	6.63-05	5.65-05	4.85-05	4.18-05	3.61-05	3.13-05	2.70-05	2.30-05	1.85-05					
24	7.60-05	6.47-05	5.54-05	4.77-05	4.10-05	3.52-05	2.99-05	2.39-05						
23	8.75-05	7.44-05	6.36-05	5.44-05	4.65-05	3.92-05	3.12-05							
22	1.01-04	8.58-05	7.30-05	6.20-05	5.20-05	4.11-05								
21	1.17-04	9.92-05	8.37-05	6.97-05	5.49-05									
20	1.37-04	1.15-04	9.49-05	7.42-05										
19	1.59-04	1.31-04	1.02-04											
18	1.84-04	1.42-04												
17	2.02-04													

HE + TE = 5.00+03 NE = 1.00+05 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-5.30-38	-3.57-37	-1.10-36	-2.58-36	-5.13-36	-9.08-36	-1.47-35	-2.21-35	-3.12-35	-4.18-35	-5.31-35	-6.42-35	-7.34-35
45	0.00+00	-4.82-38	-3.88-37	-1.20-36	-2.79-36	-5.46-36	-9.42-36	-1.47-35	-2.10-35	-2.77-35	-3.34-35	-3.59-35	-3.20-35	-1.68-35
40	0.00+00	-3.25-38	-4.06-37	-1.28-36	-2.98-36	-5.73-36	-9.59-36	-1.43-35	-1.89-35	-2.18-35	-2.01-35	-8.99-36	1.86-35	7.34-35
35	0.00+00	9.85-38	-3.38-37	-1.16-36	-2.70-36	-5.09-36	-8.10-36	-1.09-35	-1.17-35	-7.17-36	8.49-36	4.46-35	1.16-34	2.45-34
30	0.00+00	1.50-37	-5.37-38	-4.79-37	-1.23-36	-2.15-36	-2.54-36	-7.67-37	6.48-36	2.52-35	6.60-35	1.47-34	2.97-34	5.67-34
29	0.00+00	1.91-37	4.17-38	-2.42-37	-7.09-37	-1.12-36	-6.51-37	2.56-36	1.22-35	3.50-35	8.27-35	1.76-34	3.49-34	6.60-34
28	0.00+00	2.38-37	1.53-37	3.87-38	-8.76-38	1.11-37	1.59-36	6.46-36	1.88-35	4.61-35	1.02-34	2.08-34	4.07-34	7.65-34
27	0.00+00	2.90-37	2.81-37	3.67-37	6.46-37	1.57-36	4.27-36	1.11-35	2.66-35	5.91-35	1.24-34	2.46-34	4.74-34	8.89-34
26	0.00+00	3.50-37	4.26-37	7.45-37	1.51-36	3.30-36	7.46-36	1.67-35	3.60-35	7.47-35	1.50-34	2.91-34	5.53-34	1.04-33
25	0.00+00	4.17-37	5.90-37	1.18-36	2.52-36	5.37-36	1.13-35	2.34-35	4.74-35	9.37-35	1.81-34	3.45-34	6.50-34	1.22-33
24	0.00+00	4.93-37	7.75-37	1.69-36	3.72-36	7.87-36	1.61-35	3.18-35	6.17-35	1.17-34	2.21-34	4.13-34	7.71-34	1.45-33
23	0.00+00	5.79-37	9.87-37	2.28-36	5.15-36	1.09-35	2.19-35	4.24-35	7.98-35	1.48-34	2.72-34	5.01-34	9.28-34	1.74-33
22	0.00+00	6.79-37	1.23-36	2.97-36	6.88-36	1.47-35	2.93-35	5.59-35	1.04-34	1.88-34	3.41-34	6.19-34	1.14-33	2.15-33
21	0.00+00	7.96-37	1.51-36	3.80-36	8.99-36	1.94-35	3.88-35	7.38-35	1.35-34	2.44-34	4.36-34	7.85-34	1.44-33	2.73-33
20	0.00+00	9.37-37	1.85-36	4.81-36	1.16-35	2.54-35	5.13-35	9.79-35	1.80-34	3.22-34	5.73-34	1.03-33	1.88-33	3.57-33
19	0.00+00	1.11-36	2.26-36	6.06-36	1.50-35	3.34-35	6.82-35	1.31-34	2.43-34	4.38-34	7.83-34	1.40-33	2.55-33	4.78-33
18	0.00+00	1.32-36	2.78-36	7.66-36	1.94-35	4.40-35	9.18-35	1.80-34	3.38-34	6.19-34	1.12-33	2.01-33	3.60-33	6.03-33
17	0.00+00	1.59-36	3.44-36	9.74-36	2.53-35	5.89-35	1.26-34	2.53-34	4.88-34	9.17-34	1.69-33	3.06-33	4.96-33	1.09-33
16	0.00+00	1.94-36	4.31-36	1.26-35	3.36-35	8.05-35	1.77-34	3.69-34	7.39-34	1.45-33	2.76-33	4.80-33	2.43-33	-1.63-31
15	0.00+00	2.41-36	5.49-36	1.65-35	4.55-35	1.13-34	2.60-34	5.67-34	1.20-33	2.48-33	4.87-33	5.49-33	-1.24-31	
14	0.00+00	3.04-36	7.14-36	2.22-35	6.37-35	1.66-34	4.01-34	9.34-34	2.13-33	4.78-33	8.52-33	-7.74-32		
13	0.00+00	3.91-36	9.51-36	3.09-35	9.30-35	2.56-34	6.68-34	1.71-33	4.37-33	1.05-32	-3.15-32			
12	0.00+00	5.15-36	1.31-35	4.47-35	1.44-34	4.29-34	1.24-33	3.65-33	1.11-32	7.33-33				
11	0.00+00	7.00-36	1.88-35	6.87-35	2.41-34	8.07-34	2.75-33	1.02-32	3.50-32					
10	0.00+00	9.89-36	2.84-35	1.14-34	4.54-34	1.83-33	8.28-33	4.91-32						
9	0.00+00	1.47-35	4.64-35	2.14-34	1.04-33	5.78-33	4.98-32							
8	0.00+00	2.33-35	8.47-35	4.86-34	3.38-33	4.00-32								
7	0.00+00	4.10-35	1.86-34	1.58-33	2.54-32									
6	0.00+00	8.44-35	5.73-34	1.22-32										
5	0.00+00	2.33-34	4.13-33											
4	0.00+00	1.34-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-7.86-35	-7.69-35	-6.49-35	-3.88-35	5.78-36	7.28-35	1.66-34	2.86-34	4.30-34	5.92-34	7.53-34	8.79-34	9.15-34	7.72-34
45	1.62-35	7.62-35	1.75-34	3.28-34	5.56-34	8.83-34	1.34-33	1.97-33	2.81-33	3.93-33	5.38-33	7.25-33	9.63-33	1.26-32
40	1.71-34	3.33-34	5.90-34	9.85-34	1.58-33	2.45-33	3.73-33	5.57-33	8.21-33	1.20-32	1.74-32	2.51-32	3.64-32	5.29-32
35	4.66-34	8.33-34	1.43-33	2.37-33	3.84-33	6.14-33	9.73-33	1.54-32	2.43-32	3.86-32	6.23-32	1.03-31	1.74-31	3.10-31
30	1.04-33	1.85-33	3.24-33	5.62-33	9.71-33	1.69-32	2.99-32	5.42-32	1.02-31	2.07-31	4.62-31	1.22-30	4.42-30	3.49-29
29	1.21-33	2.17-33	3.84-33	6.77-33	1.20-32	2.15-32	3.95-32	7.56-32	1.54-31	3.47-31	9.24-31	3.37-30	2.66-29	
28	1.41-33	2.54-33	4.57-33	8.23-33	1.50-32	2.79-32	5.41-32	1.11-31	2.53-31	6.77-31	2.48-30	1.96-29		
27	1.64-33	3.00-33	5.50-33	1.02-32	1.92-32	3.76-32	7.81-32	1.79-31	4.80-31	1.76-30	1.39-29			
26	1.92-33	3.58-33	6.70-33	1.28-32	2.54-32	5.32-32	1.22-31	3.30-31	1.21-30	9.51-30				
25	2.28-33	4.32-33	8.34-33	1.66-32	3.51-32	8.12-32	2.20-31	8.03-31	6.25-30					
24	2.74-33	5.31-33	1.06-32	2.25-32	5.21-32	1.40-31	5.09-31	3.91-30						
23	3.36-33	6.69-33	1.41-32	3.24-32	8.63-32	3.07-31	2.29-30							
22	4.21-33	8.71-33	1.96-32	5.09-32	1.74-31	1.23-30								
21	5.44-33	1.17-32	2.88-32	9.08-32	5.57-31									
20	7.20-33	1.60-32	4.18-32	1.59-31										
19	9.16-33	1.58-32	-5.60-32											
18	4.15-33	-1.54-31												
17	-1.79-31													

HE + TE = 5.00+03 NE = 1.00+06 CASE B NC = 70

TOTAL RC = 2.656-12 4-3 RC = 6.702-13 4-3 EM = 2.840-24 2S RC = 6.712-13 2P RC = 1.985-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.86-03	1.80-03	7.74-04	4.01-04	2.34-04	1.49-04	1.00-04	7.05-05	5.16-05	3.89-05	3.00-05	2.37-05	1.90-05	1.55-05
45	6.85-03	2.11-03	9.07-04	4.71-04	2.75-04	1.74-04	1.18-04	8.30-05	6.07-05	4.58-05	3.54-05	2.79-05	2.24-05	1.82-05
40	8.02-03	2.47-03	1.07-03	5.54-04	3.24-04	2.06-04	1.39-04	9.83-05	7.20-05	5.43-05	4.20-05	3.32-05	2.66-05	2.17-05
35	9.85-03	3.05-03	1.32-03	6.91-04	4.06-04	2.59-04	1.75-04	1.24-04	9.13-05	6.91-05	5.35-05	4.23-05	3.40-05	2.78-05
30	1.28-02	4.01-03	1.76-03	9.33-04	5.55-04	3.57-04	2.44-04	1.74-04	1.29-04	9.80-05	7.64-05	6.07-05	4.90-05	4.02-05
29	1.35-02	4.25-03	1.88-03	9.98-04	5.96-04	3.85-04	2.64-04	1.89-04	1.40-04	1.07-04	8.33-05	6 63-05	5.36-05	4.40-05
28	1.42-02	4.50-03	2.00-03	1.07-03	6.42-04	4.16-04	2.86-04	2.06-04	1.53-04	1.17-04	9.13-05	7.28-05	5.90-05	4.85-05
27	1.49-02	4.77-03	2.14-03	1.15-03	6.93-04	4.52-04	3.12-04	2.25-04	1.68-04	1.29-04	1.01-04	8.06-05	6.54-05	5.38-05
26	1.56-02	5.05-03	2.28-03	1.24-03	7.52-04	4.93-04	3.42-04	2.48-04	1.85-04	1.43-04	1.12-04	8.98-05	7.30-05	6.02-05
25	1.63-02	5.34-03	2.44-03	1.34-03	8.20-04	5.41-04	3.78-04	2.75-04	2.06-04	1.59-04	1.26-04	1.01-04	8.22-05	6.79-05
24	1.69-02	5.64-03	2.62-03	1.45-03	8.98-04	5.98-04	4.20-04	3.07-04	2.32-04	1.80-04	1.42-04	1.14-04	9.34-05	7.73-05
23	1.75-02	5.97-03	2.82-03	1.58-03	9.90-04	6.65-04	4.70-04	3.46-04	2.62-04	2.04-04	1.62-04	1.31-04	1.07-04	8.88-05
22	1.81-02	6.31-03	3.04-03	1.74-03	1.10-03	7.45-04	5.31-04	3.93-04	3.00-04	2.34-04	1.87-04	1.51-04	1.24-04	1.03-04
21	1.88-02	6.71-03	3.31-03	1.92-03	1.23-03	8.44-04	6.07-04	4.52-04	3.46-04	2.72-04	2.17-04	1.76-04	1.45-04	1.20-04
20	1.95-02	7.18-03	3.63-03	2.14-03	1.39-03	9.65-04	6.99-04	5.25-04	4.04-04	3.18-04	2.55-04	2.07-04	1.71-04	1.42-04
19	2.05-02	7.74-03	4.01-03	2.42-03	1.59-03	1.12-03	8.16-04	6.16-04	4.77-04	3.77-04	3.02-04	2.46-04	2.02-04	1.68-04
18	2.16-02	8.45-03	4.49-03	2.76-03	1.85-03	1.31-03	9.62-04	7.31-04	5.68-04	4.50-04	3.62-04	2.95-04	2.42-04	1.99-04
17	2.37-02	9.38-03	5.11-03	3.20-03	2.17-03	1.55-03	1.15-03	8.78-04	6.85-04	5.44-04	4.38-04	3.55-04	2.90-04	2.34-04
16	2.65-02	1.06-02	5.90-03	3.76-03	2.58-03	1.86-03	1.39-03	1.07-03	8.36-04	6.64-04	5.34-04	4.31-04	3.45-04	2.62-04
15	3.03-02	1.23-02	6.95-03	4.49-03	3.12-03	2.27-03	1.71-03	1.32-03	1.03-03	8.21-04	6.55-04	5.20-04	3.91-04	
14	3.56-02	1.46-02	8.36-03	5.48-03	3.85-03	2.82-03	2.14-03	1.65-03	1.30-03	1.02-03	8.04-04	6.00-04		
13	4.30-02	1.78-02	1.03-02	6.83-03	4.84-03	3.58-03	2.72-03	2.11-03	1.65-03	1.28-03	9.47-04			
12	5.32-02	2.22-02	1.30-02	8.73-03	6.25-03	4.65-03	3.55-03	2.74-03	2.11-03	1.55-03				
11	6.79-02	2.86-02	1.70-02	1.15-02	8.30-03	6.22-03	4.75-03	3.63-03	2.64-03					
10	8.92-02	3.80-02	2.29-02	1.57-02	1.14-02	8.60-03	6.51-03	4.71-03						
9	1.22-01	5.26-02	3.22-02	2.24-02	1.65-02	1.24-02	8.90-03							
8	1.74-01	7.64-02	4.77-02	3.38-02	2.51-02	1.80-02								
7	2.62-01	1.18-01	7.63-02	5.51-02	3.98-02									
6	4.30-01	2.02-01	1.36-01	9.79-02										
5	7.98-01	3.98-01	2.79-01											
4	1.82+00	1.00+00												
3	6.19+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.28-05	1.06-05	8.98-06	7.64-06	6.56-06	5.67-06	4.93-06	4.32-06	3.80-06	3.36-06	2.99-06	2.67-06	2.39-06	2.16-06
45	1.50-05	1.26-05	1.06-05	9.02-06	7.74-06	6.69-06	5.82-06	5.10-06	4.49-06	3.97-06	3.53-06	3.15-06	2.83-06	2.54-06
40	1.79-05	1.50-05	1.26-05	1.08-05	9.24-06	7.99-06	6.95-06	6.09-06	5.36-06	4.74-06	4.22-06	3.76-06	3.37-06	3.03-06
35	2.30-05	1.92-05	1.62-05	1.38-05	1.19-05	1.03-05	8.97-06	7.85-06	6.92-06	6.12-06	5.44-06	4.85-06	4.33-06	3.88-06
30	3.34-05	2.80-05	2.37-05	2.03-05	1.74-05	1.51-05	1.32-05	1.15-05	1.01-05	8.93-06	7.88-06	6.93-06	6.02-06	4.94-06
29	3.66-05	3.07-05	2.60-05	2.23-05	1.92-05	1.66-05	1.45-05	1.27-05	1.11-05	9.77-06	8.56-06	7.41-06	6.07-06	
28	4.03-05	3.39-05	2.88-05	2.46-05	2.12-05	1.84-05	1.60-05	1.40-05	1.22-05	1.07-05	9.22-06	7.53-06		
27	4.48-05	3.77-05	3.21-05	2.74-05	2.36-05	2.05-05	1.78-05	1.55-05	1.35-05	1.16-05	9.44-06			
26	5.02-05	4.23-05	3.60-05	3.08-05	2.65-05	2.30-05	1.99-05	1.73-05	1.48-05	1.20-05				
25	5.68-05	4.79-05	4.07-05	3.49-05	3.00-05	2.59-05	2.23-05	1.90-05	1.54-05					
24	6.47-05	5.46-05	4.64-05	3.97-05	3.41-05	2.93-05	2.48-05	1.99-05						
23	7.44-05	6.28-05	5.34-05	4.55-05	3.89-05	3.28-05	2.62-05							
22	8.62-05	7.27-05	6.17-05	5.23-05	4.39-05	3.49-05								
21	1.01-04	8.47-05	7.14-05	5.95-05	4.70-05									
20	1.18-04	9.88-05	8.19-05	6.43-05										
19	1.39-04	1.14-04	8.90-05											
18	1.62-04	1.25-04												
17	1.79-04													

HE + TE = 5.00+03 NE = 1.00+06 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.33-37	-7.10-37	-2.21-36	-5.42-36	-1.14-35	-2.18-35	-3.84-35	-6.39-35	-1.02-34	-1.56-34	-2.33-34	-3.41-34	-4.90-34
45	0.00+00	-1.37-37	-7.80-37	-2.43-36	-5.93-36	-1.24-35	-2.34-35	-4.09-35	-6.74-35	-1.06-34	-1.62-34	-2.40-34	-3.49-34	-5.02-34
40	0.00+00	-1.28-37	-8.25-37	-2.58-36	-6.22-36	-1.28-35	-2.37-35	-4.05-35	-6.50-35	-9.98-35	-1.48-34	-2.14-34	-3.04-34	-4.28-34
35	0.00+00	-1.08-37	-8.85-37	-2.79-36	-6.64-36	-1.34-35	-2.40-35	-3.93-35	-6.00-35	-8.66-35	-1.19-34	-1.57-34	-1.99-34	-2.49-34
30	0.00+00	-5.91-38	-9.42-37	-3.05-36	-7.20-36	-1.41-35	-2.42-35	-3.71-35	-5.11-35	-6.19-35	-6.20-35	-3.79-35	3.13-35	1.78-34
29	0.00+00	-3.85-38	-9.34-37	-3.06-36	-7.22-36	-1.41-35	-2.38-35	-3.57-35	-4.72-35	-5.25-35	-4.10-35	5.60-36	1.17-34	3.42-34
28	0.00+00	-1.12-38	-9.10-37	-3.04-36	-7.16-36	-1.39-35	-2.31-35	-3.37-35	-4.19-35	-4.02-35	-1.43-35	6.10-35	2.28-34	5.56-34
27	0.00+00	2.47-38	-8.66-37	-2.96-36	-6.99-36	-1.34-35	-2.19-35	-3.07-35	-3.48-35	-2.43-35	1.99-35	1.32-34	3.71-34	8.38-34
26	0.00+00	7.14-38	-7.95-37	-2.81-36	-6.66-36	-1.26-35	-2.01-35	-2.65-35	-2.55-35	-3.81-36	6.37-35	2.23-34	5.57-34	1.21-33
25	0.00+00	1.32-37	-6.89-37	-2.58-36	-6.13-36	-1.15-35	-1.76-35	-2.09-35	-1.33-35	2.25-35	1.20-34	3.40-34	8.01-34	1.72-33
24	0.00+00	2.09-37	-5.39-37	-2.23-36	-5.35-36	-9.81-36	-1.41-35	-1.35-35	2.43-36	5.58-35	1.91-34	4.91-34	1.12-33	2.41-33
23	0.00+00	3.07-37	-3.34-37	-1.74-36	-4.27-36	-7.51-36	-9.33-36	-3.82-36	2.25-35	9.81-35	2.81-34	6.88-34	1.55-33	3.37-33
22	0.00+00	4.29-37	-6.53-38	-1.09-36	-2.79-36	-4.44-36	-3.12-36	8.65-36	4.80-35	1.52-34	3.97-34	9.46-34	2.14-33	4.76-33
21	0.00+00	5.79-37	2.77-37	-2.32-37	-8.61-37	-3.93-37	4.98-36	2.48-35	8.07-35	2.21-34	5.49-34	1.30-33	2.98-33	6.88-33
20	0.00+00	7.61-37	7.02-37	8.54-37	1.64-36	4.89-36	1.56-35	4.59-35	1.24-34	3.12-34	7.54-34	1.79-33	4.24-33	1.04-32
19	0.00+00	9.80-37	1.23-36	2.23-36	4.89-36	1.18-35	2.97-35	7.40-35	1.81-34	4.35-34	1.04-33	2.51-33	6.23-33	1.66-32
18	0.00+00	1.24-36	1.87-36	3.98-36	9.12-36	2.11-35	4.88-35	1.13-34	2.61-34	6.12-34	1.46-33	3.65-33	9.75-33	2.98-32
17	0.00+00	1.56-36	2.65-36	6.19-36	1.47-35	3.38-35	7.59-35	1.69-34	3.81-34	8.83-34	2.15-33	5.65-33	1.70-32	6.62-32
16	0.00+00	1.95-36	3.63-36	9.09-36	2.23-35	5.19-35	1.16-34	2.56-34	5.73-34	1.34-33	3.36-33	9.60-33	3.50-32	2.37-31
15	0.00+00	2.45-36	4.88-36	1.30-35	3.31-35	7.88-35	1.79-34	4.00-34	9.17-34	2.17-33	5.79-33	1.88-32	9.35-32	
14	0.00+00	3.11-36	6.55-36	1.84-35	4.91-35	1.21-34	2.85-34	6.61-34	1.56-33	3.95-33	1.13-32	2.93-32		
13	0.00+00	4.00-36	8.89-36	2.64-35	7.43-35	1.94-34	4.83-34	1.20-33	3.07-33	8.36-33	9.56-33			
12	0.00+00	5.27-36	1.23-35	3.90-35	1.17-34	3.29-34	8.99-34	2.50-33	7.37-33	1.13-32				
11	0.00+00	7.15-36	1.78-35	6.04-35	1.98-34	6.21-34	1.97-33	6.72-33	2.05-32					
10	0.00+00	1.01-35	2.69-35	1.01-34	3.74-34	1.39-33	5.72-33	2.88-32						
9	0.00+00	1.50-35	4.39-35	1.88-34	8.47-34	4.28-33	3.16-32							
8	0.00+00	2.38-35	7.99-35	4.24-34	2.69-33	2.78-32								
7	0.00+00	4.16-35	1.74-34	1.35-33	1.93-32									
6	0.00+00	8.55-35	5.31-34	1.01-32										
5	0.00+00	2.35-34	3.73-33											
4	0.00+00	1.33-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-6.97-34	-9.81-34	-1.37-33	-1.91-33	-2.65-33	-3.66-33	-5.04-33	-6.91-33	-9.45-33	-1.29-32	-1.75-32	-2.37-32	-3.21-32	-4.35-32
45	-7.14-34	-1.01-33	-1.43-33	-2.03-33	-2.87-33	-4.06-33	-5.74-33	-8.12-33	-1.15-32	-1.62-32	-2.29-32	-3.25-32	-4.60-32	-6.55-32
40	-6.01-34	-8.49-34	-1.21-33	-1.74-33	-2.54-33	-3.75-33	-5.57-33	-8.34-33	-1.25-32	-1.89-32	-2.88-32	-4.40-32	-6.78-32	-1.06-31
35	-3.08-34	-3.89-34	-5.14-34	-7.33-34	-1.13-33	-1.87-33	-3.24-33	-5.74-33	-1.03-32	-1.86-32	-3.38-32	-6.27-32	-1.20-31	-2.39-31
30	4.51-34	9.21-34	1.69-33	2.91-33	4.80-33	7.69-33	1.21-32	1.86-32	2.86-32	4.35-32	6.45-32	8.03-32	-5.42-32	-3.44-30
29	7.56-34	1.48-33	2.69-33	4.69-33	7.98-33	1.34-32	2.25-32	3.85-32	6.81-32	1.29-31	2.76-31	7.52-31	3.80-30	
28	1.16-33	2.23-33	4.10-33	7.31-33	1.29-32	2.29-32	4.14-32	7.82-32	1.61-31	3.83-31	1.22-30	8.26-30		
27	1.71-33	3.29-33	6.13-33	1.13-32	2.08-32	3.90-32	7.80-32	1.68-31	4.23-31	1.44-30	1.06-29			
26	2.46-33	4.79-33	9.17-33	1.76-32	3.45-32	7.08-32	1.58-31	4.14-31	1.47-30	1.12-29				
25	3.50-33	6.98-33	1.39-32	2.81-32	5.97-32	1.38-31	3.72-31	1.36-30	1.07-29					
24	5.00-33	1.03-32	2.16-32	4.72-32	1.12-31	3.11-31	1.17-30	9.40-30						
23	7.21-33	1.56-32	3.52-32	8.58-32	2.44-31	9.35-31	7.68-30							
22	1.07-32	2.47-32	6.19-32	1.79-31	7.00-31	5.84-30								
21	1.64-32	4.21-32	1.25-31	4.94-31	4.14-30									
20	2.71-32	8.18-32	3.28-31	2.76-30										
19	5.07-32	2.04-31	1.71-30											
18	1.20-31	9.73-31												
17	5.10-31													

HE + TE = 5.00+03 NE = 1.00+07 CASE B NC = 54

TOTAL RC = 2.766-12 4-3 RC = 6.524-13 4-3 EM = 2.765-24 2S RC = 7.189-13 2P RC = 2.047-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.84-03	2.41-03	1.03-03	5.36-04	3.13-04	1.98-04	1.33-04	9.40-05	6.87-05	5.17-05	3.99-05	3.15-05	2.52-05	2.05-05
45	1.02-02	3.14-03	1.35-03	6.99-04	4.08-04	2.58-04	1.74-04	1.22-04	8.96-05	6.74-05	5.20-05	4.10-05	3.29-05	2.68-05
40	1.32-02	4.04-03	1.74-03	9.01-04	5.26-04	3.33-04	2.24-04	1.58-04	1.16-04	8.70-05	6.72-05	5.29-05	4.24-05	3.45-05
35	1.64-02	5.03-03	2.16-03	1.12-03	6.55-04	4.15-04	2.80-04	1.97-04	1.44-04	1.09-04	8.39-05	6.61-05	5.30-05	4.31-05
30	1.97-02	6.07-03	2.62-03	1.36-03	7.95-04	5.05-04	3.40-04	2.40-04	1.76-04	1.33-04	1.02-04	8.08-05	6.48-05	5.28-05
29	2.06-02	6.34-03	2.73-03	1.42-03	8.31-04	5.28-04	3.56-04	2.52-04	1.84-04	1.39-04	1.07-04	8.47-05	6.79-05	5.53-05
28	2.15-02	6.64-03	2.87-03	1.49-03	8.74-04	5.55-04	3.75-04	2.65-04	1.94-04	1.46-04	1.13-04	8.93-05	7.17-05	5.84-05
27	2.27-02	7.00-03	3.03-03	1.58-03	9.24-04	5.88-04	3.97-04	2.81-04	2.06-04	1.55-04	1.20-04	9.49-05	7.62-05	6.20-05
26	2.40-02	7.42-03	3.21-03	1.68-03	9.84-04	6.27-04	4.24-04	3.00-04	2.20-04	1.66-04	1.29-04	1.02-04	8.16-05	6.65-05
25	2.55-02	7.91-03	3.43-03	1.79-03	1.06-03	6.73-04	4.56-04	3.23-04	2.37-04	1.79-04	1.39-04	1.10-04	8.82-05	7.19-05
24	2.73-02	8.48-03	3.69-03	1.93-03	1.14-03	7.28-04	4.94-04	3.51-04	2.58-04	1.95-04	1.51-04	1.20-04	9.62-05	7.85-05
23	2.93-02	9.13-03	3.99-03	2.10-03	1.24-03	7.94-04	5.40-04	3.84-04	2.83-04	2.14-04	1.66-04	1.32-04	1.06-04	8.65-05
22	3.14-02	9.86-03	4.33-03	2.28-03	1.36-03	8.72-04	5.94-04	4.24-04	3.13-04	2.38-04	1.85-04	1.46-04	1.18-04	9.64-05
21	3.38-02	1.07-02	4.71-03	2.50-03	1.49-03	9.65-04	6.60-04	4.72-04	3.50-04	2.66-04	2.08-04	1.65-04	1.33-04	1.09-04
20	3.63-02	1.16-02	5.16-03	2.76-03	1.66-03	1.08-03	7.41-04	5.32-04	3.96-04	3.02-04	2.36-04	1.88-04	1.52-04	1.24-04
19	3.90-02	1.26-02	5.67-03	3.06-03	1.86-03	1.21-03	8.41-04	6.07-04	4.53-04	3.47-04	2.72-04	2.17-04	1.75-04	1.43-04
18	4.16-02	1.37-02	6.26-03	3.43-03	2.10-03	1.39-03	9.67-04	7.02-04	5.27-04	4.06-04	3.19-04	2.55-04	2.06-04	1.67-04
17	4.43-02	1.49-02	6.95-03	3.87-03	2.40-03	1.60-03	1.13-03	8.26-04	6.24-04	4.82-04	3.80-04	3.04-04	2.45-04	1.96-04
16	4.71-02	1.63-02	7.80-03	4.43-03	2.80-03	1.89-03	1.34-03	9.90-04	7.52-04	5.83-04	4.60-04	3.67-04	2.92-04	2.21-04
15	5.02-02	1.80-02	8.87-03	5.16-03	3.31-03	2.27-03	1.63-03	1.21-03	9.24-04	7.19-04	5.66-04	4.45-04	3.34-04	
14	5.41-02	2.01-02	1.03-02	6.14-03	4.01-03	2.79-03	2.02-03	1.51-03	1.16-03	8.98-04	6.98-04	5.18-04		
13	5.99-02	2.31-02	1.22-02	7.48-03	4.98-03	3.51-03	2.56-03	1.93-03	1.47-03	1.13-03	8.27-04			
12	6.86-02	2.72-02	1.49-02	9.36-03	6.35-03	4.52-03	3.33-03	2.50-03	1.89-03	1.37-03				
11	8.24-02	3.34-02	1.89-02	1.21-02	8.35-03	6.01-03	4.43-03	3.30-03	2.35-03					
10	1.04-01	4.30-02	2.48-02	1.63-02	1.14-02	8.23-03	6.02-03	4.24-03						
9	1.38-01	5.81-02	3.43-02	2.29-02	1.61-02	1.16-02	8.09-03							
8	1.94-01	8.32-02	5.02-02	3.40-02	2.41-02	1.66-02								
7	2.90-01	1.28-01	7.90-02	5.43-02	3.70-02									
6	4.73-01	2.15-01	1.37-01	9.28-02										
5	8.73-01	4.16-01	2.71-01											
4	1.97+00	1.00+00												
3	6.48+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.69-05	1.41-05	1.19-05	1.01-05	8.69-06	7.51-06	6.53-06	5.72-06	5.03-06	4.45-06	3.96-06	3.53-06	3.17-06	2.85-06
45	2.21-05	1.84-05	1.55-05	1.32-05	1.13-05	9.78-06	8.51-06	7.44-06	6.55-06	5.79-06	5.15-06	4.59-06	4.12-06	3.70-06
40	2.85-05	2.38-05	2.00-05	1.70-05	1.46-05	1.26-05	1.10-05	9.59-06	8.44-06	7.46-06	6.62-06	5.91-06	5.29-06	4.75-06
35	3.56-05	2.97-05	2.50-05	2.13-05	1.82-05	1.57-05	1.37-05	1.20-05	1.05-05	9.28-06	8.23-06	7.32-06	6.54-06	5.85-06
30	4.35-05	3.63-05	3.06-05	2.60-05	2.23-05	1.92-05	1.67-05	1.45-05	1.27-05	1.12-05	9.84-06	8.63-06	7.47-06	6.11-06
29	4.56-05	3.81-05	3.21-05	2.73-05	2.34-05	2.01-05	1.75-05	1.52-05	1.33-05	1.16-05	1.02-05	8.77-06	7.15-06	
28	4.82-05	4.02-05	3.39-05	2.88-05	2.46-05	2.12-05	1.84-05	1.60-05	1.39-05	1.21-05	1.04-05	8.45-06		
27	5.12-05	4.27-05	3.60-05	3.06-05	2.62-05	2.25-05	1.95-05	1.69-05	1.46-05	1.25-05	1.01-05			
26	5.49-05	4.58-05	3.86-05	3.27-05	2.80-05	2.41-05	2.07-05	1.78-05	1.52-05	1.22-05				
25	5.94-05	4.95-05	4.17-05	3.54-05	3.02-05	2.59-05	2.21-05	1.88-05	1.50-05					
24	6.48-05	5.41-05	4.55-05	3.85-05	3.28-05	2.79-05	2.35-05	1.88-05						
23	7.14-05	5.96-05	5.01-05	4.23-05	3.58-05	3.00-05	2.38-05							
22	7.96-05	6.64-05	5.56-05	4.68-05	3.89-05	3.08-05								
21	8.97-05	7.46-05	6.22-05	5.15-05	4.05-05									
20	1.02-04	8.46-05	6.95-05	5.43-05										
19	1.18-04	9.60-05	7.85-05											
18	1.36-04	1.05-04												
17	1.50-04													

HE + TE = 5.00+03 NE = 1.00+07 CASE B NC = 54

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.97-37	-1.00-36	-3.15-36	-7.84-36	-1.69-35	-3.29-35	-5.94-35	-1.01-34	-1.65-34	-2.61-34	-4.00-34	-6.01-34	-8.87-34
45	0.00+00	-2.50-37	-1.30-36	-4.08-36	-1.02-35	-2.20-35	-4.30-35	-7.79-35	-1.34-34	-2.20-34	-3.49-34	-5.41-34	-8.22-34	-1.23-33
40	0.00+00	-3.06-37	-1.63-36	-5.16-36	-1.29-35	-2.80-35	-5.48-35	-9.98-35	-1.72-34	-2.85-34	-4.56-34	-7.20-34	-1.11-33	-1.69-33
35	0.00+00	-3.34-37	-1.92-36	-6.09-36	-1.53-35	-3.31-35	-6.48-35	-1.18-34	-2.05-34	-3.42-34	-5.55-34	-8.87-34	-1.40-33	-2.18-33
30	0.00+00	-2.93-37	-2.03-36	-6.53-36	-1.63-35	-3.49-35	-6.76-35	-1.22-34	-2.10-34	-3.50-34	-5.73-34	-9.31-34	-1.51-33	-2.46-33
29	0.00+00	-2.76-37	-2.04-36	-6.59-36	-1.64-35	-3.50-35	-6.75-35	-1.21-34	-2.08-34	-3.45-34	-5.65-34	-9.20-34	-1.50-33	-2.47-33
28	0.00+00	-2.57-37	-2.05-36	-6.66-36	-1.65-35	-3.51-35	-6.74-35	-1.20-34	-2.05-34	-3.39-34	-5.53-34	-9.02-34	-1.48-33	-2.47-33
27	0.00+00	-2.35-37	-2.07-36	-6.76-36	-1.67-35	-3.54-35	-6.74-35	-1.19-34	-2.02-34	-3.31-34	-5.38-34	-8.78-34	-1.45-33	-2.46-33
26	0.00+00	-2.10-37	-2.09-36	-6.87-36	-1.70-35	-3.57-35	-6.75-35	-1.19-34	-1.98-34	-3.22-34	-5.19-34	-8.45-34	-1.41-33	-2.41-33
25	0.00+00	-1.80-37	-2.12-36	-7.01-36	-1.73-35	-3.62-35	-6.78-35	-1.18-34	-1.94-34	-3.10-34	-4.93-34	-7.97-34	-1.33-33	-2.32-33
24	0.00+00	-1.42-37	-2.14-36	-7.15-36	-1.76-35	-3.66-35	-6.80-35	-1.16-34	-1.88-34	-2.94-34	-4.56-34	-7.24-34	-1.20-33	-2.14-33
23	0.00+00	-9.26-38	-2.15-36	-7.28-36	-1.79-35	-3.70-35	-6.79-35	-1.14-34	-1.79-34	-2.70-34	-4.00-34	-6.07-34	-9.84-34	-1.77-33
22	0.00+00	-2.68-38	-2.14-36	-7.37-36	-1.81-35	-3.71-35	-6.70-35	-1.10-34	-1.65-34	-2.31-34	-3.09-34	-4.11-34	-5.87-34	-1.02-33
21	0.00+00	6.32-38	-2.08-36	-7.34-36	-1.81-35	-3.67-35	-6.48-35	-1.02-34	-1.42-34	-1.71-34	-1.62-34	-7.60-35	1.47-34	5.47-34
20	0.00+00	1.88-37	-1.94-36	-7.15-36	-1.76-35	-3.54-35	-6.04-35	-8.84-35	-1.04-34	-7.25-35	8.22-35	5.13-34	1.56-33	3.95-33
19	0.00+00	3.61-37	-1.70-36	-6.67-36	-1.65-35	-3.25-35	-5.26-35	-6.64-35	-4.41-35	8.68-35	4.97-34	1.59-33	4.41-33	1.20-32
18	0.00+00	6.02-37	-1.29-36	-5.77-36	-1.45-35	-2.74-35	-3.93-35	-3.10-35	5.19-35	3.49-34	1.22-33	3.66-33	1.08-32	3.46-32
17	0.00+00	9.33-37	-6.50-37	-4.27-36	-1.09-35	-1.89-35	-1.81-35	2.50-35	2.07-34	7.96-34	2.57-33	8.08-33	2.76-32	1.21-31
16	0.00+00	1.39-36	3.03-37	-1.91-36	-5.24-36	-5.39-36	1.53-35	1.14-34	4.62-34	1.59-33	5.30-33	1.90-32	8.75-32	8.19-31
15	0.00+00	2.00-36	1.67-36	1.61-36	3.45-36	1.56-35	6.80-35	2.58-34	9.04-34	3.13-33	1.17-32	5.57-32	5.32-31	
14	0.00+00	2.81-36	3.58-36	6.78-36	1.67-35	4.89-35	1.55-34	5.09-34	1.75-33	6.65-33	3.21-32	3.04-31		
13	0.00+00	3.89-36	6.22-36	1.44-35	3.76-35	1.04-34	3.09-34	9.95-34	3.66-33	1.73-32	1.57-31			
12	0.00+00	5.35-36	9.97-36	2.61-35	7.24-35	2.05-34	6.17-34	2.11-33	9.27-33	7.42-32				
11	0.00+00	7.41-36	1.55-35	4.54-35	1.36-34	4.15-34	1.37-33	5.58-33	3.73-32					
10	0.00+00	1.05-35	2.45-35	8.04-35	2.72-34	9.54-34	3.91-33	2.40-32						
9	0.00+00	1.56-35	4.05-35	1.54-34	6.26-34	2.90-33	2.02-32							
8	0.00+00	2.47-35	7.39-35	3.48-34	1.97-33	1.78-32								
7	0.00+00	4.31-35	1.60-34	1.09-33	1.35-32									
6	0.00+00	8.80-35	4.78-34	7.81-33										
5	0.00+00	2.40-34	3.24-33											
4	0.00+00	1.33-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.29-33	-1.84-33	-2.59-33	-3.61-33	-4.97-33	-6.79-33	-9.18-33	-1.23-32	-1.64-32	-2.17-32	-2.86-32	-3.73-32	-4.85-32	-6.26-32
45	-1.81-33	-2.62-33	-3.76-33	-5.34-33	-7.50-33	-1.05-32	-1.45-32	-2.00-32	-2.74-32	-3.75-32	-5.10-32	-6.93-32	-9.38-32	-1.27-31
40	-2.53-33	-3.76-33	-5.53-33	-8.08-33	-1.17-32	-1.69-32	-2.44-32	-3.50-32	-5.04-32	-7.25-32	-1.05-31	-1.52-31	-2.21-31	-3.26-31
35	-3.38-33	-5.21-33	-7.99-33	-1.22-32	-1.87-32	-2.86-32	-4.40-32	-6.82-32	-1.07-31	-1.70-31	-2.76-31	-4.61-31	-7.96-31	-1.44-30
30	-4.03-33	-6.62-33	-1.10-32	-1.83-32	-3.10-32	-5.35-32	-9.47-32	-1.74-31	-3.37-31	-7.01-31	-1.63-30	-4.53-30	-1.74-29	-1.48-28
29	-4.11-33	-6.90-33	-1.17-32	-2.01-32	-3.51-32	-6.31-32	-1.17-31	-2.30-31	-4.84-31	-1.14-30	-3.21-30	-1.25-29	-1.08-28	
28	-4.18-33	-7.19-33	-1.25-32	-2.23-32	-4.06-32	-7.66-32	-1.52-31	-3.24-31	-7.73-31	-2.20-30	-8.71-30	-7.62-29		
27	-4.25-33	-7.50-33	-1.35-32	-2.51-32	-4.82-32	-9.71-32	-2.10-31	-5.07-31	-1.46-30	-5.86-30	-5.20-29			
26	-4.28-33	-7.83-33	-1.48-32	-2.89-32	-5.94-32	-1.31-31	-3.21-31	-9.40-31	-3.81-30	-3.43-29				
25	-4.26-33	-8.14-33	-1.63-32	-3.42-32	-7.73-32	-1.94-31	-5.78-31	-2.39-30	-2.18-29					
24	-4.08-33	-8.30-33	-1.80-32	-4.19-32	-1.08-31	-3.33-31	-1.41-30	-1.31-29						
23	-3.57-33	-7.96-33	-1.94-32	-5.31-32	-1.71-31	-7.56-31	-7.31-30							
22	-2.26-33	-6.10-33	-1.88-32	-6.81-32	-3.32-31	-3.47-30								
21	9.94-34	4.90-34	-7.04-33	-7.05-32	-1.04-30									
20	9.56-33	2.43-32	7.37-32	3.72-31										
19	3.56-32	1.35-31	1.05-30											
18	1.43-31	1.21-30												
17	1.09-30													

HE + TE = 5.00+03 NE = 1.00+08 CASE B NC = 34

TOTAL RC = 2.977-12 4-3 RC = 6.388-13 4-3 EM = 2.707-24 2S RC = 8.029-13 2P RC = 2.174-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.61-03	2.64-03	1.13-03	5.88-04	3.43-04	2.17-04	1.46-04	1.03-04	7.53-05	5.67-05	4.38-05	3.45-05	2.76-05	2.25-05
45	1.18-02	3.61-03	1.55-03	8.05-04	4.69-04	2.97-04	2.00-04	1.41-04	1.03-04	7.76-05	5.99-05	4.72-05	3.78-05	3.08-05
40	1.66-02	5.09-03	2.19-03	1.13-03	6.60-04	4.18-04	2.81-04	1.98-04	1.45-04	1.09-04	8.42-05	6.63-05	5.31-05	4.32-05
35	2.38-02	7.31-03	3.14-03	1.63-03	9.49-04	6.01-04	4.04-04	2.85-04	2.08-04	1.57-04	1.21-04	9.51-05	7.62-05	6.20-05
30	3.36-02	1.03-02	4.44-03	2.30-03	1.34-03	8.49-04	5.71-04	4.02-04	2.94-04	2.21-04	1.71-04	1.34-04	1.08-04	8.75-05
29	3.58-02	1.10-02	4.73-03	2.45-03	1.43-03	9.04-04	6.08-04	4.29-04	3.13-04	2.36-04	1.82-04	1.43-04	1.15-04	9.32-05
28	3.80-02	1.17-02	5.01-03	2.60-03	1.52-03	9.60-04	6.46-04	4.55-04	3.32-04	2.50-04	1.93-04	1.52-04	1.22-04	9.89-05
27	4.01-02	1.23-02	5.30-03	2.74-03	1.60-03	1.01-03	6.82-04	4.81-04	3.51-04	2.64-04	2.04-04	1.60-04	1.29-04	1.04-04
26	4.22-02	1.29-02	5.57-03	2.89-03	1.68-03	1.07-03	7.18-04	5.06-04	3.70-04	2.78-04	2.14-04	1.69-04	1.35-04	1.10-04
25	4.41-02	1.35-02	5.83-03	3.02-03	1.76-03	1.12-03	7.52-04	5.30-04	3.87-04	2.91-04	2.25-04	1.77-04	1.42-04	1.15-04
24	4.60-02	1.41-02	6.08-03	3.15-03	1.84-03	1.17-03	7.85-04	5.53-04	4.05-04	3.04-04	2.35-04	1.85-04	1.48-04	1.20-04
23	4.79-02	1.47-02	6.34-03	3.29-03	1.92-03	1.22-03	8.20-04	5.78-04	4.23-04	3.18-04	2.46-04	1.93-04	1.54-04	1.25-04
22	5.01-02	1.54-02	6.63-03	3.44-03	2.01-03	1.28-03	8.60-04	6.06-04	4.43-04	3.34-04	2.57-04	2.02-04	1.62-04	1.31-04
21	5.26-02	1.62-02	6.99-03	3.63-03	2.12-03	1.35-03	9.08-04	6.41-04	4.68-04	3.53-04	2.72-04	2.14-04	1.71-04	1.39-04
20	5.58-02	1.72-02	7.43-03	3.87-03	2.26-03	1.44-03	9.70-04	6.85-04	5.01-04	3.77-04	2.91-04	2.29-04	1.83-04	1.48-04
19	5.99-02	1.85-02	8.01-03	4.17-03	2.45-03	1.56-03	1.05-03	7.42-04	5.44-04	4.10-04	3.16-04	2.48-04	1.98-04	1.60-04
18	6.50-02	2.01-02	8.73-03	4.56-03	2.68-03	1.71-03	1.16-03	8.17-04	5.99-04	4.52-04	3.48-04	2.74-04	2.18-04	1.75-04
17	7.11-02	2.21-02	9.64-03	5.05-03	2.98-03	1.90-03	1.29-03	9.15-04	6.72-04	5.07-04	3.91-04	3.06-04	2.43-04	1.92-04
16	7.84-02	2.45-02	1.08-02	5.67-03	3.36-03	2.16-03	1.47-03	1.04-03	7.67-04	5.79-04	4.46-04	3.48-04	2.72-04	2.03-04
15	8.68-02	2.74-02	1.21-02	6.45-03	3.85-03	2.48-03	1.70-03	1.21-03	8.93-04	6.75-04	5.19-04	4.00-04	2.95-04	
14	9.63-02	3.09-02	1.38-02	7.44-03	4.48-03	2.92-03	2.01-03	1.44-03	1.07-03	8.04-04	6.11-04	4.46-04		
13	1.07-01	3.50-02	1.60-02	8.75-03	5.35-03	3.52-03	2.44-03	1.76-03	1.30-03	9.76-04	7.04-04			
12	1.19-01	4.01-02	1.88-02	1.05-02	6.56-03	4.38-03	3.07-03	2.22-03	1.63-03	1.16-03				
11	1.33-01	4.68-02	2.28-02	1.31-02	8.34-03	5.65-03	3.99-03	2.88-03	2.01-03					
10	1.53-01	5.63-02	2.87-02	1.71-02	1.11-02	7.61-03	5.36-03	3.68-03						
9	1.84-01	7.13-02	3.81-02	2.34-02	1.55-02	1.06-02	7.15-03							
8	2.40-01	9.65-02	5.38-02	3.39-02	2.26-02	1.49-02								
7	3.43-01	1.42-01	8.22-02	5.27-02	3.39-02									
6	5.44-01	2.33-01	1.38-01	8.68-02										
5	9.86-01	4.39-01	2.60-01											
4	2.18+00	1.00+00												
3	6.89+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.85-05	1.55-05	1.30-05	1.11-05	9.52-06	8.22-06	7.15-06	6.26-06	5.51-06	4.87-06	4.33-06	3.87-06	3.46-06	3.12-06
45	2.54-05	2.12-05	1.78-05	1.52-05	1.30-05	1.12-05	9.77-06	8.55-06	7.52-06	6.65-06	5.91-06	5.27-06	4.72-06	4.25-06
40	3.56-05	2.97-05	2.50-05	2.13-05	1.82-05	1.58-05	1.37-05	1.20-05	1.05-05	9.31-06	8.26-06	7.37-06	6.59-06	5.92-06
35	5.11-05	4.26-05	3.58-05	3.05-05	2.61-05	2.25-05	1.96-05	1.71-05	1.50-05	1.32-05	1.17-05	1.04-05	9.31-06	8.32-06
30	7.21-05	6.01-05	5.05-05	4.29-05	3.67-05	3.16-05	2.74-05	2.39-05	2.09-05	1.83-05	1.61-05	1.41-05	1.22-05	9.93-06
29	7.68-05	6.39-05	5.38-05	4.57-05	3.90-05	3.36-05	2.91-05	2.53-05	2.21-05	1.93-05	1.68-05	1.45-05	1.18-05	
28	8.14-05	6.78-05	5.70-05	4.84-05	4.13-05	3.56-05	3.07-05	2.67-05	2.32-05	2.01-05	1.72-05	1.40-05		
27	8.60-05	7.16-05	6.02-05	5.10-05	4.36-05	3.74-05	3.23-05	2.79-05	2.41-05	2.05-05	1.66-05			
26	9.04-05	7.52-05	6.32-05	5.35-05	4.56-05	3.91-05	3.36-05	2.89-05	2.45-05	1.97-05				
25	9.46-05	7.87-05	6.60-05	5.59-05	4.75-05	4.06-05	3.46-05	2.93-05	2.34-05					
24	9.87-05	8.21-05	6.88-05	5.81-05	4.92-05	4.18-05	3.50-05	2.79-05						
23	1.03-04	8.55-05	7.15-05	6.02-05	5.07-05	4.23-05	3.34-05							
22	1.08-04	8.93-05	7.45-05	6.22-05	5.15-05	4.05-05								
21	1.14-04	9.38-05	7.77-05	6.39-05	4.99-05									
20	1.21-04	9.91-05	8.08-05	6.26-05										
19	1.30-04	1.05-04	8.05-05											
18	1.40-04	1.06-04												
17	1.45-04													

HE + TE = 5.00+03 NE = 1.00+08 CASE B NC = 34

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-2.10-37	-1.09-36	-3.44-36	-8.63-36	-1.88-35	-3.68-35	-6.71-35	-1.16-34	-1.90-34	-3.02-34	-4.64-34	-6.94-34	-1.01-33
45	0.00+00	-2.88-37	-1.50-36	-4.75-36	-1.20-35	-2.61-35	-5.16-35	-9.46-35	-1.64-34	-2.73-34	-4.37-34	-6.79-34	-1.03-33	-1.52-33
40	0.00+00	-4.05-37	-2.12-36	-6.75-36	-1.71-35	-3.76-35	-7.48-35	-1.38-34	-2.43-34	-4.08-34	-6.63-34	-1.05-33	-1.61-33	-2.43-33
35	0.00+00	-5.75-37	-3.05-36	-9.78-36	-2.50-35	-5.54-35	-1.11-34	-2.09-34	-3.72-34	-6.37-34	-1.06-33	-1.71-33	-2.70-33	-4.19-33
30	0.00+00	-7.63-37	-4.23-36	-1.37-35	-3.55-35	-7.96-35	-1.63-34	-3.11-34	-5.66-34	-9.97-34	-1.71-33	-2.87-33	-4.74-33	-7.73-33
29	0.00+00	-7.93-37	-4.47-36	-1.46-35	-3.77-35	-8.49-35	-1.74-34	-3.34-34	-6.12-34	-1.09-33	-1.88-33	-3.18-33	-5.33-33	-8.82-33
28	0.00+00	-8.16-37	-4.69-36	-1.53-35	-3.98-35	-8.99-35	-1.85-34	-3.57-34	-6.58-34	-1.18-33	-2.06-33	-3.53-33	-5.98-33	-1.01-32
27	0.00+00	-8.27-37	-4.88-36	-1.60-35	-4.17-35	-9.44-35	-1.95-34	-3.78-34	-7.03-34	-1.27-33	-2.24-33	-3.90-33	-6.72-33	-1.15-32
26	0.00+00	-8.24-37	-5.02-36	-1.66-35	-4.33-35	-9.83-35	-2.04-34	-3.98-34	-7.45-34	-1.36-33	-2.43-33	-4.29-33	-7.53-33	-1.32-32
25	0.00+00	-8.03-37	-5.12-36	-1.70-35	-4.45-35	-1.01-34	-2.11-34	-4.14-34	-7.82-34	-1.44-33	-2.62-33	-4.71-33	-8.44-33	-1.52-32
24	0.00+00	-7.63-37	-5.17-36	-1.73-35	-4.54-35	-1.04-34	-2.16-34	-4.27-34	-8.14-34	-1.52-33	-2.80-33	-5.15-33	-9.47-33	-1.76-32
23	0.00+00	-7.03-37	-5.17-36	-1.74-35	-4.59-35	-1.05-34	-2.20-34	-4.36-34	-8.39-34	-1.59-33	-2.99-33	-5.63-33	-1.07-32	-2.06-32
22	0.00+00	-6.25-37	-5.14-36	-1.75-35	-4.62-35	-1.06-34	-2.22-34	-4.43-34	-8.62-34	-1.66-33	-3.19-33	-6.18-33	-1.22-32	-2.46-32
21	0.00+00	-5.30-37	-5.10-36	-1.76-35	-4.65-35	-1.06-34	-2.24-34	-4.50-34	-8.84-34	-1.73-33	-3.43-33	-6.88-33	-1.42-32	-3.05-32
20	0.00+00	-4.18-37	-5.07-36	-1.77-35	-4.70-35	-1.08-34	-2.27-34	-4.58-34	-9.11-34	-1.83-33	-3.73-33	-7.83-33	-1.72-32	-4.02-32
19	0.00+00	-2.84-37	-5.05-36	-1.80-35	-4.78-35	-1.10-34	-2.31-34	-4.69-34	-9.46-34	-1.95-33	-4.14-33	-9.23-33	-2.20-32	-5.82-32
18	0.00+00	-1.17-37	-5.04-36	-1.84-35	-4.90-35	-1.12-34	-2.37-34	-4.82-34	-9.88-34	-2.10-33	-4.71-33	-1.14-32	-3.07-32	-9.83-32
17	0.00+00	1.94-37	-4.98-36	-1.87-35	-5.03-35	-1.15-34	-2.42-34	-4.95-34	-1.03-33	-2.27-33	-5.49-33	-1.50-32	-4.89-32	-2.21-31
16	0.00+00	4.11-37	-4.82-36	-1.89-35	-5.13-35	-1.17-34	-2.45-34	-4.97-34	-1.04-33	-2.40-33	-6.44-33	-2.12-32	-9.87-32	-1.01-30
15	0.00+00	8.58-37	-4.42-36	-1.86-35	-5.12-35	-1.16-34	-2.37-34	-4.64-34	-9.45-34	-2.25-33	-6.98-33	-3.28-32	-3.57-31	
14	0.00+00	1.52-36	-3.56-36	-1.73-35	-4.82-35	-1.07-34	-2.02-34	-3.37-34	-5.00-34	-7.34-34	-1.93-33	-2.97-32		
13	0.00+00	2.54-36	-1.91-36	-1.37-35	-3.94-35	-7.99-35	-1.05-34	4.83-35	1.19-33	8.42-33	9.35-32			
12	0.00+00	4.11-36	1.11-36	-6.27-36	-1.90-35	-1.45-35	1.50-34	1.25-33	8.75-33	1.05-31				
11	0.00+00	6.52-36	6.40-36	8.34-36	2.50-35	1.42-34	8.66-34	5.93-33	7.40-32					
10	0.00+00	1.03-35	1.55-35	3.68-35	1.23-34	5.56-34	3.45-33	4.10-32						
9	0.00+00	1.62-35	3.17-35	9.68-35	3.79-34	2.05-33	2.19-32							
8	0.00+00	2.64-35	6.41-35	2.50-34	1.31-33	1.30-32								
7	0.00+00	4.63-35	1.43-34	8.16-34	8.89-33									
6	0.00+00	9.39-35	4.23-34	5.65-33										
5	0.00+00	2.53-34	2.73-33											
4	0.00+00	1.37-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.45-33	-2.03-33	-2.78-33	-3.75-33	-4.96-33	-6.43-33	-8.15-33	-1.01-32	-1.23-32	-1.47-32	-1.73-32	-2.00-32	-2.29-32	-2.61-32
45	-2.20-33	-3.13-33	-4.38-33	-6.02-33	-8.12-33	-1.08-32	-1.40-32	-1.79-32	-2.24-32	-2.77-32	-3.37-32	-4.07-32	-4.88-32	-5.84-32
40	-3.59-33	-5.23-33	-7.50-33	-1.06-32	-1.48-32	-2.03-32	-2.75-32	-3.66-32	-4.81-32	-6.27-32	-8.11-32	-1.05-31	-1.36-31	-1.77-31
35	-6.40-33	-9.68-33	-1.45-32	-2.14-32	-3.15-32	-4.59-32	-6.63-32	-9.54-32	-1.37-31	-1.97-31	-2.87-31	-4.26-31	-6.53-31	-1.05-30
30	-1.25-32	-2.02-32	-3.26-32	-5.27-32	-8.57-32	-1.41-31	-2.34-31	-3.99-31	-7.06-31	-1.33-30	-2.76-30	-6.80-30	-2.31-29	-1.73-28
29	-1.45-32	-2.39-32	-3.94-32	-6.55-32	-1.10-31	-1.88-31	-3.29-31	-5.97-31	-1.15-30	-2.45-30	-6.14-30	-2.12-29	-1.61-28	
28	-1.69-32	-2.85-32	-4.82-32	-8.28-32	-1.45-31	-2.60-31	-4.85-31	-9.60-31	-2.09-30	-5.37-30	-1.89-29	-1.46-28		
27	-1.98-32	-3.42-32	-5.99-32	-1.07-31	-1.97-31	-3.77-31	-7.66-31	-1.71-30	-4.52-30	-1.63-29	-1.29-28			
26	-2.33-32	-4.16-32	-7.58-32	-1.42-31	-2.79-31	-5.83-31	-1.34-30	-3.63-30	-1.35-29	-1.09-28				
25	-2.76-32	-5.13-32	-9.83-32	-1.97-31	-4.21-31	-9.96-31	-2.78-30	-1.06-29	-8.78-29					
24	-3.33-32	-6.49-32	-1.32-31	-2.89-31	-7.00-31	-2.01-30	-7.87-30	-6.73-29						
23	-4.09-32	-8.49-32	-1.89-31	-4.67-31	-1.37-30	-5.52-30	-4.86-29							
22	-5.20-32	-1.18-31	-2.96-31	-8.86-31	-3.66-30	-3.31-29								
21	-7.02-32	-1.79-31	-5.46-31	-2.29-30	-2.13-29									
20	-1.04-31	-3.22-31	-1.38-30	-1.30-29										
19	-1.83-31	-7.91-31	-7.57-30											
18	-4.34-31	-4.22-30												
17	-2.20-30													

HE + TE = 5.00+03 NE = 1.00+09 CASE B NC = 22

TOTAL RC = 3.388-12 4-3 RC = 6.443-13 4-3 EM = 2.731-24 2S RC = 9.551-13 2P RC = 2.433-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.65-03	2.65-03	1.14-03	5.91-04	3.45-04	2.18-04	1.47-04	1.04-04	7.57-05	5.70-05	4.40-05	3.47-05	2.78-05	2.26-05
45	1.20-02	3.67-03	1.58-03	8.18-04	4.77-04	3.02-04	2.03-04	1.43-04	1.05-04	7.89-05	6.08-05	4.79-05	3.84-05	3.13-05
40	1.72-02	5.29-03	2.27-03	1.18-03	6.86-04	4.35-04	2.92-04	2.06-04	1.51-04	1.13-04	8.75-05	6.89-05	5.52-05	4.49-05
35	2.60-02	7.98-03	3.43-03	1.77-03	1.04-03	6.55-04	4.41-04	3.11-04	2.27-04	1.71-04	1.32-04	1.04-04	8.31-05	6.76-05
30	4.14-02	1.27-02	5.45-03	2.82-03	1.65-03	1.04-03	7.00-04	4.93-04	3.60-04	2.71-04	2.09-04	1.64-04	1.32-04	1.07-04
29	4.57-02	1.40-02	6.02-03	3.11-03	1.82-03	1.15-03	7.73-04	5.44-04	3.98-04	2.99-04	2.31-04	1.81-04	1.45-04	1.18-04
28	5.05-02	1.55-02	6.65-03	3.44-03	2.01-03	1.27-03	8.54-04	6.01-04	4.39-04	3.30-04	2.55-04	2.00-04	1.60-04	1.30-04
27	5.59-02	1.71-02	7.36-03	3.81-03	2.22-03	1.41-03	9.45-04	6.65-04	4.86-04	3.65-04	2.82-04	2.21-04	1.77-04	1.44-04
26	6.18-02	1.90-02	8.14-03	4.22-03	2.46-03	1.55-03	1.05-03	7.36-04	5.37-04	4.04-04	3.11-04	2.45-04	1.96-04	1.59-04
25	6.84-02	2.10-02	9.01-03	4.66-03	2.72-03	1.72-03	1.16-03	8.13-04	5.94-04	4.46-04	3.44-04	2.70-04	2.16-04	1.75-04
24	7.55-02	2.32-02	9.94-03	5.15-03	3.00-03	1.90-03	1.27-03	8.97-04	6.55-04	4.92-04	3.79-04	2.98-04	2.38-04	1.93-04
23	8.31-02	2.55-02	1.09-02	5.66-03	3.30-03	2.09-03	1.40-03	9.86-04	7.19-04	5.41-04	4.16-04	3.27-04	2.61-04	2.12-04
22	9.00-02	2.76-02	1.19-02	6.14-03	3.58-03	2.27-03	1.52-03	1.07-03	7.82-04	5.87-04	4.52-04	3.55-04	2.84-04	2.30-04
21	9.76-02	2.99-02	1.29-02	6.65-03	3.88-03	2.45-03	1.65-03	1.16-03	8.47-04	6.36-04	4.89-04	3.84-04	3.06-04	2.48-04
20	1.05-01	3.21-02	1.38-02	7.13-03	4.16-03	2.63-03	1.77-03	1.24-03	9.07-04	6.81-04	5.24-04	4.11-04	3.27-04	2.64-04
19	1.11-01	3.40-02	1.46-02	7.56-03	4.41-03	2.79-03	1.87-03	1.32-03	9.61-04	7.21-04	5.54-04	4.34-04	3.45-04	2.77-04
18	1.16-01	3.56-02	1.53-02	7.93-03	4.62-03	2.93-03	1.97-03	1.38-03	1.01-03	7.56-04	5.80-04	4.53-04	3.59-04	2.87-04
17	1.21-01	3.72-02	1.60-02	8.29-03	4.83-03	3.06-03	2.05-03	1.44-03	1.05-03	7.89-04	6.04-04	4.71-04	3.70-04	2.91-04
16	1.27-01	3.90-02	1.68-02	8.71-03	5.08-03	3.22-03	2.16-03	1.52-03	1.11-03	8.27-04	6.32-04	4.89-04	3.79-04	2.80-04
15	1.35-01	4.16-02	1.79-02	9.31-03	5.43-03	3.44-03	2.31-03	1.63-03	1.18-03	8.81-04	6.69-04	5.10-04	3.72-04	
14	1.47-01	4.54-02	1.96-02	1.02-02	5.96-03	3.78-03	2.54-03	1.78-03	1.29-03	9.59-04	7.17-04	5.15-04		
13	1.64-01	5.07-02	2.20-02	1.15-02	6.71-03	4.26-03	2.87-03	2.01-03	1.45-03	1.06-03	7.50-04			
12	1.86-01	5.79-02	2.52-02	1.32-02	7.78-03	4.96-03	3.34-03	2.34-03	1.67-03	1.15-03				
11	2.15-01	6.75-02	2.97-02	1.57-02	9.31-03	5.96-03	4.02-03	2.78-03	1.88-03					
10	2.51-01	8.04-02	3.60-02	1.93-02	1.16-02	7.45-03	5.00-03	3.31-03						
9	2.99-01	9.83-02	4.53-02	2.48-02	1.51-02	9.77-03	6.29-03							
8	3.65-01	1.25-01	6.02-02	3.40-02	2.10-02	1.31-02								
7	4.71-01	1.72-01	8.68-02	5.05-02	3.04-02									
6	6.83-01	2.63-01	1.39-01	8.00-02										
5	1.17+00	4.67-01	2.48-01											
4	2.48+00	1.00+00												
3	7.45+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.86-05	1.56-05	1.31-05	1.12-05	9.57-06	8.27-06	7.19-06	6.29-06	5.54-06	4.90-06	4.35-06	3.89-06	3.48-06	3.13-06
45	2.58-05	2.15-05	1.81-05	1.54-05	1.32-05	1.14-05	9.93-06	8.69-06	7.64-06	6.76-06	6.01-06	5.36-06	4.80-06	4.32-06
40	3.70-05	3.09-05	2.60-05	2.21-05	1.90-05	1.64-05	1.42-05	1.25-05	1.09-05	9.68-06	8.59-06	7.66-06	6.85-06	6.15-06
35	5.57-05	4.64-05	3.91-05	3.32-05	2.85-05	2.46-05	2.13-05	1.86-05	1.64-05	1.44-05	1.28-05	1.14-05	1.02-05	9.08-06
30	8.82-05	7.34-05	6.18-05	5.24-05	4.48-05	3.86-05	3.35-05	2.91-05	2.55-05	2.23-05	1.96-05	1.71-05	1.48-05	1.21-05
29	9.72-05	8.09-05	6.80-05	5.77-05	4.93-05	4.25-05	3.67-05	3.19-05	2.79-05	2.43-05	2.12-05	1.82-05	1.48-05	
28	1.07-04	8.92-05	7.50-05	6.36-05	5.43-05	4.67-05	4.03-05	3.50-05	3.04-05	2.64-05	2.26-05	1.82-05		
27	1.18-04	9.85-05	8.27-05	7.01-05	5.98-05	5.13-05	4.42-05	3.82-05	3.30-05	2.81-05	2.26-05			
26	1.31-04	1.09-04	9.12-05	7.72-05	6.58-05	5.63-05	4.83-05	4.15-05	3.51-05	2.82-05				
25	1.44-04	1.20-04	1.00-04	8.48-05	7.21-05	6.15-05	5.24-05	4.42-05	3.52-05					
24	1.59-04	1.32-04	1.10-04	9.28-05	7.86-05	6.65-05	5.57-05	4.42-05						
23	1.74-04	1.44-04	1.20-04	1.01-04	8.47-05	7.05-05	5.55-05							
22	1.88-04	1.56-04	1.30-04	1.08-04	8.93-05	6.99-05								
21	2.03-04	1.67-04	1.38-04	1.13-04	8.80-05									
20	2.15-04	1.76-04	1.43-04	1.10-04										
19	2.24-04	1.80-04	1.38-04											
18	2.28-04	1.73-04												
17	2.18-04													

HE + TE = 5.00+03 NE = 1.00+09 CASE B NC = 22

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.99-37	-1.08-36	-3.46-36	-8.74-36	-1.90-35	-3.74-35	-6.80-35	-1.16-34	-1.89-34	-2.93-34	-4.38-34	-6.28-34	-8.64-34
45	0.00+00	-2.78-37	-1.51-36	-4.85-36	-1.23-35	-2.69-35	-5.32-35	-9.74-35	-1.68-34	-2.75-34	-4.32-34	-6.52-34	-9.47-34	-1.32-33
40	0.00+00	-4.04-37	-2.20-36	-7.09-36	-1.81-35	-3.99-35	-7.95-35	-1.47-34	-2.56-34	-4.25-34	-6.77-34	-1.04-33	-1.54-33	-2.19-33
35	0.00+00	-6.18-37	-3.38-36	-1.09-35	-2.81-35	-6.27-35	-1.27-34	-2.37-34	-4.21-34	-7.12-34	-1.16-33	-1.82-33	-2.77-33	-4.08-33
30	0.00+00	-9.96-37	-5.48-36	-1.79-35	-4.67-35	-1.06-34	-2.18-34	-4.18-34	-7.61-34	-1.33-33	-2.24-33	-3.67-33	-5.85-33	-9.07-33
29	0.00+00	-1.10-36	-6.07-36	-1.99-35	-5.21-35	-1.19-34	-2.45-34	-4.74-34	-8.69-34	-1.53-33	-2.60-33	-4.31-33	-6.96-33	-1.10-32
28	0.00+00	-1.22-36	-6.74-36	-2.22-35	-5.83-35	-1.33-34	-2.77-34	-5.39-34	-9.96-34	-1.77-33	-3.05-33	-5.11-33	-8.38-33	-1.34-32
27	0.00+00	-1.35-36	-7.49-36	-2.47-35	-6.53-35	-1.50-34	-3.14-34	-6.16-34	-1.15-33	-2.06-33	-3.59-33	-6.12-33	-1.02-32	-1.67-32
26	0.00+00	-1.49-36	-8.32-36	-2.76-35	-7.32-35	-1.69-34	-3.57-34	-7.05-34	-1.33-33	-2.41-33	-4.27-33	-7.39-33	-1.26-32	-2.11-32
25	0.00+00	-1.63-36	-9.23-36	-3.08-35	-8.20-35	-1.91-34	-4.06-34	-8.10-34	-1.54-33	-2.84-33	-5.11-33	-9.03-33	-1.57-32	-2.71-32
24	0.00+00	-1.79-36	-1.02-35	-3.42-35	-9.18-35	-2.15-34	-4.61-34	-9.31-34	-1.80-33	-3.37-33	-6.17-33	-1.11-32	-2.00-32	-3.55-32
23	0.00+00	-1.93-36	-1.12-35	-3.79-35	-1.02-34	-2.42-34	-5.24-34	-1.07-33	-2.10-33	-4.01-33	-7.51-33	-1.39-32	-2.58-32	-4.79-32
22	0.00+00	-2.03-36	-1.21-35	-4.12-35	-1.12-34	-2.67-34	-5.87-34	-1.22-33	-2.43-33	-4.74-33	-9.13-33	-1.75-32	-3.38-32	-6.60-32
21	0.00+00	-2.12-36	-1.30-35	-4.47-35	-1.23-34	-2.96-34	-6.58-34	-1.39-33	-2.83-33	-5.66-33	-1.13-32	-2.25-32	-4.57-32	-9.54-32
20	0.00+00	-2.14-36	-1.37-35	-4.78-35	-1.32-34	-3.23-34	-7.29-34	-1.57-33	-3.28-33	-6.77-33	-1.40-32	-2.94-32	-6.39-32	-1.46-31
19	0.00+00	-2.07-36	-1.42-35	-5.01-35	-1.40-34	-3.47-34	-7.97-34	-1.76-33	-3.78-33	-8.11-33	-1.76-32	-3.95-32	-9.37-32	-2.43-31
18	0.00+00	-1.88-36	-1.44-35	-5.15-35	-1.46-34	-3.67-34	-8.60-34	-1.94-33	-4.34-33	-9.76-33	-2.26-32	-5.53-32	-1.49-31	-4.68-31
17	0.00+00	-1.57-36	-1.42-35	-5.21-35	-1.50-34	-3.82-34	-9.17-34	-2.14-33	-5.00-33	-1.20-32	-3.01-32	-8.33-32	-2.71-31	-1.21-30
16	0.00+00	-1.15-36	-1.38-35	-5.23-35	-1.53-34	-3.98-34	-9.80-34	-2.38-33	-5.89-33	-1.53-32	-4.33-32	-1.45-31	-6.64-31	-6.66-30
15	0.00+00	-6.25-37	-1.35-35	-5.28-35	-1.57-34	-4.16-34	-1.07-33	-2.73-33	-7.30-33	-2.12-32	-7.26-32	-3.40-31	-3.50-30	
14	0.00+00	4.29-38	-1.31-35	-5.41-35	-1.65-34	-4.51-34	-1.20-33	-3.31-33	-9.89-33	-3.45-32	-1.65-31	-1.73-30		
13	0.00+00	9.39-37	-1.28-35	-5.63-35	-1.77-34	-5.03-34	-1.42-33	-4.34-33	-1.55-32	-7.56-32	-8.04-31			
12	0.00+00	2.25-36	-1.21-35	-5.88-35	-1.93-34	-5.75-34	-1.78-33	-6.39-33	-3.16-32	-3.43-31				
11	0.00+00	4.32-36	-1.04-35	-6.01-35	-2.09-34	-6.63-34	-2.32-33	-1.12-32	-1.21-31					
10	0.00+00	7.81-36	-5.98-36	-5.52-35	-2.09-34	-7.01-34	-2.88-33	-2.68-32						
9	0.00+00	1.40-35	4.87-36	-3.05-35	-1.25-34	-1.83-34	4.16-33							
8	0.00+00	2.58-35	3.16-35	6.13-35	4.15-34	8.29-33								
7	0.00+00	4.96-35	1.03-34	4.50-34	5.98-33									
6	0.00+00	1.05-34	3.52-34	3.83-33										
5	0.00+00	2.83-34	2.27-33											
4	0.00+00	1.48-33												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.13-33	-1.41-33	-1.66-33	-1.85-33	-1.95-33	-1.94-33	-1.81-33	-1.49-33	-1.06-33	-4.55-34	3.50-34	1.40-33	2.76-33	4.51-33
45	-1.76-33	-2.23-33	-2.69-33	-3.07-33	-3.34-33	-3.45-33	-3.39-33	-3.02-33	-2.47-33	-1.61-33	-3.76-34	1.37-33	3.79-33	7.13-33
40	-2.99-33	-3.90-33	-4.84-33	-5.73-33	-6.51-33	-7.10-33	-7.46-33	-7.32-33	-6.90-33	-5.90-33	-4.13-33	-1.16-33	3.60-33	1.12-32
35	-5.77-33	-7.85-33	-1.02-32	-1.28-32	-1.55-32	-1.83-32	-2.12-32	-2.36-32	-2.62-32	-2.84-32	-2.98-32	-2.90-32	-2.35-32	-6.36-33
30	-1.37-32	-1.99-32	-2.82-32	-3.90-32	-5.31-32	-7.20-32	-9.86-32	-1.36-31	-1.97-31	-3.04-31	-5.19-31	-1.04-30	-2.85-30	-1.68-29
29	-1.68-32	-2.50-32	-3.63-32	-5.17-32	-7.29-32	-1.03-31	-1.49-31	-2.21-31	-3.53-31	-6.22-31	-1.30-30	-3.75-30	-2.37-29	
28	-2.10-32	-3.21-32	-4.79-32	-7.05-32	-1.04-31	-1.55-31	-2.40-31	-3.90-31	-7.09-31	-1.53-30	-4.56-30	-2.99-29		
27	-2.67-32	-4.20-32	-6.48-32	-9.96-32	-1.54-31	-2.47-31	-4.18-31	-7.74-31	-1.71-30	-5.23-30	-3.54-29			
26	-3.47-32	-5.64-32	-9.08-32	-1.47-31	-2.43-31	-4.25-31	-8.17-31	-1.84-30	-5.77-30	-3.98-29				
25	-4.61-32	-7.81-32	-1.32-31	-2.29-31	-4.14-31	-8.21-31	-1.92-30	-6.12-30	-4.33-29					
24	-6.31-32	-1.13-31	-2.04-31	-3.65-31	-7.90-31	-1.90-30	-6.23-30	-4.51-29						
23	-8.95-32	-1.71-31	-3.38-31	-7.22-31	-1.79-30	-6.06-30	-4.40-29							
22	-1.32-31	-2.75-31	-6.16-31	-1.60-30	-5.60-30	-4.24-29								
21	-2.09-31	-4.93-31	-1.34-30	-4.92-30	-3.87-29									
20	-3.62-31	-1.04-30	-4.00-30	-3.29-29										
19	-7.34-31	-2.98-30	-2.58-29											
18	-2.00-30	-1.83-29												
17	-1.16-29													

HE + TE = 5.00+03 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 4.229-12 4-3 RC = 7.024-13 4-3 EM = 2.977-24 2S RC = 1.246-12 2P RC = 2.983-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.96-03	2.44-03	1.05-03	5.43-04	3.17-04	2.01-04	1.35-04	9.52-05	6.96-05	5.24-05	4.05-05	3.19-05	2.55-05	2.08-05
45	1.10-02	3.39-03	1.46-03	7.54-04	4.40-04	2.78-04	1.87-04	1.32-04	9.65-05	7.27-05	5.61-05	4.42-05	3.54-05	2.88-05
40	1.60-02	4.90-03	2.10-03	1.09-03	6.35-04	4.02-04	2.71-04	1.91-04	1.39-04	1.05-04	8.10-05	6.38-05	5.11-05	4.16-05
35	2.43-02	7.47-03	3.21-03	1.66-03	9.69-04	6.13-04	4.13-04	2.91-04	2.12-04	1.60-04	1.23-04	9.71-05	7.78-05	6.33-05
30	3.98-02	1.22-02	5.25-03	2.72-03	1.58-03	1.00-03	6.74-04	4.75-04	3.47-04	2.61-04	2.01-04	1.58-04	1.27-04	1.03-04
29	4.44-02	1.36-02	5.85-03	3.03-03	1.77-03	1.12-03	7.51-04	5.29-04	3.86-04	2.91-04	2.24-04	1.76-04	1.41-04	1.15-04
28	4.97-02	1.52-02	6.55-03	3.39-03	1.98-03	1.25-03	8.41-04	5.92-04	4.32-04	3.25-04	2.51-04	1.97-04	1.58-04	1.28-04
27	5.59-02	1.71-02	7.36-03	3.81-03	2.22-03	1.40-03	9.45-04	6.65-04	4.86-04	3.65-04	2.81-04	2.21-04	1.77-04	1.44-04
26	6.30-02	1.93-02	8.30-03	4.30-03	2.51-03	1.59-03	1.07-03	7.50-04	5.48-04	4.12-04	3.17-04	2.50-04	2.00-04	1.62-04
25	7.15-02	2.19-02	9.41-03	4.87-03	2.84-03	1.80-03	1.21-03	8.50-04	6.20-04	4.66-04	3.59-04	2.82-04	2.26-04	1.83-04
24	8.14-02	2.50-02	1.07-02	5.55-03	3.23-03	2.04-03	1.37-03	9.67-04	7.06-04	5.30-04	4.08-04	3.21-04	2.57-04	2.08-04
23	9.31-02	2.85-02	1.23-02	6.34-03	3.70-03	2.34-03	1.57-03	1.11-03	8.06-04	6.06-04	4.66-04	3.66-04	2.93-04	2.37-04
22	1.07-01	3.28-02	1.41-02	7.28-03	4.24-03	2.68-03	1.80-03	1.27-03	9.25-04	6.94-04	5.34-04	4.19-04	3.35-04	2.71-04
21	1.23-01	3.78-02	1.62-02	8.38-03	4.88-03	3.09-03	2.07-03	1.46-03	1.06-03	7.98-04	6.14-04	4.81-04	3.84-04	3.10-04
20	1.42-01	4.35-02	1.87-02	9.65-03	5.62-03	3.55-03	2.39-03	1.68-03	1.22-03	9.18-04	7.05-04	5.52-04	4.40-04	3.55-04
19	1.64-01	5.01-02	2.15-02	1.11-02	6.48-03	4.10-03	2.75-03	1.93-03	1.41-03	1.06-03	8.10-04	6.34-04	5.04-04	4.05-04
18	1.88-01	5.76-02	2.47-02	1.28-02	7.44-03	4.70-03	3.16-03	2.22-03	1.61-03	1.21-03	9.27-04	7.23-04	5.72-04	4.56-04
17	2.14-01	6.57-02	2.82-02	1.46-02	8.48-03	5.36-03	3.59-03	2.52-03	1.83-03	1.37-03	1.05-03	8.16-04	6.41-04	5.02-04
16	2.41-01	7.37-02	3.16-02	1.64-02	9.51-03	6.01-03	4.03-03	2.82-03	2.05-03	1.53-03	1.17-03	9.00-04	6.95-04	5.13-04
15	2.64-01	8.09-02	3.47-02	1.79-02	1.04-02	6.58-03	4.41-03	3.09-03	2.24-03	1.66-03	1.26-03	9.56-04	6.95-04	
14	2.82-01	8.64-02	3.71-02	1.92-02	1.11-02	7.02-03	4.70-03	3.28-03	2.37-03	1.75-03	1.30-03	9.31-04		
13	2.95-01	9.03-02	3.88-02	2.00-02	1.16-02	7.33-03	4.89-03	3.41-03	2.45-03	1.78-03	1.25-03			
12	3.08-01	9.45-02	4.05-02	2.09-02	1.22-02	7.65-03	5.10-03	3.53-03	2.49-03	1.71-03				
11	3.31-01	1.02-01	4.37-02	2.26-02	1.31-02	8.23-03	5.45-03	3.71-03	2.47-03					
10	3.72-01	1.15-01	4.93-02	2.55-02	1.48-02	9.25-03	6.04-03	3.89-03						
9	4.39-01	1.36-01	5.86-02	3.04-02	1.76-02	1.09-02	6.74-03							
8	5.39-01	1.68-01	7.34-02	3.83-02	2.21-02	1.30-02								
7	6.94-01	2.21-01	9.82-02	5.16-02	2.87-02									
6	9.56-01	3.14-01	1.44-01	7.44-02										
5	1.49+00	5.11-01	2.36-01											
4	2.92+00	1.00+00												
3	8.13+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.71-05	1.43-05	1.21-05	1.03-05	8.80-06	7.60-06	6.61-06	5.79-06	5.09-06	4.50-06	4.00-06	3.57-06	3.20-06	2.88-06
45	2.38-05	1.98-05	1.67-05	1.42-05	1.22-05	1.05-05	9.15-06	8.01-06	7.04-06	6.23-06	5.53-06	4.94-06	4.42-06	3.98-06
40	3.43-05	2.86-05	2.41-05	2.05-05	1.76-05	1.52-05	1.32-05	1.15-05	1.01-05	8.96-06	7.95-06	7.09-06	6.34-06	5.70-06
35	5.21-05	4.35-05	3.66-05	3.11-05	2.66-05	2.30-05	2.00-05	1.74-05	1.53-05	1.35-05	1.20-05	1.07-05	9.50-06	8.50-06
30	8.48-05	7.07-05	5.94-05	5.05-05	4.32-05	3.72-05	3.22-05	2.80-05	2.45-05	2.15-05	1.89-05	1.65-05	1.42-05	1.16-05
29	9.45-05	7.86-05	6.61-05	5.61-05	4.80-05	4.13-05	3.57-05	3.11-05	2.71-05	2.37-05	2.06-05	1.77-05	1.44-05	
28	1.06-04	8.78-05	7.38-05	6.26-05	5.35-05	4.60-05	3.97-05	3.44-05	2.99-05	2.59-05	2.22-05	1.80-05		
27	1.18-04	9.85-05	8.27-05	7.01-05	5.98-05	5.13-05	4.42-05	3.82-05	3.30-05	2.81-05	2.26-05			
26	1.33-04	1.11-04	9.30-05	7.87-05	6.71-05	5.74-05	4.93-05	4.23-05	3.58-05	2.87-05				
25	1.51-04	1.25-04	1.05-04	8.87-05	7.53-05	6.43-05	5.48-05	4.61-05	3.68-05					
24	1.71-04	1.42-04	1.19-04	1.00-04	8.47-05	7.17-05	6.01-05	4.76-05						
23	1.95-04	1.61-04	1.35-04	1.13-04	9.49-05	7.90-05	6.22-05							
22	2.22-04	1.83-04	1.53-04	1.27-04	1.05-04	8.22-05								
21	2.54-04	2.09-04	1.72-04	1.41-04	1.10-04									
20	2.89-04	2.36-04	1.92-04	1.48-04										
19	3.27-04	2.63-04	2.01-04											
18	3.63-04	2.74-04												
17	3.75-04													

HE + TE = 5.00+03 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.66-31	-1.77-37	-1.05-36	-3.36-36	-8.40-36	-1.80-35	-3.47-35	-6.10-35	-9.90-35	-1.48-34	-1.98-34	-2.30-34	-2.19-34	-1.45-34
45	3.65-31	-2.49-37	-1.47-36	-4.72-36	-1.19-35	-2.56-35	-4.95-35	-8.78-35	-1.44-34	-2.17-34	-2.95-34	-3.49-34	-3.43-34	-2.45-34
40	5.21-31	-3.66-37	-2.15-36	-6.94-36	-1.75-35	-3.82-35	-7.46-35	-1.34-34	-2.22-34	-3.39-34	-4.70-34	-5.73-34	-5.86-34	-4.58-34
35	7.80-31	-5.72-37	-3.34-36	-1.09-35	-2.77-35	-6.10-35	-1.21-34	-2.20-34	-3.72-34	-5.82-34	-8.29-34	-1.05-33	-1.14-33	-9.91-34
30	1.24-30	-9.68-37	-5.63-36	-1.85-35	-4.78-35	-1.07-34	-2.16-34	-4.04-34	-7.04-34	-1.14-33	-1.70-33	-2.28-33	-2.68-33	-2.69-33
29	1.38-30	-1.09-36	-6.32-36	-2.08-35	-5.40-35	-1.21-34	-2.47-34	-4.65-34	-8.15-34	-1.34-33	-2.01-33	-2.74-33	-3.30-33	-3.41-33
28	1.53-30	-1.23-36	-7.13-36	-2.35-35	-6.13-35	-1.39-34	-2.84-34	-5.38-34	-9.53-34	-1.58-33	-2.41-33	-3.34-33	-4.11-33	-4.40-33
27	1.71-30	-1.39-36	-8.08-36	-2.67-35	-7.01-35	-1.59-34	-3.29-34	-6.28-34	-1.12-33	-1.88-33	-2.92-33	-4.12-33	-5.21-33	-5.79-33
26	1.92-30	-1.59-36	-9.21-36	-3.06-35	-8.06-35	-1.85-34	-3.83-34	-7.39-34	-1.34-33	-2.27-33	-3.59-33	-5.18-33	-6.72-33	-7.80-33
25	2.17-30	-1.82-36	-1.05-35	-3.52-35	-9.32-35	-2.15-34	-4.51-34	-8.79-34	-1.61-33	-2.78-33	-4.48-33	-6.62-33	-8.08-33	-1.08-32
24	2.45-30	-2.09-36	-1.21-35	-4.07-35	-1.09-34	-2.53-34	-5.35-34	-1.06-33	-1.96-33	-3.45-33	-5.68-33	-8.64-33	-1.20-32	-1.53-32
23	2.80-30	-2.42-36	-1.41-35	-4.74-35	-1.27-34	-2.99-34	-6.41-34	-1.28-33	-2.43-33	-4.36-33	-7.36-33	-1.16-32	-1.68-32	-2.27-32
22	3.20-30	-2.80-36	-1.63-35	-5.55-35	-1.50-34	-3.57-34	-7.75-34	-1.58-33	-3.05-33	-5.60-33	-9.76-33	-1.59-32	-2.43-32	-3.51-32
21	3.69-30	-3.26-36	-1.91-35	-6.53-35	-1.79-34	-4.30-34	-9.48-34	-1.97-33	-3.89-33	-7.36-33	-1.33-32	-2.27-32	-3.69-32	-5.78-32
20	4.29-30	-3.77-36	-2.23-35	-7.69-35	-2.13-34	-5.20-34	-1.17-33	-2.48-33	-5.04-33	-9.86-33	-1.86-32	-3.37-32	-5.89-32	-1.02-31
19	5.03-30	-4.37-36	-2.61-35	-9.10-35	-2.55-34	-6.34-34	-1.46-33	-3.17-33	-6.68-33	-1.37-32	-2.73-32	-5.30-32	-1.02-31	-2.03-31
18	5.94-30	-5.01-36	-3.04-35	-1.07-34	-3.07-34	-7.77-34	-1.83-33	-4.12-33	-9.04-33	-1.95-32	-4.18-32	-8.95-32	-1.97-31	-4.83-31
17	7.09-30	-5.63-36	-3.51-35	-1.26-34	-3.67-34	-9.51-34	-2.31-33	-5.42-33	-1.25-32	-2.90-32	-6.83-32	-1.67-31	-4.51-31	-1.58-30
16	8.56-30	-6.11-36	-3.98-35	-1.46-34	-4.33-34	-1.16-33	-2.92-33	-7.21-33	-1.78-32	-4.53-32	-1.22-31	-3.65-31	-1.41-30	-1.12-29
15	1.05-29	-6.27-36	-4.37-35	-1.64-34	-5.01-34	-1.39-33	-3.68-33	-9.69-33	-2.62-32	-7.61-32	-2.50-31	-1.07-30	-9.37-30	
14	1.30-29	-5.86-36	-4.59-35	-1.78-34	-5.63-34	-1.63-33	-4.59-33	-1.32-32	-4.06-32	-1.44-31	-6.75-31	-6.57-30		
13	1.65-29	-4.72-36	-4.61-35	-1.87-34	-6.15-34	-1.89-33	-5.77-33	-1.87-32	-7.00-32	-3.52-31	-3.76-30			
12	2.13-29	-2.86-36	-4.49-35	-1.93-34	-6.71-34	-2.21-33	-7.59-33	-2.97-32	-1.56-31	-1.77-30				
11	2.82-29	-2.74-37	-4.37-35	-2.04-34	-7.60-34	-2.79-33	-1.14-32	-6.23-32	-7.32-31					
10	3.86-29	3.39-36	-4.31-35	-2.27-34	-9.39-34	-4.08-33	-2.31-32	-2.79-31						
9	5.49-29	9.31-36	-4.25-35	-2.71-34	-1.32-33	-7.81-33	-9.68-32							
8	8.24-29	2.04-35	-3.72-35	-3.41-34	-2.24-33	-2.80-32								
7	1.33-28	4.43-35	-9.23-36	-4.07-34	-5.13-33									
6	2.39-28	1.06-34	1.38-34	6.22-34										
5	5.12-28	3.12-34	1.50-33											
4	1.53-27	1.66-33												
3	1.11-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-9.37-37	2.14-34	5.01-34	8.61-34	1.30-33	1.85-33	2.50-33	3.28-33	4.22-33	5.37-33	6.77-33	8.49-33	1.06-32	1.32-32
45	-4.06-35	2.75-34	7.08-34	1.27-33	1.97-33	2.88-33	3.98-33	5.35-33	7.07-33	9.23-33	1.20-32	1.55-32	2.01-32	2.62-32
40	-1.58-34	3.34-34	1.04-33	1.99-33	3.24-33	4.92-33	7.05-33	9.87-33	1.36-32	1.86-32	2.55-32	3.50-32	4.84-32	6.79-32
35	-5.40-34	2.80-34	1.55-33	3.39-33	5.99-33	9.77-33	1.50-32	2.26-32	3.38-32	5.07-32	7.72-32	1.21-31	1.95-31	3.33-31
30	-2.09-33	-6.53-34	1.97-33	6.35-33	1.35-32	2.57-32	4.60-32	8.23-32	1.51-31	2.94-31	6.34-31	1.62-30	5.76-30	4.51-29
29	-2.83-33	-1.24-33	1.83-33	7.22-33	1.65-32	3.32-32	6.27-32	1.20-31	2.39-31	5.26-31	1.37-30	4.91-30	3.89-29	
28	-3.90-33	-2.18-33	1.42-33	8.15-33	2.04-32	4.41-32	8.95-32	1.87-31	4.22-31	1.12-30	4.09-30	3.28-29		
27	-5.48-33	-3.71-33	4.88-34	8.99-33	2.58-32	6.11-32	1.37-31	3.24-31	8.88-31	3.31-30	2.70-29			
26	-7.88-33	-6.24-33	-1.49-33	9.33-33	3.31-32	8.95-32	2.30-31	6.66-31	2.57-30	2.15-29				
25	-1.17-32	-1.06-32	-5.63-33	8.06-33	4.30-32	1.42-31	4.55-31	1.87-30	1.63-29					
24	-1.79-32	-1.86-32	-1.46-32	1.75-33	5.54-32	2.56-31	1.20-30	1.14-29						
23	-2.87-32	-3.40-32	-3.54-32	-2.11-32	6.19-32	5.79-31	6.65-30							
22	-4.89-32	-6.67-32	-8.91-32	-1.08-31	-2.24-32	2.31-30								
21	-9.01-32	-1.46-31	-2.58-31	-5.51-31	-1.75-30									
20	-1.84-31	-3.74-31	-9.87-31	-5.31-30										
19	-4.54-31	-1.34-30	-8.35-30											
18	-1.55-30	-1.05-29												
17	-1.15-29													

HE + TE = 5.00+03 NE = 1.00+11 CASE B NC = 20

TOTAL RC = 6.127-12 4-3 RC = 9.231-13 4-3 EM = 3.912-24 2S RC = 1.737-12 2P RC = 4.390-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.06-03	1.86-03	7.99-04	4.14-04	2.41-04	1.53-04	1.03-04	7.25-05	5.30-05	3.99-05	3.08-05	2.43-05	1.94-05	1.58-05
45	8.40-03	2.58-03	1.11-03	5.74-04	3.35-04	2.12-04	1.43-04	1.01-04	7.35-05	5.53-05	4.27-05	3.36-05	2.70-05	2.19-05
40	1.22-02	3.73-03	1.60-03	8.30-04	4.84-04	3.07-04	2.06-04	1.45-04	1.06-04	8.00-05	6.17-05	4.86-05	3.90-05	3.17-05
35	1.86-02	5.70-03	2.45-03	1.27-03	7.40-04	4.68-04	3.15-04	2.22-04	1.62-04	1.22-04	9.42-05	7.41-05	5.94-05	4.83-05
30	3.06-02	9.38-03	4.03-03	2.09-03	1.22-03	7.70-04	5.18-04	3.65-04	2.66-04	2.00-04	1.55-04	1.22-04	9.74-05	7.91-05
29	3.42-02	1.05-02	4.50-03	2.33-03	1.36-03	8.60-04	5.78-04	4.07-04	2.98-04	2.24-04	1.73-04	1.36-04	1.09-04	8.83-05
28	3.84-02	1.18-02	5.05-03	2.62-03	1.52-03	9.65-04	6.49-04	4.57-04	3.34-04	2.51-04	1.93-04	1.52-04	1.22-04	9.90-05
27	4.33-02	1.33-02	5.70-03	2.95-03	1.72-03	1.09-03	7.32-04	5.15-04	3.76-04	2.83-04	2.18-04	1.71-04	1.37-04	1.11-04
26	4.91-02	1.50-02	6.46-03	3.34-03	1.95-03	1.23-03	8.29-04	5.84-04	4.26-04	3.20-04	2.47-04	1.94-04	1.55-04	1.26-04
25	5.59-02	1.71-02	7.37-03	3.81-03	2.22-03	1.41-03	9.45-04	6.65-04	4.85-04	3.65-04	2.81-04	2.21-04	1.77-04	1.43-04
24	6.42-02	1.97-02	8.45-03	4.37-03	2.55-03	1.61-03	1.08-03	7.62-04	5.56-04	4.18-04	3.22-04	2.53-04	2.02-04	1.64-04
23	7.41-02	2.27-02	9.76-03	5.05-03	2.94-03	1.86-03	1.25-03	8.80-04	6.42-04	4.82-04	3.71-04	2.92-04	2.33-04	1.89-04
22	8.63-02	2.65-02	1.14-02	5.88-03	3.42-03	2.16-03	1.45-03	1.02-03	7.46-04	5.60-04	4.31-04	3.38-04	2.70-04	2.19-04
21	1.01-01	3.10-02	1.33-02	6.89-03	4.01-03	2.54-03	1.70-03	1.20-03	8.74-04	6.56-04	5.04-04	3.96-04	3.15-04	2.55-04
20	1.20-01	3.67-02	1.57-02	8.14-03	4.74-03	3.00-03	2.01-03	1.41-03	1.03-03	7.74-04	5.94-04	4.66-04	3.71-04	2.99-04
19	1.43-01	4.38-02	1.88-02	9.72-03	5.66-03	3.58-03	2.40-03	1.69-03	1.23-03	9.21-04	7.07-04	5.53-04	4.39-04	3.53-04
18	1.72-01	5.28-02	2.26-02	1.17-02	6.81-03	4.30-03	2.89-03	2.03-03	1.48-03	1.11-03	8.47-04	6.61-04	5.23-04	4.17-04
17	2.10-01	6.42-02	2.75-02	1.42-02	8.28-03	5.23-03	3.51-03	2.46-03	1.79-03	1.34-03	1.02-03	7.95-04	6.24-04	4.89-04
16	2.57-01	7.87-02	3.38-02	1.74-02	1.01-02	6.40-03	4.29-03	3.01-03	2.18-03	1.63-03	1.24-03	9.56-04	7.38-04	5.44-04
15	3.17-01	9.71-02	4.16-02	2.15-02	1.25-02	7.88-03	5.27-03	3.69-03	2.67-03	1.98-03	1.50-03	1.14-03	8.26-04	
14	3.91-01	1.20-01	5.13-02	2.65-02	1.54-02	9.68-03	6.47-03	4.52-03	3.26-03	2.40-03	1.78-03	1.27-03		
13	4.76-01	1.46-01	6.24-02	3.22-02	1.87-02	1.17-02	7.83-03	5.45-03	3.90-03	2.83-03	1.98-03			
12	5.63-01	1.72-01	7.37-02	3.80-02	2.20-02	1.38-02	9.17-03	6.33-03	4.46-03	3.04-03				
11	6.32-01	1.93-01	8.26-02	4.25-02	2.46-02	1.54-02	1.01-02	6.89-03	4.57-03					
10	6.69-01	2.04-01	8.73-02	4.49-02	2.59-02	1.61-02	1.04-02	6.67-03						
9	6.97-01	2.13-01	9.08-02	4.65-02	2.66-02	1.63-02	9.97-03							
8	7.67-01	2.34-01	9.97-02	5.08-02	2.87-02	1.66-02								
7	9.25-01	2.83-01	1.20-01	6.06-02	3.24-02									
6	1.23+00	3.78-01	1.60-01	7.69-02										
5	1.85+00	5.69-01	2.33-01											
4	3.38+00	1.00+00												
3	8.69+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.31-05	1.09-05	9.18-06	7.81-06	6.70-06	5.79-06	5.03-06	4.40-06	3.88-06	3.43-06	3.05-06	2.72-06	2.44-06	2.19-06
45	1.81-05	1.51-05	1.27-05	1.08-05	9.28-06	8.01-06	6.97-06	6.10-06	5.36-06	4.74-06	4.21-06	3.76-06	3.37-06	3.03-06
40	2.61-05	2.18-05	1.84-05	1.56-05	1.34-05	1.16-05	1.00-05	8.79-06	7.73-06	6.83-06	6.06-06	5.40-06	4.84-06	4.34-06
35	3.98-05	3.32-05	2.80-05	2.38-05	2.03-05	1.76-05	1.53-05	1.33-05	1.17-05	1.03-05	9.15-06	8.14-06	7.26-06	6.49-06
30	6.52-05	5.43-05	4.57-05	3.88-05	3.32-05	2.86-05	2.47-05	2.15-05	1.88-05	1.65-05	1.45-05	1.27-05	1.09-05	8.92-06
29	7.27-05	6.05-05	5.09-05	4.32-05	3.69-05	3.18-05	2.75-05	2.39-05	2.09-05	1.82-05	1.59-05	1.36-05	1.11-05	
28	8.15-05	6.78-05	5.70-05	4.83-05	4.13-05	3.55-05	3.07-05	2.66-05	2.31-05	2.00-05	1.71-05	1.39-05		
27	9.17-05	7.63-05	6.41-05	5.43-05	4.63-05	3.98-05	3.43-05	2.96-05	2.55-05	2.17-05	1.75-05			
26	1.04-04	8.62-05	7.24-05	6.12-05	5.22-05	4.47-05	3.83-05	3.29-05	2.79-05	2.23-05				
25	1.18-04	9.79-05	8.21-05	6.94-05	5.90-05	5.03-05	4.28-05	3.61-05	3.75-05					
24	1.35-04	1.12-04	9.36-05	7.89-05	6.68-05	5.65-05	4.73-05	3.75-05						
23	1.55-04	1.28-04	1.07-04	9.00-05	7.56-05	6.29-05	4.96-05							
22	1.79-04	1.48-04	1.23-04	1.03-04	8.47-05	6.63-05								
21	2.08-04	1.72-04	1.42-04	1.16-04	9.01-05									
20	2.43-04	1.99-04	1.61-04	1.24-04										
19	2.85-04	2.29-04	1.75-04											
18	3.31-04	2.50-04												
17	3.65-04													

HE + TE = 5.00+03 NE = 1.00+11 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.85-31	-1.49-37	-9.41-37	-2.93-36	-7.02-36	-1.40-35	-2.33-35	-2.92-35	-1.65-35	3.42-35	1.31-34	2.69-34	4.42-34	6.50-34
45	5.29-31	-2.10-37	-1.32-36	-4.12-36	-9.94-36	-2.00-35	-3.35-35	-4.29-35	-2.63-35	4.45-35	1.82-34	3.82-34	6.39-34	9.51-34
40	7.55-31	-3.11-37	-1.94-36	-6.10-36	-1.48-35	-3.01-35	-5.11-35	-6.70-35	-4.54-35	5.79-35	2.65-34	5.73-34	9.78-34	1.48-33
35	1.13-30	-4.91-37	-3.04-36	-9.60-36	-2.36-35	-4.85-35	-8.43-35	-1.14-34	-8.74-35	7.13-35	4.06-34	9.23-34	1.63-33	2.54-33
30	1.80-30	-8.48-37	-5.18-36	-1.65-35	-4.13-35	-8.69-35	-1.56-34	-2.22-34	-1.97-34	6.25-35	6.61-34	1.64-33	3.07-33	5.05-33
29	2.00-30	-9.59-37	-5.84-36	-1.87-35	-4.69-35	-9.93-35	-1.79-34	-2.59-34	-2.38-34	5.06-35	7.33-34	1.88-33	3.56-33	5.95-33
28	2.22-30	-1.09-36	-6.62-36	-2.13-35	-5.36-35	-1.14-34	-2.08-34	-3.05-34	-2.90-34	3.11-35	8.15-34	2.15-33	4.17-33	7.09-33
27	2.48-30	-1.25-36	-7.55-36	-2.43-35	-6.16-35	-1.32-34	-2.43-34	-3.62-34	-3.57-34	4.33-38	9.06-34	2.49-33	4.93-33	8.56-33
26	2.79-30	-1.44-36	-8.66-36	-2.80-35	-7.14-35	-1.55-34	-2.87-34	-4.35-34	-4.46-34	-4.86-35	1.01-33	2.90-33	5.91-33	1.05-32
25	3.14-30	-1.67-36	-1.00-35	-3.26-35	-8.35-35	-1.82-34	-3.43-34	-5.29-34	-5.66-34	-1.24-34	1.11-33	3.42-33	7.18-33	1.31-32
24	3.56-30	-1.95-36	-1.17-35	-3.81-35	-9.85-35	-2.17-34	-4.14-34	-6.52-34	-7.29-34	-2.43-34	1.22-33	4.05-33	8.86-33	1.68-32
23	4.05-30	-2.29-36	-1.37-35	-4.50-35	-1.17-34	-2.62-34	-5.06-34	-8.17-34	-9.56-34	-4.30-34	1.31-33	4.86-33	1.12-32	2.22-32
22	4.64-30	-2.73-36	-1.62-35	-5.37-35	-1.41-34	-3.20-34	-6.29-34	-1.04-33	-1.28-33	-7.30-34	1.36-33	5.68-33	1.44-32	3.02-32
21	5.35-30	-3.28-36	-1.94-35	-6.49-35	-1.73-34	-3.96-34	-7.95-34	-1.35-33	-1.76-33	-1.22-33	1.30-33	7.19-33	1.91-32	4.33-32
20	6.22-30	-3.97-36	-2.35-35	-7.92-35	-2.14-34	-4.98-34	-1.02-33	-1.80-33	-2.47-33	-2.04-33	9.89-34	8.87-33	2.64-32	6.63-32
19	7.28-30	-4.87-36	-2.88-35	-9.81-35	-2.69-34	-6.39-34	-1.35-33	-2.47-33	-3.60-33	-3.49-33	4.96-35	1.08-32	3.83-32	1.11-31
18	8.60-30	-6.04-36	-3.57-35	-1.23-34	-3.44-34	-8.37-34	-1.82-33	-3.49-33	-5.47-33	-6.16-33	-2.37-33	1.27-32	5.92-32	2.17-31
17	1.03-29	-7.58-36	-4.49-35	-1.57-34	-4.48-34	-1.12-33	-2.54-33	-5.12-33	-8.70-33	-1.14-32	-8.67-33	1.21-32	1.01-31	5.62-31
16	1.24-29	-9.60-36	-5.72-35	-2.04-34	-5.96-34	-1.55-33	-3.66-33	-7.86-33	-1.47-32	-2.27-32	-2.64-32	-3.02-33	2.00-31	2.96-30
15	1.52-29	-1.22-35	-7.35-35	-2.68-34	-8.09-34	-2.19-33	-5.48-33	-1.27-32	-2.68-32	-5.02-32	-8.52-32	-1.18-31	4.48-31	
14	1.89-29	-1.55-35	-9.48-35	-3.56-34	-1.12-33	-3.18-33	-8.59-33	-2.21-32	-5.44-32	-1.31-31	-3.56-31	-1.67-30		
13	2.39-29	-1.92-35	-1.21-34	-4.72-34	-1.56-33	-4.76-33	-1.41-32	-4.21-32	-1.29-31	-4.62-31	-3.10-30			
12	3.08-29	-2.25-35	-1.51-34	-6.15-34	-2.16-33	-7.24-33	-2.47-32	-9.11-32	-4.08-31	-3.44-30				
11	4.09-29	-2.38-35	-1.76-34	-7.66-34	-2.93-33	-1.12-32	-4.70-32	-2.51-31	-2.62-30					
10	5.59-29	-2.09-35	-1.89-34	-8.99-34	-3.89-33	-1.81-32	-1.09-31	-1.34-30						
9	7.96-29	-1.33-35	-1.93-34	-1.04-33	-5.43-33	-3.55-32	-4.84-31							
8	1.19-28	-9.69-37	-2.03-34	-1.34-33	-9.72-33	-1.41-31								
7	1.93-28	2.14-35	-2.35-34	-2.27-33	-3.61-32									
6	3.46-28	7.67-35	-3.06-34	-7.26-33										
5	7.41-28	2.77-34	-2.97-34											
4	2.22-27	1.68-33												
3	1.61-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.96-34	1.18-33	1.53-33	1.93-33	2.41-33	2.99-33	3.68-33	4.51-33	5.51-33	6.73-33	8.21-33	1.00-32	1.23-32	1.51-32
45	1.33-33	1.78-33	2.32-33	2.98-33	3.78-33	4.78-33	6.00-33	7.51-33	9.39-33	1.18-32	1.48-32	1.86-32	2.36-32	3.01-32
40	2.11-33	2.88-33	3.85-33	5.05-33	6.58-33	8.55-33	1.11-32	1.43-32	1.86-32	2.44-32	3.22-32	4.29-32	5.81-32	7.99-32
35	3.73-33	5.26-33	7.26-33	9.92-33	1.35-32	1.84-32	2.52-32	3.48-32	4.87-32	6.96-32	1.02-31	1.54-31	2.43-31	4.06-31
30	7.81-33	1.17-32	1.72-32	2.53-32	3.76-32	5.69-32	8.82-32	1.42-31	2.42-31	4.43-31	9.11-31	2.25-30	7.73-30	5.92-29
29	9.34-33	1.42-32	2.14-32	3.22-32	4.92-32	7.72-32	1.25-31	2.14-31	3.95-31	8.15-31	2.02-30	6.96-30	5.33-29	
28	1.13-32	1.76-32	2.71-32	4.21-32	6.67-32	1.09-31	1.88-31	3.50-31	7.25-31	1.80-30	6.23-30	4.79-29		
27	1.40-32	2.23-32	3.54-32	5.69-32	9.43-32	1.64-31	3.07-31	6.40-31	1.60-30	5.55-30	4.28-29			
26	1.76-32	2.89-32	4.76-32	8.02-32	1.41-31	2.67-31	5.61-31	1.41-30	4.91-30	3.80-29				
25	2.28-32	3.88-32	6.69-32	1.20-31	2.28-31	4.85-31	1.23-30	4.31-30	3.36-29					
24	3.03-32	5.41-32	9.92-32	1.93-31	4.14-31	1.06-30	3.75-30	2.93-29						
23	4.19-32	7.97-32	1.59-31	3.47-31	8.98-31	3.21-30	2.54-29							
22	6.11-32	1.26-31	2.84-31	7.48-31	2.71-30	2.16-29								
21	9.56-32	2.24-31	6.06-31	2.24-30	1.82-29									
20	1.66-31	4.72-31	1.79-30	1.48-29										
19	3.41-31	1.36-30	1.16-29											
18	9.53-31	8.60-30												
17	5.69-30													

HE + TE = 5.00+03 NE = 1.00+12 CASE B NC = 20

TOTAL RC = 1.113-11 4-3 RC = 1.672-12 4-3 EM = 7.087-24 2S RC = 2.632-12 2P RC = 8.497-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.34-03	1.03-03	4.41-04	2.28-04	1.33-04	8.44-05	5.68-05	4.00-05	2.93-05	2.20-05	1.70-05	1.34-05	1.07-05	8.74-06
45	4.64-03	1.42-03	6.12-04	3.17-04	1.85-04	1.17-04	7.88-05	5.55-05	4.06-05	3.06-05	2.36-05	1.86-05	1.49-05	1.21-05
40	6.72-03	2.06-03	8.85-04	4.59-04	2.67-04	1.69-04	1.14-04	8.03-05	5.87-05	4.42-05	3.41-05	2.68-05	2.15-05	1.75-05
35	1.03-02	3.15-03	1.35-03	7.01-04	4.09-04	2.59-04	1.74-04	1.23-04	8.96-05	6.75-05	5.20-05	4.10-05	3.28-05	2.67-05
30	1.69-02	5.19-03	2.23-03	1.15-03	6.73-04	4.26-04	2.86-04	2.02-04	1.47-04	1.11-04	8.55-05	6.73-05	5.39-05	4.38-05
29	1.89-02	5.80-03	2.49-03	1.29-03	7.52-04	4.76-04	3.20-04	2.25-04	1.65-04	1.24-04	9.55-05	7.51-05	6.01-05	4.89-05
28	2.12-02	6.51-03	2.80-03	1.45-03	8.44-04	5.34-04	3.59-04	2.53-04	1.85-04	1.39-04	1.07-04	8.43-05	6.74-05	5.48-05
27	2.40-02	7.35-03	3.16-03	1.63-03	9.52-04	6.03-04	4.05-04	2.85-04	2.08-04	1.57-04	1.21-04	9.50-05	7.60-05	6.17-05
26	2.72-02	8.34-03	3.58-03	1.85-03	1.08-03	6.84-04	4.60-04	3.24-04	2.36-04	1.78-04	1.37-04	1.08-04	8.61-05	6.99-05
25	3.10-02	9.52-03	4.09-03	2.12-03	1.23-03	7.80-04	5.24-04	3.69-04	2.69-04	2.03-04	1.56-04	1.23-04	9.81-05	7.96-05
24	3.57-02	1.09-02	4.70-03	2.43-03	1.42-03	8.96-04	6.02-04	4.24-04	3.09-04	2.33-04	1.79-04	1.41-04	1.12-04	9.12-05
23	4.13-02	1.27-02	5.44-03	2.81-03	1.64-03	1.04-03	6.97-04	4.90-04	3.58-04	2.69-04	2.07-04	1.62-04	1.30-04	1.05-04
22	4.82-02	1.48-02	6.34-03	3.28-03	1.91-03	1.21-03	8.12-04	5.72-04	4.17-04	3.13-04	2.41-04	1.89-04	1.51-04	1.22-04
21	5.68-02	1.74-02	7.47-03	3.86-03	2.25-03	1.42-03	9.56-04	6.72-04	4.90-04	3.68-04	2.83-04	2.22-04	1.77-04	1.43-04
20	6.75-02	2.07-02	8.88-03	4.59-03	2.67-03	1.69-03	1.14-03	7.98-04	5.82-04	4.36-04	3.35-04	2.63-04	2.09-04	1.69-04
19	8.12-02	2.49-02	1.07-02	5.52-03	3.22-03	2.03-03	1.36-03	9.58-04	6.98-04	5.23-04	4.02-04	3.14-04	2.50-04	2.00-04
18	9.90-02	3.03-02	1.30-02	6.73-03	3.92-03	2.47-03	1.66-03	1.17-03	8.48-04	6.35-04	4.87-04	3.80-04	3.01-04	2.40-04
17	1.23-01	3.75-02	1.61-02	8.32-03	4.84-03	3.06-03	2.05-03	1.44-03	1.05-03	7.82-04	5.98-04	4.65-04	3.65-04	2.86-04
16	1.54-01	4.72-02	2.02-02	1.05-02	6.08-03	3.84-03	2.57-03	1.80-03	1.31-03	9.76-04	7.43-04	5.73-04	4.43-04	3.26-04
15	1.98-01	6.05-02	2.59-02	1.34-02	7.79-03	4.91-03	3.29-03	2.30-03	1.66-03	1.24-03	9.35-04	7.09-04	5.15-04	
14	2.59-01	7.92-02	3.39-02	1.75-02	1.02-02	6.40-03	4.28-03	2.99-03	2.15-03	1.59-03	1.18-03	8.41-04		
13	3.46-01	1.06-01	4.53-02	2.34-02	1.35-02	8.52-03	5.68-03	3.95-03	2.83-03	2.05-03	1.43-03			
12	4.72-01	1.44-01	6.17-02	3.18-02	1.84-02	1.15-02	7.66-03	5.29-03	3.72-03	2.54-03				
11	6.50-01	1.99-01	8.49-02	4.36-02	2.52-02	1.58-02	1.04-02	7.04-03	4.66-03					
10	8.87-01	2.71-01	1.15-01	5.93-02	3.41-02	2.11-02	1.37-02	8.74-03						
9	1.14+00	3.48-01	1.48-01	7.58-02	4.33-02	2.64-02	1.61-02							
8	1.31+00	3.98-01	1.69-01	8.57-02	4.81-02	2.76-02								
7	1.37+00	4.15-01	1.75-01	8.74-02	4.63-02									
6	1.54+00	4.65-01	1.93-01	9.10-02										
5	2.09+00	6.20-01	2.44-01											
4	3.55+00	1.00+00												
3	8.70+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.21-06	6.01-06	5.07-06	4.31-06	3.70-06	3.19-06	2.78-06	2.43-06	2.14-06	1.89-06	1.68-06	1.50-06	1.35-06	1.21-06
45	9.99-06	8.33-06	7.02-06	5.97-06	5.12-06	4.42-06	3.85-06	3.37-06	2.96-06	2.62-06	2.33-06	2.08-06	1.86-06	1.67-06
40	1.44-05	1.20-05	1.01-05	8.62-06	7.39-06	6.38-06	5.55-06	4.85-06	4.27-06	3.77-06	3.35-06	2.98-06	2.67-06	2.40-06
35	2.20-05	1.83-05	1.54-05	1.31-05	1.12-05	9.70-06	8.42-06	7.36-06	6.46-06	5.70-06	5.05-06	4.50-06	4.01-06	3.58-06
30	3.60-05	3.00-05	2.53-05	2.14-05	1.83-05	1.58-05	1.37-05	1.19-05	1.04-05	9.13-06	8.01-06	7.01-06	6.13-06	4.93-06
29	4.02-05	3.35-05	2.82-05	2.39-05	2.04-05	1.76-05	1.52-05	1.32-05	1.15-05	1.01-05	8.77-06	7.54-06	6.13-06	
28	4.51-05	3.75-05	3.15-05	2.67-05	2.28-05	1.96-05	1.70-05	1.47-05	1.28-05	1.11-05	9.49-06	7.67-06		
27	5.08-05	4.23-05	3.55-05	3.01-05	2.57-05	2.20-05	1.90-05	1.64-05	1.41-05	1.20-05	9.70-06			
26	5.75-05	4.78-05	4.01-05	3.40-05	2.89-05	2.48-05	2.13-05	1.82-05	1.55-05	1.24-05				
25	6.54-05	5.44-05	4.56-05	3.85-05	3.27-05	2.79-05	2.38-05	2.00-05	1.60-05					
24	7.49-05	6.22-05	5.20-05	4.39-05	3.71-05	3.14-05	2.63-05	2.09-05						
23	8.63-05	7.15-05	5.97-05	5.01-05	4.21-05	3.50-05	2.76-05							
22	1.00-04	8.27-05	6.88-05	5.73-05	4.73-05	3.71-05								
21	1.17-04	9.62-05	7.94-05	6.50-05	5.05-05									
20	1.37-04	1.12-04	9.10-05	7.01-05										
19	1.62-04	1.30-04	9.93-05											
18	1.90-04	1.44-04												
17	2.14-04													

HE + TE = 5.00+03 NE = 1.00+12 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.00-31	-7.78-38	-5.77-37	-1.52-36	-1.98-36	3.77-36	3.16-35	9.49-35	1.87-34	2.97-34	4.22-34	5.67-34	7.35-34	9.33-34
45	9.61-31	-1.12-37	-8.19-37	-2.17-36	-2.93-36	4.86-36	4.36-35	1.33-34	2.63-34	4.22-34	6.06-34	8.20-34	1.07-33	1.38-33
40	1.37-30	-1.72-37	-1.22-36	-3.28-36	-4.64-36	6.24-36	6.25-35	1.94-34	3.90-34	6.32-34	9.19-34	1.26-33	1.67-33	2.18-33
35	2.05-30	-2.82-37	-1.95-36	-5.33-36	-7.98-36	7.71-36	9.40-35	3.01-34	6.18-34	1.02-33	1.51-33	2.11-33	2.86-33	3.81-33
30	3.28-30	-5.13-37	-3.43-36	-9.58-36	-1.55-35	7.73-36	1.50-34	5.08-34	1.07-33	1.82-33	2.78-33	4.01-33	5.64-33	7.83-33
29	3.63-30	-5.68-37	-3.89-36	-1.09-35	-1.81-35	7.09-36	1.67-34	5.71-34	1.22-33	2.08-33	3.20-33	4.67-33	6.63-33	9.32-33
28	4.04-30	-6.78-37	-4.45-36	-1.26-35	-2.12-35	6.00-36	1.85-34	6.46-34	1.39-33	2.40-33	3.73-33	5.49-33	7.89-33	1.12-32
27	4.51-30	-7.88-37	-5.12-36	-1.46-35	-2.51-35	4.25-36	2.07-34	7.34-34	1.60-33	2.79-33	4.37-33	6.52-33	9.50-33	1.38-32
26	5.06-30	-9.22-37	-5.93-36	-1.71-35	-2.99-35	1.53-36	2.31-34	8.40-34	1.85-33	3.27-33	5.19-33	7.85-33	1.16-32	1.72-32
25	5.70-30	-1.09-36	-6.94-36	-2.01-35	-3.61-35	-2.59-36	2.60-34	9.68-34	2.17-33	3.88-33	6.24-33	9.60-33	1.45-32	2.19-32
24	6.46-30	-1.30-36	-8.18-36	-2.39-35	-4.41-35	-8.80-36	2.92-34	1.12-33	2.56-33	4.65-33	7.62-33	1.19-32	1.85-32	2.87-32
23	7.36-30	-1.56-36	-9.74-36	-2.88-35	-5.45-35	-1.81-35	3.29-34	1.32-33	3.06-33	5.66-33	9.46-33	1.52-32	2.41-32	3.89-32
22	8.43-30	-1.90-36	-1.17-35	-3.51-35	-6.83-35	-3.22-35	3.72-34	1.56-33	3.71-33	7.01-33	1.20-32	1.98-32	3.27-32	5.50-32
21	9.72-30	-2.34-36	-1.43-35	-4.33-35	-8.70-35	-5.35-35	4.19-34	1.86-33	4.56-33	8.85-33	1.56-32	2.67-32	4.61-32	8.22-32
20	1.13-29	-2.92-36	-1.77-35	-5.43-35	-1.13-34	-8.58-35	4.72-34	2.25-33	5.72-33	1.15-32	2.10-32	3.76-32	6.88-32	1.33-31
19	1.32-29	-3.70-36	-2.22-35	-6.93-35	-1.49-34	-1.37-34	5.24-34	2.77-33	7.33-33	1.53-32	2.94-32	5.59-32	1.11-31	2.42-31
18	1.56-29	-4.78-36	-2.84-35	-9.04-35	-2.02-34	-2.19-34	5.67-34	3.44-33	9.64-33	2.12-32	4.34-32	8.96-32	2.00-31	5.24-31
17	1.87-29	-6.29-36	-3.71-35	-1.21-34	-2.81-34	-3.55-34	5.77-34	4.36-33	1.31-32	3.09-32	6.88-32	1.60-31	4.31-31	1.58-30
16	2.25-29	-8.47-36	-4.97-35	-1.65-34	-4.04-34	-5.87-34	4.97-34	5.60-33	1.86-32	4.83-32	1.22-31	3.41-31	1.28-30	1.05-29
15	2.76-29	-1.17-35	-6.83-35	-2.34-34	-6.03-34	-1.00-33	1.87-34	7.29-33	2.80-32	8.33-32	2.54-31	1.00-30	8.43-30	
14	3.43-29	-1.65-35	-9.68-35	-3.44-34	-9.40-34	-1.79-33	-7.09-34	9.48-33	4.56-32	1.68-31	7.28-31	6.44-30		
13	4.33-29	-2.40-35	-1.42-34	-5.25-34	-1.54-33	-3.38-33	-3.22-33	1.16-32	8.37-32	4.55-31	4.48-30			
12	5.60-29	-3.57-35	-2.14-34	-8.38-34	-2.68-33	-6.85-33	-1.07-32	8.98-33	1.89-31	2.54-30				
11	7.42-29	-5.37-35	-3.33-34	-1.40-33	-4.97-33	-1.53-32	-3.63-32	-3.74-32	6.82-31					
10	1.02-28	-7.95-35	-5.21-34	-2.40-33	-9.92-33	-3.93-32	-1.54-31	-7.79-31						
9	1.45-28	-1.09-34	-7.84-34	-4.13-33	-2.13-32	-1.26-31	-1.26-30							
8	2.17-28	-1.22-34	-1.05-33	-6.83-33	-5.13-32	-7.29-31								
7	3.50-28	-1.02-34	-1.28-33	-1.19-32	-2.08-31									
6	6.29-28	-4.53-35	-1.76-33	-3.82-32										
5	1.35-27	1.31-34	-4.35-33											
4	4.03-27	1.59-33												
3	2.92-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.17-33	1.45-33	1.78-33	2.18-33	2.66-33	3.24-33	3.93-33	4.76-33	5.77-33	7.00-33	8.49-33	1.03-32	1.26-32	1.54-32
45	1.74-33	2.18-33	2.72-33	3.38-33	4.19-33	5.19-33	6.42-33	7.95-33	9.87-33	1.23-32	1.53-32	1.92-32	2.43-32	3.09-32
40	2.80-33	3.57-33	4.54-33	5.77-33	7.33-33	9.34-33	1.19-32	1.53-32	1.97-32	2.56-32	3.35-32	4.45-32	5.99-32	8.22-32
35	5.02-33	6.60-33	8.68-33	1.14-32	1.52-32	2.03-32	2.73-32	3.73-32	5.18-32	7.34-32	1.07-31	1.61-31	2.52-31	4.20-31
30	1.08-32	1.50-32	2.10-32	2.98-32	4.30-32	6.37-32	9.72-32	1.55-31	2.60-31	4.74-31	9.67-31	2.37-30	8.12-30	6.18-29
29	1.31-32	1.84-32	2.63-32	3.81-32	5.66-32	8.69-32	1.39-31	2.34-31	4.27-31	8.75-31	2.15-30	7.37-30	5.62-29	
28	1.60-32	2.30-32	3.36-32	5.02-32	7.72-32	1.24-31	2.10-31	3.84-31	7.88-31	1.94-30	6.67-30	5.10-29		
27	2.00-32	2.94-32	4.42-32	6.83-32	1.10-31	1.87-31	3.44-31	7.08-31	1.75-30	6.02-30	4.61-29			
26	2.55-32	3.87-32	6.01-32	9.72-32	1.66-31	3.06-31	6.33-31	1.57-30	5.41-30	4.15-29				
25	3.35-32	5.25-32	8.54-32	1.47-31	2.71-31	5.63-31	1.40-30	4.84-30	3.72-29					
24	4.55-32	7.45-32	1.29-31	2.39-31	4.97-31	1.24-30	4.31-30	3.32-29						
23	6.44-32	1.12-31	2.09-31	4.38-31	1.10-30	3.83-30	2.96-29							
22	9.66-32	1.82-31	3.83-31	9.63-31	3.37-30	2.62-29								
21	1.57-31	3.32-31	8.40-31	2.96-30	2.31-29									
20	2.86-31	7.29-31	2.58-30	2.02-29										
19	6.23-31	2.22-30	1.75-29											
18	1.89-30	1.50-29												
17	1.27-29													

HE + TE = 5.00+03 NE = 1.00+13 CASE B NC = 20

TOTAL RC = 2.799-11 4-3 RC = 4.601-12 4-3 EM = 1.950-23 2S RC = 5.930-12 2P RC = 2.206-11

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.22-03	3.73-04	1.60-04	8.30-05	4.84-05	3.07-05	2.06-05	1.45-05	1.06-05	8.01-06	6.18-06	4.87-06	3.90-06	3.18-06
45	1.69-03	5.17-04	2.22-04	1.15-04	6.72-05	4.26-05	2.86-05	2.02-05	1.47-05	1.11-05	8.57-06	6.75-06	5.41-06	4.40-06
40	2.44-03	7.49-04	3.22-04	1.67-04	9.72-05	6.16-05	4.14-05	2.92-05	2.13-05	1.61-05	1.24-05	9.76-06	7.82-06	6.36-06
35	3.73-03	1.14-03	4.92-04	2.55-04	1.49-04	9.41-05	6.33-05	4.46-05	3.26-05	2.45-05	1.89-05	1.49-05	1.19-05	9.70-06
30	6.15-03	1.89-03	8.10-04	4.20-04	2.45-04	1.55-04	1.04-04	7.33-05	5.36-05	4.03-05	3.11-05	2.45-05	1.96-05	1.59-05
29	6.87-03	2.11-03	9.06-04	4.69-04	2.73-04	1.73-04	1.16-04	8.19-05	5.99-05	4.50-05	3.47-05	2.73-05	2.19-05	1.78-05
28	7.72-03	2.37-03	1.02-03	5.27-04	3.07-04	1.94-04	1.31-04	9.20-05	6.72-05	5.05-05	3.89-05	3.06-05	2.45-05	1.99-05
27	8.72-03	2.67-03	1.15-03	5.94-04	3.46-04	2.19-04	1.47-04	1.04-04	7.58-05	5.70-05	4.39-05	3.45-05	2.76-05	2.24-05
26	9.89-03	3.03-03	1.30-03	6.74-04	3.92-04	2.49-04	1.67-04	1.18-04	8.59-05	6.46-05	4.98-05	3.91-05	3.13-05	2.54-05
25	1.13-02	3.46-03	1.49-03	7.70-04	4.49-04	2.84-04	1.91-04	1.34-04	9.80-05	7.37-05	5.68-05	4.46-05	3.57-05	2.90-05
24	1.30-02	3.98-03	1.71-03	8.85-04	5.16-04	3.26-04	2.19-04	1.54-04	1.13-04	8.46-05	6.52-05	5.12-05	4.09-05	3.32-05
23	1.50-02	4.61-03	1.98-03	1.02-03	5.97-04	3.78-04	2.54-04	1.79-04	1.30-04	9.79-05	7.53-05	5.92-05	4.73-05	3.83-05
22	1.76-02	5.38-03	2.31-03	1.20-03	6.97-04	4.41-04	2.96-04	2.08-04	1.52-04	1.14-04	8.78-05	6.89-05	5.50-05	4.45-05
21	2.07-02	6.35-03	2.72-03	1.41-03	8.21-04	5.19-04	3.49-04	2.45-04	1.79-04	1.34-04	1.03-04	8.09-05	6.45-05	5.21-05
20	2.47-02	7.56-03	3.24-03	1.68-03	9.77-04	6.18-04	4.15-04	2.91-04	2.12-04	1.59-04	1.22-04	9.59-05	7.64-05	6.16-05
19	2.97-02	9.11-03	3.91-03	2.02-03	1.18-03	7.44-04	4.99-04	3.51-04	2.55-04	1.92-04	1.47-04	1.15-04	9.13-05	7.33-05
18	3.63-02	1.11-02	4.78-03	2.47-03	1.44-03	9.08-04	6.09-04	4.28-04	3.11-04	2.33-04	1.79-04	1.39-04	1.10-04	8.79-05
17	4.51-02	1.38-02	5.93-03	3.06-03	1.78-03	1.13-03	7.55-04	5.30-04	3.85-04	2.88-04	2.20-04	1.71-04	1.34-04	1.05-04
16	5.71-02	1.75-02	7.50-03	3.87-03	2.25-03	1.42-03	9.52-04	6.67-04	4.84-04	3.61-04	2.75-04	2.12-04	1.64-04	1.21-04
15	7.39-02	2.26-02	9.69-03	5.00-03	2.91-03	1.83-03	1.23-03	8.59-04	6.22-04	4.62-04	3.49-04	2.65-04	1.92-04	
14	9.81-02	3.00-02	1.29-02	6.63-03	3.85-03	2.43-03	1.62-03	1.13-03	8.16-04	6.02-04	4.47-04	3.19-04		
13	1.34-01	4.11-02	1.76-02	9.07-03	5.26-03	3.31-03	2.20-03	1.53-03	1.10-03	7.95-04	5.56-04			
12	1.91-01	5.83-02	2.49-02	1.28-02	7.44-03	4.67-03	3.10-03	2.14-03	1.50-03	1.03-03				
11	2.83-01	8.64-02	3.69-02	1.90-02	1.10-02	6.85-03	4.52-03	3.06-03	2.03-03					
10	4.40-01	1.34-01	5.73-02	2.94-02	1.69-02	1.05-02	6.80-03	4.34-03						
9	7.18-01	2.19-01	9.31-02	4.76-02	2.72-02	1.66-02	1.01-02							
8	1.19+00	3.63-01	1.54-01	7.80-02	4.38-02	2.51-02								
7	1.85+00	5.60-01	2.36-01	1.17-01	6.20-02									
6	2.30+00	6.91-01	2.86-01	1.34-01										
5	2.54+00	7.51-01	2.93-01											
4	3.59+00	1.00+00												
3	8.11+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.62-06	2.18-06	1.84-06	1.57-06	1.34-06	1.16-06	1.01-06	8.84-07	7.78-07	6.88-07	6.12-07	5.46-07	4.89-07	4.40-07
45	3.63-06	3.03-06	2.55-06	2.17-06	1.86-06	1.61-06	1.40-06	1.22-06	1.08-06	9.52-07	8.46-07	7.55-07	6.76-07	6.08-07
40	5.24-06	4.37-06	3.69-06	3.13-06	2.69-06	2.32-06	2.02-06	1.76-06	1.55-06	1.37-06	1.22-06	1.08-06	9.71-07	8.72-07
35	8.00-06	6.67-06	5.61-06	4.77-06	4.09-06	3.53-06	3.06-06	2.68-06	2.35-06	2.07-06	1.84-06	1.63-06	1.46-06	1.30-06
30	1.31-05	1.09-05	9.18-06	7.79-06	6.67-06	5.74-06	4.97-06	4.33-06	3.79-06	3.32-06	2.91-06	2.55-06	2.20-06	1.79-06
29	1.46-05	1.22-05	1.02-05	8.69-06	7.43-06	6.39-06	5.53-06	4.81-06	4.19-06	3.66-06	3.19-06	2.74-06	2.23-06	
28	1.64-05	1.36-05	1.15-05	9.73-06	8.31-06	7.14-06	6.17-06	5.35-06	4.65-06	4.03-06	3.45-06	2.79-06		
27	1.85-05	1.54-05	1.29-05	1.09-05	9.33-06	8.01-06	6.90-06	5.96-06	5.14-06	4.46-06	3.53-06			
26	2.09-05	1.74-05	1.46-05	1.23-05	1.05-05	9.01-06	7.73-06	6.63-06	5.62-06	4.50-06				
25	2.38-05	1.98-05	1.66-05	1.40-05	1.19-05	1.02-05	8.65-06	7.29-06	5.81-06					
24	2.73-05	2.26-05	1.89-05	1.60-05	1.35-05	1.14-05	9.58-06	7.60-06						
23	3.14-05	2.60-05	2.17-05	1.83-05	1.53-05	1.28-05	1.01-05							
22	3.65-05	3.01-05	2.51-05	2.09-05	1.72-05	1.35-05								
21	4.26-05	3.51-05	2.90-05	2.37-05	1.84-05									
20	5.01-05	4.10-05	3.32-05	2.56-05										
19	5.92-05	4.76-05	3.63-05											
18	6.98-05	5.27-05												
17	7.86-05													

HE + TE = 5.00+03 NE = 1.00+13 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.76-30	2.33-37	8.70-37	5.18-36	2.65-35	8.13-35	1.54-34	2.32-34	3.15-34	4.09-34	5.20-34	6.52-34	8.11-34	1.00-33
45	2.42-30	3.16-37	1.18-36	7.10-36	3.67-35	1.13-34	2.16-34	3.26-34	4.46-34	5.83-34	7.47-34	9.45-34	1.19-33	1.48-33
40	3.45-30	4.41-37	1.64-36	1.01-35	5.29-35	1.65-34	3.17-34	4.82-34	6.64-34	8.78-34	1.14-33	1.46-33	1.85-33	2.34-33
35	5.16-30	6.39-37	2.38-36	1.50-35	8.03-35	2.53-34	4.93-34	7.60-34	1.06-33	1.42-33	1.87-33	2.44-33	3.17-33	4.11-33
30	8.24-30	9.63-37	3.58-36	2.37-35	1.31-34	4.21-34	8.36-34	1.31-33	1.88-33	2.58-33	3.49-33	4.69-33	6.31-33	8.51-33
29	9.13-30	1.05-36	3.90-36	2.62-35	1.46-34	4.72-34	9.42-34	1.49-33	2.14-33	2.96-33	4.03-33	5.47-33	7.43-33	1.01-32
28	1.02-29	1.15-36	4.25-36	2.90-35	1.63-34	5.32-34	1.07-33	1.70-33	2.45-33	3.42-33	4.70-33	6.44-33	8.85-33	1.22-32
27	1.13-29	1.26-36	4.64-36	3.22-35	1.83-34	6.03-34	1.22-33	1.95-33	2.83-33	3.99-33	5.53-33	7.67-33	1.07-32	1.50-32
26	1.27-29	1.38-36	5.07-36	3.60-35	2.07-34	6.87-34	1.40-33	2.25-33	3.31-33	4.70-33	6.60-33	9.27-33	1.31-32	1.88-32
25	1.43-29	1.51-36	5.53-36	4.03-35	2.36-34	7.88-34	1.61-33	2.62-33	3.90-33	5.59-33	7.96-33	1.14-32	1.64-32	2.40-32
24	1.62-29	1.65-36	6.03-36	4.52-35	2.69-34	9.10-34	1.88-33	3.09-33	4.64-33	6.76-33	9.77-33	1.42-32	2.10-32	3.16-32
23	1.85-29	1.80-36	6.56-36	5.10-35	3.10-34	1.06-33	2.22-33	3.68-33	5.60-33	8.28-33	1.22-32	1.82-32	2.75-32	4.30-32
22	2.12-29	1.96-36	7.09-36	5.77-35	3.59-34	1.25-33	2.64-33	4.45-33	6.87-33	1.03-32	1.56-32	2.38-32	3.74-32	6.10-32
21	2.44-29	2.13-36	7.58-36	6.55-35	4.19-34	1.48-33	3.18-33	5.45-33	8.58-33	1.32-32	2.05-32	3.24-32	5.31-32	9.18-32
20	2.84-29	2.28-36	7.99-36	7.45-35	4.94-34	1.78-33	3.90-33	6.80-33	1.09-32	1.73-32	2.78-32	4.59-32	7.99-32	1.50-31
19	3.33-29	2.41-36	8.17-36	8.49-35	5.88-34	2.17-33	4.85-33	8.66-33	1.43-32	2.35-32	3.94-32	6.90-32	1.30-31	2.74-31
18	3.93-29	2.46-36	7.91-36	9.66-35	7.08-34	2.69-33	6.17-33	1.13-32	1.94-32	3.33-32	5.91-32	1.12-31	2.37-31	6.01-31
17	4.69-29	2.36-36	6.79-36	1.05-34	8.63-34	3.40-33	8.05-33	1.53-32	2.75-32	4.98-32	9.59-32	2.04-31	5.20-31	1.84-30
16	5.67-29	1.96-36	4.04-36	1.22-34	1.06-33	4.39-33	1.08-32	2.16-32	4.10-32	8.07-32	1.74-31	4.47-31	1.59-30	1.25-29
15	6.94-29	1.01-36	-1.82-36	1.32-34	1.33-33	5.84-33	1.52-32	3.21-32	6.62-32	1.46-31	3.80-31	1.36-30	1.08-29	
14	8.62-29	-1.02-36	-1.38-35	1.31-34	1.69-33	8.04-33	2.23-32	5.15-32	1.20-31	3.18-31	1.15-30	9.20-30		
13	1.09-28	-5.18-36	-3.79-35	1.02-34	2.17-33	1.16-32	3.54-32	9.21-32	2.58-31	9.59-31	7.75-30			
12	1.41-28	-1.37-35	-8.78-35	-2.15-36	2.79-33	1.76-32	6.20-32	1.96-31	7.69-31	6.38-30				
11	1.87-28	-3.13-35	-1.95-34	-3.10-34	3.43-33	2.90-32	1.28-31	5.71-31	5.02-30					
10	2.55-28	-6.89-35	-4.38-34	-1.20-33	3.33-33	5.32-32	3.50-31	3.58-30						
9	3.64-28	-1.52-34	-1.02-33	-3.96-33	-2.12-33	1.14-31	1.95-30							
8	5.46-28	-3.29-34	-2.50-33	-1.34-32	-4.58-32	2.74-31								
7	8.81-28	-6.43-34	-6.05-33	-5.06-32	-5.73-31									
6	1.58-27	-9.14-34	-1.32-32	-2.74-31										
5	3.39-27	-8.19-34	-3.77-32											
4	1.01-26	1.08-33												
3	7.34-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.23-33	1.51-33	1.84-33	2.23-33	2.71-33	3.29-33	3.98-33	4.81-33	5.82-33	7.05-33	8.55-33	1.04-32	1.27-32	1.55-32
45	1.84-33	2.28-33	2.81-33	3.47-33	4.28-33	5.28-33	6.51-33	8.05-33	9.96-33	1.24-32	1.54-32	1.94-32	2.44-32	3.10-32
40	2.96-33	3.73-33	4.70-33	5.93-33	7.50-33	9.51-33	1.21-32	1.55-32	1.99-32	2.58-32	3.38-32	4.48-32	6.03-32	8.27-32
35	5.33-33	6.92-33	9.01-33	1.18-32	1.55-32	2.07-32	2.78-32	3.79-32	5.24-32	7.42-32	1.08-31	1.62-31	2.54-31	4.23-31
30	1.15-32	1.58-32	2.19-32	3.08-32	4.43-32	6.52-32	9.91-32	1.57-31	2.64-31	4.80-31	9.79-31	2.40-30	8.20-30	6.24-29
29	1.40-32	1.94-32	2.74-32	3.95-32	5.83-32	8.90-32	1.42-31	2.38-31	4.34-31	8.87-31	2.18-30	7.46-30	5.68-29	
28	1.71-32	2.43-32	3.51-32	5.20-32	7.96-32	1.27-31	2.14-31	3.91-31	8.01-31	1.97-30	6.76-30	5.16-29		
27	2.14-32	3.11-32	4.62-32	7.10-32	1.14-31	1.92-31	3.52-31	7.22-31	1.78-30	6.11-30	4.67-29			
26	2.74-32	4.09-32	6.30-32	1.01-31	1.72-31	3.15-31	6.48-31	1.60-30	5.51-30	4.22-29				
25	3.60-32	5.57-32	8.97-32	1.53-31	2.81-31	5.80-31	1.43-30	4.95-30	3.80-29					
24	4.90-32	7.93-32	1.35-31	2.50-31	5.17-31	1.28-30	4.44-30	3.41-29						
23	6.97-32	1.19-31	2.21-31	4.59-31	1.14-30	3.96-30	3.05-29							
22	1.05-31	1.95-31	4.06-31	1.01-30	3.52-30	2.72-29								
21	1.71-31	3.57-31	8.94-31	3.12-30	2.41-29									
20	3.14-31	7.87-31	2.75-30	2.14-29										
19	6.89-31	2.42-30	1.88-29											
18	2.11-30	1.65-29												
17	1.44-29													

HE + TE = 7.50+03 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 1.893-12 4-3 RC = 4.753-13 4-3 EM = 2.014-24 2S RC = 4.859-13 2P RC = 1.407-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.44-04	3.31-04	1.82-04	1.15-04	7.87-05	5.67-05	4.24-05	3.26-05	2.56-05	2.05-05	1.66-05	1.37-05	1.14-05	9.63-06
45	1.12-03	4.42-04	2.44-04	1.55-04	1.07-04	7.72-05	5.79-05	4.46-05	3.51-05	2.82-05	2.29-05	1.89-05	1.58-05	1.33-05
40	1.56-03	6.17-04	3.43-04	2.19-04	1.51-04	1.09-04	8.22-05	6.34-05	5.00-05	4.02-05	3.28-05	2.71-05	2.26-05	1.91-05
35	2.29-03	9.09-04	5.06-04	3.24-04	2.24-04	1.63-04	1.23-04	9.48-05	7.49-05	6.03-05	4.92-05	4.07-05	3.40-05	2.87-05
30	3.57-03	1.42-03	7.96-04	5.12-04	3.55-04	2.58-04	1.95-04	1.51-04	1.20-04	9.65-05	7.89-05	6.54-05	5.47-05	4.63-05
29	3.94-03	1.57-03	8.80-04	5.66-04	3.93-04	2.86-04	2.16-04	1.68-04	1.33-04	1.07-04	8.76-05	7.26-05	6.08-05	5.14-05
28	4.37-03	1.74-03	9.76-04	6.28-04	4.36-04	3.18-04	2.40-04	1.87-04	1.48-04	1.19-04	9.77-05	8.09-05	6.78-05	5.73-05
27	4.85-03	1.94-03	1.09-03	7.00-04	4.86-04	3.55-04	2.68-04	2.08-04	1.65-04	1.33-04	1.09-04	9.06-05	7.59-05	6.42-05
26	5.42-03	2.16-03	1.21-03	7.83-04	5.45-04	3.98-04	3.01-04	2.34-04	1.86-04	1.50-04	1.23-04	1.02-04	8.54-05	7.22-05
25	6.07-03	2.43-03	1.36-03	8.80-04	6.13-04	4.48-04	3.39-04	2.64-04	2.10-04	1.69-04	1.39-04	1.15-04	9.66-05	8.17-05
24	6.85-03	2.74-03	1.54-03	9.94-04	6.93-04	5.07-04	3.85-04	2.99-04	2.38-04	1.92-04	1.58-04	1.31-04	1.10-04	9.29-05
23	7.73-03	3.10-03	1.74-03	1.13-03	7.88-04	5.78-04	4.38-04	3.42-04	2.72-04	2.20-04	1.80-04	1.50-04	1.26-04	1.06-04
22	8.80-03	3.53-03	1.99-03	1.29-03	9.01-04	6.62-04	5.03-04	3.92-04	3.12-04	2.53-04	2.08-04	1.73-04	1.45-04	1.22-04
21	1.01-02	4.05-03	2.28-03	1.48-03	1.04-03	7.63-04	5.81-04	4.53-04	3.61-04	2.93-04	2.41-04	2.00-04	1.68-04	1.42-04
20	1.16-02	4.67-03	2.64-03	1.72-03	1.20-03	8.87-04	6.76-04	5.28-04	4.22-04	3.42-04	2.81-04	2.34-04	1.96-04	1.65-04
19	1.35-02	5.43-03	3.08-03	2.01-03	1.41-03	1.04-03	7.93-04	6.21-04	4.97-04	4.03-04	3.32-04	2.76-04	2.31-04	1.94-04
18	1.58-02	6.36-03	3.62-03	2.36-03	1.66-03	1.23-03	9.41-04	7.38-04	5.91-04	4.81-04	3.96-04	3.29-04	2.74-04	2.28-04
17	1.86-02	7.53-03	4.29-03	2.81-03	1.99-03	1.47-03	1.13-03	8.87-04	7.11-04	5.79-04	4.77-04	3.95-04	3.27-04	2.65-04
16	2.22-02	9.00-03	5.15-03	3.38-03	2.40-03	1.78-03	1.37-03	1.08-03	8.68-04	7.07-04	5.81-04	4.78-04	3.87-04	2.87-04
15	2.68-02	1.09-02	6.26-03	4.13-03	2.96-03	2.19-03	1.69-03	1.34-03	1.07-03	8.76-04	7.17-04	5.78-04	4.28-04	
14	3.27-02	1.34-02	7.72-03	5.12-03	3.66-03	2.74-03	2.12-03	1.68-03	1.36-03	1.10-03	8.84-04	6.55-04		
13	4.07-02	1.67-02	9.68-03	6.46-03	4.64-03	3.49-03	2.72-03	2.16-03	1.74-03	1.39-03	1.03-03			
12	5.14-02	2.12-02	1.24-02	8.33-03	6.03-03	4.57-03	3.57-03	2.85-03	2.27-03	1.68-03				
11	6.65-02	2.76-02	1.63-02	1.10-02	8.06-03	6.16-03	4.84-03	3.84-03	2.86-03					
10	8.82-02	3.70-02	2.21-02	1.51-02	1.12-02	8.63-03	6.79-03	5.07-03						
9	1.21-01	5.14-02	3.11-02	2.17-02	1.63-02	1.27-02	9.51-03							
8	1.73-01	7.48-02	4.63-02	3.30-02	2.53-02	1.91-02								
7	2.63-01	1.16-01	7.42-02	5.47-02	4.15-02									
6	4.31-01	1.98-01	1.33-01	1.01-01										
5	7.97-01	3.90-01	2.82-01											
4	1.81+00	1.00+00												
3	6.19+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.18-06	7.01-06	6.05-06	5.25-06	4.58-06	4.02-06	3.55-06	3.15-06	2.80-06	2.50-06	2.24-06	2.01-06	1.82-06	1.64-06
45	1.13-05	9.70-06	8.37-06	7.27-06	6.35-06	5.58-06	4.92-06	4.36-06	3.88-06	3.46-06	3.10-06	2.78-06	2.51-06	2.26-06
40	1.62-05	1.39-05	1.20-05	1.04-05	9.13-06	8.01-06	7.07-06	6.26-06	5.56-06	4.96-06	4.43-06	3.98-06	3.57-06	3.21-06
35	2.45-05	2.10-05	1.81-05	1.58-05	1.38-05	1.21-05	1.06-05	9.40-06	8.33-06	7.41-06	6.60-06	5.88-06	5.25-06	4.68-06
30	3.94-05	3.38-05	2.92-05	2.53-05	2.21-05	1.93-05	1.70-05	1.49-05	1.31-05	1.15-05	1.00-05	8.67-06	7.31-06	5.69-06
29	4.38-05	3.76-05	3.24-05	2.81-05	2.45-05	2.14-05	1.87-05	1.64-05	1.44-05	1.25-05	1.08-05	9.06-06	7.03-06	
28	4.88-05	4.19-05	3.61-05	3.13-05	2.73-05	2.38-05	2.08-05	1.81-05	1.57-05	1.35-05	1.13-05	8.75-06		
27	5.47-05	4.69-05	4.05-05	3.50-05	3.04-05	2.65-05	2.30-05	1.99-05	1.71-05	1.43-05	1.10-05			
26	6.16-05	5.28-05	4.55-05	3.93-05	3.41-05	2.95-05	2.55-05	2.18-05	1.81-05	1.39-05				
25	6.96-05	5.96-05	5.13-05	4.43-05	3.82-05	3.29-05	2.80-05	2.33-05	1.78-05					
24	7.91-05	6.77-05	5.82-05	5.00-05	4.29-05	3.64-05	3.01-05	2.29-05						
23	9.04-05	7.73-05	6.61-05	5.65-05	4.78-05	3.95-05	2.99-05							
22	1.04-04	8.85-05	7.53-05	6.36-05	5.23-05	3.95-05								
21	1.20-04	1.02-04	8.56-05	7.02-05	5.28-05									
20	1.39-04	1.17-04	9.55-05	7.16-05										
19	1.62-04	1.32-04	9.86-05											
18	1.85-04	1.38-04												
17	1.97-04													

HE + TE = 7.50+03 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	3.29-38	5.62-38	1.28-37	2.73-37	5.26-37	9.26-37	1.52-36	2.35-36	3.49-36	4.99-36	6.91-36	9.34-36	1.23-35
45	0.00+00	4.53-38	7.96-38	1.86-37	4.05-37	7.91-37	1.40-36	2.31-36	3.59-36	5.29-36	7.50-36	1.03-35	1.36-35	1.76-35
40	0.00+00	6.49-38	1.16-37	2.77-37	6.14-37	1.22-36	2.18-36	3.63-36	5.67-36	8.42-36	1.20-35	1.64-35	2.17-35	2.78-35
35	0.00+00	9.79-38	1.79-37	4.34-37	9.79-37	1.97-36	3.59-36	6.05-36	9.59-36	1.44-35	2.08-35	2.89-35	3.86-35	4.97-35
30	0.00+00	1.58-37	2.95-37	7.32-37	1.68-36	3.45-36	6.43-36	1.11-35	1.80-35	2.78-35	4.10-35	5.82-35	7.94-35	1.04-34
29	0.00+00	1.76-37	3.30-37	8.22-37	1.90-36	3.92-36	7.34-36	1.27-35	2.08-35	3.22-35	4.79-35	6.84-35	9.40-35	1.23-34
28	0.00+00	1.96-37	3.70-37	9.28-37	2.16-36	4.47-36	8.42-36	1.47-35	2.42-35	3.77-35	5.65-35	8.13-35	1.12-34	1.48-34
27	0.00+00	2.20-37	4.17-37	1.05-36	2.46-36	5.13-36	9.72-36	1.71-35	2.83-35	4.46-35	6.73-35	9.77-35	1.36-34	1.80-34
26	0.00+00	2.47-37	4.73-37	1.20-36	2.82-36	5.92-36	1.13-35	2.01-35	3.35-35	5.32-35	8.11-35	1.19-34	1.66-34	2.21-34
25	0.00+00	2.80-37	5.39-37	1.38-36	3.26-36	6.90-36	1.33-35	2.37-35	4.00-35	6.43-35	9.90-35	1.46-34	2.07-34	2.74-34
24	0.00+00	3.18-37	6.17-37	1.59-36	3.79-36	8.09-36	1.57-35	2.84-35	4.84-35	7.86-35	1.23-34	1.83-34	2.61-34	3.45-34
23	0.00+00	3.64-37	7.12-37	1.85-36	4.45-36	9.59-36	1.88-35	3.44-35	5.93-35	9.77-35	1.54-34	2.34-34	3.36-34	4.38-34
22	0.00+00	4.20-37	8.28-37	2.17-36	5.27-36	1.15-35	2.28-35	4.22-35	7.39-35	1.24-34	1.99-34	3.05-34	4.40-34	5.55-34
21	0.00+00	4.87-37	9.70-37	2.57-36	6.31-36	1.39-35	2.80-35	5.26-35	9.37-35	1.60-34	2.61-34	4.08-34	5.87-34	6.81-34
20	0.00+00	5.69-37	1.15-36	3.07-36	7.65-36	1.71-35	3.50-35	6.69-35	1.22-34	2.12-34	3.54-34	5.61-34	7.91-34	7.15-34
19	0.00+00	6.71-37	1.37-36	3.72-36	9.40-36	2.13-35	4.45-35	8.70-35	1.62-34	2.90-34	4.97-34	7.95-34	1.04-33	1.09-34
18	0.00+00	8.00-37	1.65-36	4.56-36	1.17-35	2.72-35	5.80-35	1.16-34	2.23-34	4.12-34	7.26-34	1.16-33	1.14-33	-4.46-33
17	0.00+00	9.63-37	2.03-36	5.69-36	1.49-35	3.54-35	7.76-35	1.61-34	3.20-34	6.14-34	1.11-33	1.65-33	-6.44-34	-4.27-32
16	0.00+00	1.18-36	2.52-36	7.23-36	1.94-35	4.75-35	1.08-34	2.32-34	4.84-34	9.75-34	1.79-33	1.68-33	-2.21-32	-7.78-31
15	0.00+00	1.45-36	3.19-36	9.39-36	2.60-35	6.59-35	1.56-34	3.55-34	7.86-34	1.67-33	2.83-33	-7.99-33	-5.07-31	
14	0.00+00	1.83-36	4.12-36	1.25-35	3.61-35	9.56-35	2.40-34	5.85-34	1.41-33	3.13-33	7.94-34	-2.99-31		
13	0.00+00	2.35-36	5.46-36	1.73-35	5.23-35	1.47-34	3.99-34	1.08-33	2.88-33	5.39-33	-1.51-31			
12	0.00+00	3.10-36	7.49-36	2.50-35	8.05-35	2.47-34	7.47-34	2.33-33	6.95-33	-5.30-32				
11	0.00+00	4.21-36	1.07-35	3.82-35	1.35-34	4.65-34	1.67-33	6.56-33	2.56-33					
10	0.00+00	5.93-36	1.61-35	6.33-35	2.54-34	1.06-33	5.14-33	2.70-32						
9	0.00+00	8.79-36	2.62-35	1.18-34	5.84-34	3.42-33	3.10-32							
8	0.00+00	1.39-35	4.76-35	2.69-34	1.92-33	2.44-32								
7	0.00+00	2.44-35	1.04-34	8.74-34	1.48-32									
6	0.00+00	5.01-35	3.19-34	6.79-33										
5	0.00+00	1.38-34	2.29-33											
4	0.00+00	7.80-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.60-35	2.04-35	2.56-35	3.17-35	3.87-35	4.65-35	5.51-35	6.44-35	7.39-35	8.30-35	9.09-35	9.61-35	9.64-35	8.83-35
45	2.21-35	2.71-35	3.23-35	3.74-35	4.16-35	4.40-35	4.29-35	3.60-35	1.95-35	-1.19-35	-6.67-35	-1.57-34	-3.03-34	-5.33-34
40	3.45-35	4.12-35	4.70-35	5.04-35	4.88-35	3.79-35	1.10-35	-4.28-35	-1.41-34	-3.12-34	-6.03-34	-1.09-33	-1.91-33	-3.30-33
35	6.14-35	7.22-35	7.87-35	7.51-35	5.05-35	-1.44-35	-1.54-34	-4.33-34	-9.68-34	-1.98-33	-3.93-33	-7.72-33	-1.54-32	-3.19-32
30	1.29-34	1.46-34	1.40-34	7.52-35	-1.27-34	-6.37-34	-1.84-33	-4.67-33	-1.15-32	-2.91-32	-6.00-32	-2.58-31	-1.14-30	-1.10-29
29	1.53-34	1.71-34	1.53-34	4.13-35	-2.95-34	-1.16-33	-3.31-33	-8.71-33	-2.31-32	-6.60-32	-2.20-31	-9.99-31	-9.92-30	
28	1.82-34	1.99-34	1.58-34	-3.84-35	-6.25-34	-2.20-33	-6.36-33	-1.79-32	-5.34-32	-1.84-31	-8.67-31	-8.90-30		
27	2.20-34	2.30-34	1.42-34	-2.18-34	-1.31-33	-4.41-33	-1.35-32	-4.23-32	-1.52-31	-7.43-31	-7.92-30			
26	2.66-34	2.59-34	7.53-35	-6.27-34	-2.84-33	-9.70-33	-3.26-32	-1.23-31	-6.29-31	-6.99-30				
25	3.23-34	2.71-34	-1.23-34	-1.60-33	-6.62-33	-2.44-32	-9.80-32	-5.24-31	-6.10-30					
24	3.86-34	2.24-34	-6.75-34	-4.16-33	-1.75-32	-7.59-32	-4.30-31	-5.27-30						
23	4.42-34	-1.18-35	-2.27-33	-1.19-32	-5.69-32	-3.45-31	-4.50-30							
22	4.27-34	-8.70-34	-7.43-33	-4.11-32	-2.71-31	-3.78-30								
21	1.01-34	-4.04-33	-2.82-32	-2.07-31	-3.12-30									
20	-1.57-33	-1.79-32	-1.52-31	-2.52-30										
19	-1.01-32	-1.07-31	-1.99-30											
18	-7.07-32	-1.52-30												
17	-1.11-30													

HE + TE = 7.50+03 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 1.897-12 4-3 RC = 4.744-13 4-3 EM = 2.010-24 2S RC = 4.876-13 2P RC = 1.409-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.14-03	4.25-04	2.19-04	1.31-04	8.61-05	6.00-05	4.37-05	3.29-05	2.54-05	2.01-05	1.62-05	1.32-05	1.09-05	9.14-06
45	1.33-03	5.13-04	2.74-04	1.69-04	1.13-04	8.01-05	5.90-05	4.49-05	3.50-05	2.78-05	2.25-05	1.84-05	1.53-05	1.28-05
40	1.71-03	6.67-04	3.64-04	2.29-04	1.56-04	1.12-04	8.32-05	6.37-05	4.99-05	3.99-05	3.24-05	2.67-05	2.22-05	1.87-05
35	2.39-03	9.42-04	5.21-04	3.31-04	2.28-04	1.65-04	1.23-04	9.50-05	7.48-05	6.00-05	4.89-05	4.03-05	3.36-05	2.83-05
30	3.65-03	1.45-03	8.07-04	5.17-04	3.58-04	2.60-04	1.96-04	1.51-04	1.20-04	9.62-05	7.85-05	6.49-05	5.42-05	4.57-05
29	4.01-03	1.60-03	8.91-04	5.71-04	3.96-04	2.88-04	2.17-04	1.68-04	1.33-04	1.07-04	8.72-05	7.21-05	6.02-05	5.08-05
28	4.43-03	1.77-03	9.86-04	6.33-04	4.39-04	3.20-04	2.41-04	1.87-04	1.48-04	1.19-04	9.71-05	8.03-05	6.72-05	5.67-05
27	4.92-03	1.96-03	1.10-03	7.05-04	4.89-04	3.57-04	2.69-04	2.09-04	1.65-04	1.33-04	1.09-04	9.00-05	7.52-05	6.35-05
26	5.48-03	2.19-03	1.22-03	7.88-04	5.48-04	3.99-04	3.02-04	2.34-04	1.85-04	1.49-04	1.22-04	1.01-04	8.46-05	7.14-05
25	6.13-03	2.45-03	1.37-03	8.86-04	6.16-04	4.50-04	3.40-04	2.64-04	2.09-04	1.69-04	1.38-04	1.14-04	9.57-05	8.08-05
24	6.90-03	2.76-03	1.55-03	1.00-03	6.96-04	5.09-04	3.85-04	2.99-04	2.38-04	1.92-04	1.57-04	1.30-04	1.09-04	9.18-05
23	7.80-03	3.12-03	1.76-03	1.14-03	7.92-04	5.79-04	4.39-04	3.41-04	2.71-04	2.19-04	1.79-04	1.49-04	1.24-04	1.05-04
22	8.87-03	3.56-03	2.00-03	1.30-03	9.05-04	6.63-04	5.03-04	3.92-04	3.11-04	2.52-04	2.06-04	1.71-04	1.43-04	1.21-04
21	1.01-02	4.07-03	2.30-03	1.49-03	1.04-03	7.65-04	5.81-04	4.53-04	3.60-04	2.92-04	2.39-04	1.98-04	1.66-04	1.40-04
20	1.17-02	4.70-03	2.66-03	1.73-03	1.21-03	8.89-04	6.76-04	5.28-04	4.20-04	3.41-04	2.79-04	2.32-04	1.94-04	1.63-04
19	1.36-02	5.46-03	3.10-03	2.02-03	1.41-03	1.04-03	7.94-04	6.20-04	4.95-04	4.01-04	3.29-04	2.73-04	2.28-04	1.91-04
18	1.59-02	6.40-03	3.64-03	2.37-03	1.67-03	1.23-03	9.41-04	7.37-04	5.89-04	4.78-04	3.92-04	3.25-04	2.71-04	2.25-04
17	1.87-02	7.57-03	4.32-03	2.82-03	1.99-03	1.47-03	1.13-03	8.85-04	7.08-04	5.75-04	4.72-04	3.90-04	3.23-04	2.63-04
16	2.23-02	9.06-03	5.18-03	3.40-03	2.41-03	1.78-03	1.37-03	1.08-03	8.63-04	7.02-04	5.75-04	4.72-04	3.83-04	2.90-04
15	2.69-02	1.10-02	6.29-03	4.15-03	2.95-03	2.19-03	1.69-03	1.33-03	1.07-03	8.68-04	7.08-04	5.71-04	4.31-04	
14	3.29-02	1.35-02	7.76-03	5.14-03	3.67-03	2.74-03	2.12-03	1.67-03	1.35-03	1.09-03	8.74-04	6.58-04		
13	4.09-02	1.68-02	9.73-03	6.48-03	4.65-03	3.49-03	2.71-03	2.15-03	1.73-03	1.38-03	1.03-03			
12	5.17-02	2.13-02	1.25-02	8.36-03	6.04-03	4.57-03	3.56-03	2.83-03	2.25-03	1.68-03				
11	6.69-02	2.78-02	1.64-02	1.11-02	8.07-03	6.15-03	4.82-03	3.80-03	2.85-03					
10	8.87-02	3.72-02	2.22-02	1.52-02	1.12-02	8.61-03	6.74-03	5.05-03						
9	1.22-01	5.17-02	3.13-02	2.18-02	1.63-02	1.26-02	9.46-03							
8	1.74-01	7.52-02	4.69-02	3.31-02	2.52-02	1.90-02								
7	2.64-01	1.17-01	7.45-02	5.47-02	4.13-02									
6	4.33-01	1.98-01	1.33-01	1.00-01										
5	8.01-01	3.92-01	2.82-01											
4	1.82+00	1.00+00												
3	6.20+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.73-06	6.59-06	5.67-06	4.91-06	4.28-06	3.75-06	3.31-06	2.93-06	2.60-06	2.33-06	2.09-06	1.88-06	1.69-06	1.53-06
45	1.09-05	9.30-06	8.01-06	6.95-06	6.06-06	5.31-06	4.69-06	4.15-06	3.69-06	3.30-06	2.95-06	2.66-06	2.40-06	2.17-06
40	1.58-05	1.36-05	1.17-05	1.01-05	8.84-06	7.76-06	6.84-06	6.06-06	5.38-06	4.80-06	4.30-06	3.86-06	3.47-06	3.13-06
35	2.41-05	2.06-05	1.78-05	1.54-05	1.35-05	1.18-05	1.04-05	9.19-06	8.15-06	7.25-06	6.47-06	5.79-06	5.18-06	4.64-06
30	3.89-05	3.33-05	2.87-05	2.49-05	2.17-05	1.90-05	1.67-05	1.47-05	1.29-05	1.14-05	1.00-05	8.76-06	7.52-06	6.06-06
29	4.32-05	3.70-05	3.19-05	2.77-05	2.41-05	2.10-05	1.84-05	1.62-05	1.42-05	1.25-05	1.09-05	9.30-06	7.46-06	
28	4.82-05	4.13-05	3.56-05	3.08-05	2.68-05	2.34-05	2.05-05	1.79-05	1.56-05	1.36-05	1.16-05	9.26-06		
27	5.40-05	4.63-05	3.98-05	3.45-05	3.00-05	2.61-05	2.27-05	1.98-05	1.71-05	1.45-05	1.16-05			
26	6.08-05	5.20-05	4.48-05	3.87-05	3.36-05	2.91-05	2.53-05	2.18-05	1.84-05	1.46-05				
25	6.87-05	5.88-05	5.05-05	4.36-05	3.77-05	3.25-05	2.79-05	2.36-05	1.86-05					
24	7.81-05	6.67-05	5.73-05	4.93-05	4.24-05	3.62-05	3.04-05	2.39-05						
23	8.92-05	7.61-05	6.52-05	5.58-05	4.75-05	3.97-05	3.11-05							
22	1.02-04	8.72-05	7.43-05	6.30-05	5.25-05	4.09-05								
21	1.18-04	1.00-04	8.46-05	7.02-05	5.44-05									
20	1.37-04	1.15-04	9.53-05	7.35-05										
19	1.60-04	1.31-04	1.01-04											
18	1.84-04	1.41-04												
17	2.00-04													

HE + TE = 7.50+03 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	2.95-38	3.41-38	5.33-38	9.36-38	1.79-37	3.59-37	7.23-37	1.42-36	2.66-36	4.76-36	8.16-36	1.34-35	2.14-35
45	0.00+00	4.42-38	6.58-38	1.33-37	2.67-37	5.09-37	9.26-37	1.62-36	2.74-36	4.51-36	7.22-36	1.13-35	1.73-35	2.61-35
40	0.00+00	6.52-38	1.09-37	2.43-37	5.17-37	1.00-36	1.80-36	3.04-36	4.89-36	7.58-36	1.14-35	1.68-35	2.42-35	3.43-35
35	0.00+00	9.87-38	1.75-37	4.12-37	9.09-37	1.80-36	3.27-36	5.51-36	8.78-36	1.34-35	1.97-35	2.80-35	3.89-35	5.29-35
30	0.00+00	1.59-37	2.93-37	7.15-37	1.62-36	3.30-36	6.11-36	1.05-35	1.69-35	2.61-35	3.86-35	5.51-35	7.62-35	1.02-34
29	0.00+00	1.76-37	3.27-37	8.05-37	1.84-36	3.76-36	7.00-36	1.21-35	1.96-35	3.04-35	4.51-35	6.47-35	8.97-35	1.20-34
28	0.00+00	1.97-37	3.67-37	9.10-37	2.09-36	4.31-36	8.06-36	1.40-35	2.29-35	3.56-35	5.32-35	7.67-35	1.07-34	1.44-34
27	0.00+00	2.20-37	4.15-37	1.03-36	2.39-36	4.96-36	9.34-36	1.63-35	2.69-35	4.21-35	6.34-35	9.20-35	1.29-34	1.74-34
26	0.00+00	2.48-37	4.70-37	1.18-36	2.75-36	5.74-36	1.09-35	1.92-35	3.18-35	5.03-35	7.64-35	1.12-34	1.58-34	2.14-34
25	0.00+00	2.81-37	5.35-37	1.36-36	3.19-36	6.69-36	1.28-35	2.27-35	3.81-35	6.08-35	9.33-35	1.38-34	1.96-34	2.67-34
24	0.00+00	3.19-37	6.14-37	1.57-36	3.71-36	7.87-36	1.52-35	2.73-35	4.61-35	7.45-35	1.16-34	1.73-34	2.49-34	3.39-34
23	0.00+00	3.65-37	7.08-37	1.82-36	4.36-36	9.33-36	1.82-35	3.30-35	5.66-35	9.27-35	1.46-34	2.21-34	3.21-34	4.38-34
22	0.00+00	4.21-37	8.23-37	2.14-36	5.17-36	1.12-35	2.21-35	4.06-35	7.06-35	1.17-34	1.88-34	2.89-34	4.25-34	5.76-34
21	0.00+00	4.88-37	9.65-37	2.54-36	6.19-36	1.36-35	2.72-35	5.07-35	8.96-35	1.52-34	2.48-34	3.89-34	5.77-34	7.63-34
20	0.00+00	5.70-37	1.14-36	3.04-36	7.51-36	1.67-35	3.39-35	6.45-35	1.16-34	2.02-34	3.37-34	5.39-34	8.05-34	9.86-34
19	0.00+00	6.72-37	1.36-36	3.68-36	9.23-36	2.08-35	4.32-35	8.39-35	1.55-34	2.76-34	4.74-34	7.78-34	1.15-33	1.06-33
18	0.00+00	8.01-37	1.65-36	4.51-36	1.15-35	2.66-35	5.63-35	1.12-34	2.14-34	3.93-34	6.99-34	1.17-33	1.59-33	-4.30-34
17	0.00+00	9.65-37	2.02-36	5.63-36	1.47-35	3.46-35	7.54-35	1.55-34	3.07-34	5.89-34	1.09-33	1.83-33	1.57-33	-1.68-32
16	0.00+00	1.18-36	2.51-36	7.15-36	1.91-35	4.64-35	1.05-34	2.24-34	4.65-34	9.43-34	1.82-33	2.75-33	-6.64-33	-3.41-31
15	0.00+00	1.46-36	3.17-36	9.29-36	2.56-35	6.44-35	1.52-34	3.43-34	7.58-34	1.65-33	3.25-33	5.09-34	-2.23-31	
14	0.00+00	1.84-36	4.10-36	1.20-35	3.55-35	9.35-35	2.33-34	5.66-34	1.37-33	3.24-33	4.95-33	-1.28-31		
13	0.00+00	2.36-36	5.44-36	1.[illegible]	5.15-35	1.44-34	3.88-34	1.04-33	2.86-33	7.10-33	-5.61-32			
12	0.00+00	3.11-36	7.46-36	2.[illegible]	7.92-35	2.41-34	7.26-34	2.27-33	7.45-33	-6.94-33				
11	0.00+00	4.22-36	1.06-35	3.[illegible]	1.32-34	4.54-34	1.63-33	6.57-33	2.16-32					
10	0.00+00	5.94-36	1.60-35	6.26-35	2.50-34	1.04-33	5.03-33	3.29-32						
9	0.00+00	8.81-36	2.61-35	1.17-34	5.73-34	3.34-33	3.19-32							
8	0.00+00	1.40-35	4.74-35	2.65-34	1.88-33	2.41-32								
7	0.00+00	2.44-35	1.03-34	8.61-34	1.45-32									
6	0.00+00	5.01-35	3.17-34	6.67-33										
5	0.00+00	1.38-34	2.26-33											
4	0.00+00	7.79-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.32-35	5.01-35	7.40-35	1.07-34	1.53-34	2.16-34	3.00-34	4.14-34	5.66-34	7.69-34	1.04-33	1.40-33	1.87-33	2.51-33
45	3.85-35	5.62-35	8.07-35	1.15-34	1.61-34	2.25-34	3.12-34	4.31-34	5.91-34	8.09-34	1.11-33	1.51-33	2.07-33	2.83-33
40	4.81-35	6.67-35	9.18-35	1.25-34	1.71-34	2.32-34	3.14-34	4.24-34	5.75-34	7.82-34	1.07-33	1.47-33	2.03-33	2.84-33
35	7.06-35	9.26-35	1.19-34	1.51-34	1.89-34	2.30-34	2.72-34	3.07-34	3.18-34	2.70-34	8.82-35	-3.91-34	-1.54-33	-4.26-33
30	1.32-34	1.65-34	1.93-34	2.04-34	1.65-34	1.13-35	-4.09-34	-1.45-33	-3.99-33	-1.05-32	-2.87-32	-8.96-32	-3.73-31	-3.26-30
29	1.56-34	1.91-34	2.17-34	2.08-34	1.10-34	-2.08-34	-1.05-33	-3.21-33	-8.88-33	-2.52-32	-8.09-32	-3.46-31	-3.11-30	
28	1.85-34	2.24-34	2.43-34	1.98-34	-1.68-35	-6.60-34	-2.41-33	-7.21-33	-2.14-32	-7.14-32	-3.14-31	-2.91-30		
27	2.23-34	2.65-34	2.67-34	1.48-34	-3.03-34	-1.65-33	-5.57-33	-1.77-32	-6.14-32	-2.80-31	-2.68-30			
26	2.73-34	3.14-34	2.78-34	3.51-37	-9.78-34	-4.05-33	-1.40-32	-5.15-32	-2.45-31	-2.44-30				
25	3.38-34	3.69-34	2.41-34	-4.03-34	-2.69-33	-1.07-32	-4.21-32	-2.10-31	-2.19-30					
24	4.21-34	4.15-34	1.79-34	-1.53-33	-7.64-33	-3.32-32	-1.77-31	-1.94-30						
23	5.25-34	4.02-34	-5.87-34	-5.03-33	-2.53-32	-1.46-31	-1.69-30							
22	6.33-34	1.41-34	-2.86-33	-1.82-32	-1.16-31	-1.45-30								
21	6.59-34	-1.13-33	-1.22-32	-9.02-32	-1.23-30									
20	1.63-34	-7.26-33	-6.69-32	-1.01-30										
19	-3.34-33	-4.69-32	-8.18-31											
18	-3.02-32	-6.40-31												
17	-4.80-31													

HE + TE = 7.50+03 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 1.904-12 4-3 RC = 4.700-13 4-3 CM = 1.992-24 2S RC = 4.917-13 2P RC = 1.412-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.18-03	7.05-04	3.19-04	1.73-04	1.05-04	6.86-05	4.76-05	3.44-05	2.57-05	1.98-05	1.55-05	1.24-05	1.01-05	8.34-06
45	2.43-03	8.21-04	3.85-04	2.14-04	1.33-04	8.88-05	6.25-05	4.58-05	3.46-05	2.69-05	2.13-05	1.72-05	1.40-05	1.16-05
40	2.69-03	9.60-04	4.73-04	2.74-04	1.76-04	1.20-04	8.61-05	6.41-05	4.91-05	3.85-05	3.07-05	2.50-05	2.06-05	1.71-05
35	3.12-03	1.18-03	6.15-04	3.72-04	2.46-04	1.72-04	1.26-04	9.52-05	7.38-05	5.84-05	4.70-05	3.84-05	3.18-05	2.66-05
30	4.14-03	1.61-03	8.78-04	5.50-04	3.73-04	2.67-04	1.98-04	1.52-04	1.19-04	9.46-05	7.66-05	6.29-05	5.23-05	4.39-05
29	4.46-03	1.75-03	9.57-04	6.03-04	4.11-04	2.95-04	2.19-04	1.68-04	1.32-04	1.05-04	8.53-05	7.01-05	5.83-05	4.89-05
28	4.85-03	1.91-03	1.05-03	6.63-04	4.54-04	3.26-04	2.44-04	1.87-04	1.47-04	1.17-04	9.52-05	7.83-05	6.51-05	5.47-05
27	5.31-03	2.09-03	1.16-03	7.34-04	5.04-04	3.63-04	2.72-04	2.09-04	1.64-04	1.31-04	1.07-04	8.78-05	7.31-05	6.14-05
26	5.84-03	2.31-03	1.28-03	8.16-04	5.62-04	4.06-04	3.04-04	2.34-04	1.84-04	1.48-04	1.20-04	9.89-05	8.23-05	6.92-05
25	6.48-03	2.57-03	1.43-03	9.13-04	6.30-04	4.56-04	3.43-04	2.64-04	2.08-04	1.67-04	1.36-04	1.12-04	9.32-05	7.83-05
24	7.23-03	2.87-03	1.60-03	1.03-03	7.10-04	5.16-04	3.88-04	3.00-04	2.36-04	1.90-04	1.54-04	1.27-04	1.06-04	8.90-05
23	8.12-03	3.23-03	1.81-03	1.16-03	8.06-04	5.86-04	4.42-04	3.42-04	2.70-04	2.17-04	1.77-04	1.46-04	1.21-04	1.02-04
22	9.18-03	3.67-03	2.06-03	1.32-03	9.20-04	6.71-04	5.06-04	3.92-04	3.10-04	2.49-04	2.03-04	1.67-04	1.39-04	1.17-04
21	1.05-02	4.19-03	2.35-03	1.52-03	1.06-03	7.72-04	5.84-04	4.53-04	3.58-04	2.88-04	2.35-04	1.94-04	1.61-04	1.35-04
20	1.20-02	4.82-03	2.71-03	1.76-03	1.23-03	8.97-04	6.79-04	5.27-04	4.18-04	3.37-04	2.75-04	2.26-04	1.88-04	1.57-04
19	1.39-02	5.59-03	3.16-03	2.05-03	1.43-03	1.05-03	7.96-04	6.20-04	4.92-04	3.96-04	3.23-04	2.66-04	2.21-04	1.84-04
18	1.62-02	6.54-03	3.71-03	2.41-03	1.69-03	1.24-03	9.43-04	7.35-04	5.84-04	4.71-04	3.84-04	3.16-04	2.62-04	2.16-04
17	1.91-02	7.73-03	4.39-03	2.87-03	2.01-03	1.48-03	1.13-03	8.82-04	7.01-04	5.66-04	4.61-04	3.79-04	3.11-04	2.52-04
16	2.28-02	9.24-03	5.27-03	3.45-03	2.43-03	1.80-03	1.37-03	1.07-03	8.53-04	6.89-04	5.60-04	4.56-04	3.68-04	2.98-04
15	2.75-02	1.12-02	6.40-03	4.20-03	2.97-03	2.20-03	1.69-03	1.32-03	1.05-03	8.49-04	6.87-04	5.49-04	4.44-04	
14	3.36-02	1.37-02	7.89-03	5.21-03	3.70-03	2.75-03	2.11-03	1.66-03	1.32-03	1.06-03	8.43-04	6.31-04		
13	4.17-02	1.71-02	9.89-03	6.57-03	4.69-03	3.51-03	2.70-03	2.12-03	1.69-03	1.33-03	9.93-04			
12	5.27-02	2.17-02	1.27-02	8.46-03	6.08-03	4.57-03	3.54-03	2.78-03	2.18-03	1.62-03				
11	6.81-02	2.83-02	1.66-02	1.12-02	8.12-03	6.14-03	4.77-03	3.71-03	2.74-03					
10	9.04-02	3.79-02	2.25-02	1.53-02	1.12-02	8.56-03	6.61-03	4.88-03						
9	1.24-01	5.25-02	3.17-02	2.19-02	1.63-02	1.26-02	9.18-03							
8	1.78-01	7.64-02	4.71-02	3.33-02	2.50-02	1.85-02								
7	2.69-01	1.18-01	7.52-02	5.46-02	4.05-02									
6	4.41-01	2.01-01	1.34-01	9.88-02										
5	8.16-01	3.96-01	2.80-01											
4	1.85+00	1.00+00												
3	6.26+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.97-06	5.88-06	5.00-06	4.30-06	3.72-06	3.24-06	2.84-06	2.50-06	2.22-06	1.97-06	1.76-06	1.58-06	1.42-06	1.29-06
45	9.77-06	8.27-06	7.07-06	6.09-06	5.28-06	4.61-06	4.05-06	3.58-06	3.18-06	2.83-06	2.53-06	2.28-06	2.05-06	1.86-06
40	1.44-05	1.23-05	1.05-05	9.09-06	7.90-06	6.91-06	6.08-06	5.38-06	4.77-06	4.26-06	3.81-06	3.42-06	3.08-06	2.79-06
35	2.25-05	1.92-05	1.65-05	1.43-05	1.24-05	1.09-05	9.55-06	8.44-06	7.48-06	6.66-06	5.95-06	5.32-06	4.78-06	4.29-06
30	3.72-05	3.17-05	2.73-05	2.36-05	2.05-05	1.79-05	1.57-05	1.38-05	1.22-05	1.07-05	9.45-06	8.29-06	7.15-06	5.81-06
29	4.14-05	3.54-05	3.04-05	2.62-05	2.28-05	1.99-05	1.74-05	1.53-05	1.34-05	1.18-05	1.03-05	8.85-06	7.17-06	
28	4.63-05	3.95-05	3.39-05	2.93-05	2.54-05	2.22-05	1.94-05	1.69-05	1.48-05	1.29-05	1.10-05	8.90-06		
27	5.20-05	4.44-05	3.81-05	3.29-05	2.85-05	2.47-05	2.16-05	1.88-05	1.63-05	1.39-05	1.11-05			
26	5.86-05	5.00-05	4.28-05	3.69-05	3.19-05	2.77-05	2.40-05	2.07-05	1.76-05	1.41-05				
25	6.63-05	5.65-05	4.84-05	4.16-05	3.59-05	3.09-05	2.66-05	2.25-05	1.79-05					
24	7.53-05	6.41-05	5.48-05	4.70-05	4.04-05	3.45-05	2.90-05	2.30-05						
23	8.60-05	7.31-05	6.24-05	5.32-05	4.53-05	3.79-05	2.99-05							
22	9.88-05	8.37-05	7.11-05	6.01-05	5.01-05	3.93-05								
21	1.14-04	9.61-05	8.09-05	6.71-05	5.23-05									
20	1.32-04	1.10-04	9.10-05	7.06-05										
19	1.53-04	1.26-04	9.68-05											
18	1.76-04	1.35-04												
17	1.92-04													

HE + TE = 7.50+03 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	7.84-39	-5.56-38	-1.97-37	-4.54-37	-8.34-37	-1.29-36	-1.67-36	-1.70-36	-9.41-37	1.32-36	6.08-36	1.48-35	2.94-35
45	0.00+00	2.31-38	-2.77-38	-1.36-37	-3.28-37	-5.87-37	-8.27-37	-8.45-37	-2.73-37	1.49-36	5.35-36	1.27-35	2.53-35	4.60-35
40	0.00+00	4.99-38	2.92-38	-3.86-39	-5.11-38	-6.43-38	8.91-38	6.74-37	2.15-36	5.25-36	1.11-35	2.14-35	3.86-35	6.62-35
35	0.00+00	9.22-38	1.22-37	2.22-37	4.34-37	8.57-37	1.68-36	2.25-36	6.09-36	1.11-35	1.95-35	3.33-35	5.55-35	9.03-35
30	0.00+00	1.59-37	2.65-37	5.87-37	1.26-36	2.49-36	4.61-36	8.07-36	1.36-35	2.21-35	3.52-35	5.51-35	8.51-35	1.31-34
29	0.00+00	1.77-37	3.03-37	6.87-37	1.49-36	2.97-36	5.49-36	9.57-36	1.59-35	2.57-35	4.04-35	6.24-35	9.51-35	1.44-34
28	0.00+00	1.98-37	3.46-37	8.00-37	1.76-36	3.53-36	6.52-36	1.13-35	1.88-35	3.01-35	4.69-35	7.16-35	1.08-34	1.61-34
27	0.00+00	2.22-37	3.95-37	9.30-37	2.07-36	4.18-36	7.76-36	1.35-35	2.23-35	3.56-35	5.50-35	8.32-35	1.24-34	1.82-34
26	0.00+00	2.50-37	4.52-37	1.08-36	2.43-36	4.95-36	9.24-36	1.61-35	2.67-35	4.24-35	6.53-35	9.82-35	1.45-34	2.10-34
25	0.00+00	2.83-37	5.19-37	1.26-36	2.86-36	5.87-36	1.10-35	1.93-35	3.21-35	5.12-35	7.88-35	1.18-34	1.73-34	2.48-34
24	0.00+00	3.22-37	5.97-37	1.47-36	3.38-36	7.00-36	1.33-35	2.34-35	3.91-35	6.25-35	9.65-35	1.44-34	2.10-34	2.97-34
23	0.00+00	3.68-37	6.92-37	1.72-36	4.01-36	8.39-36	1.61-35	2.86-35	4.82-35	7.76-35	1.20-34	1.81-34	2.62-34	3.65-34
22	0.00+00	4.23-37	8.06-37	2.03-36	4.79-36	1.01-35	1.96-35	3.53-35	6.02-35	9.80-35	1.54-34	2.32-34	3.36-34	4.55-34
21	0.00+00	4.90-37	9.45-37	2.42-36	5.77-36	1.24-35	2.43-35	4.43-35	7.65-35	1.26-34	2.01-34	3.06-34	4.41-34	5.72-34
20	0.00+00	5.73-37	1.12-36	2.90-36	7.02-36	1.53-35	3.04-35	5.65-35	9.93-35	1.67-34	2.70-34	4.16-34	5.95-34	6.95-34
19	0.00+00	6.75-37	1.34-36	3.52-36	8.66-36	1.92-35	3.88-35	7.36-35	1.32-34	2.28-34	3.76-34	5.87-34	8.14-34	6.71-34
18	0.00+00	8.04-37	1.62-36	4.33-36	1.08-35	2.45-35	5.07-35	9.84-35	1.82-34	3.22-34	5.47-34	8.61-34	1.07-33	-4.97-34
17	0.00+00	9.68-37	1.98-36	5.41-36	1.38-35	3.19-35	6.79-35	1.36-34	2.60-34	4.78-34	8.38-34	1.30-33	8.85-34	-1.13-32
16	0.00+00	1.18-36	2.46-36	6.88-36	1.80-35	4.28-35	9.42-35	1.96-34	3.92-34	7.56-34	1.37-33	1.83-33	-5.00-33	-1.99-31
15	0.00+00	1.46-36	3.12-36	8.94-36	2.41-35	5.94-35	1.36-34	2.98-34	6.32-34	1.30-33	2.34-33	-1.29-34	-1.37-31	
14	0.00+00	1.84-36	4.03-36	1.19-35	3.35-35	8.62-35	2.09-34	4.89-34	1.12-33	2.47-33	3.22-33	-8.36-32		
13	0.00+00	2.36-36	5.35-36	1.65-35	4.85-35	1.33-34	3.46-34	8.90-34	2.29-33	5.12-33	-3.99-32			
12	0.00+00	3.11-36	7.33-36	2.38-35	7.46-35	2.21-34	6.42-34	1.90-33	5.73-33	-7.08-33				
11	0.00+00	4.23-36	1.05-35	3.64-35	1.24-34	4.14-34	1.42-33	5.33-33	1.43-32					
10	0.00+00	5.96-36	1.58-35	6.02-35	2.34-34	9.35-34	4.28-33	2.46-32						
9	0.00+00	8.83-36	2.56-35	1.12-34	5.32-34	2.96-33	2.57-32							
8	0.00+00	1.40-35	4.65-35	2.53-34	1.73-33	2.05-32								
7	0.00+00	2.45-35	1.01-34	8.16-34	1.29-32									
6	0.00+00	5.02-35	3.08-34	6.22-33										
5	0.00+00	1.38-34	2.18-33											
4	0.00+00	7.76-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.26-35	8.80-35	1.40-34	2.16-34	3.23-34	4.74-34	6.82-34	9.67-34	1.35-33	1.88-33	2.58-33	3.53-33	4.81-33	6.52-33
45	7.85-35	1.28-34	2.01-34	3.08-34	4.62-34	6.80-34	9.88-34	1.42-33	2.02-33	2.86-33	4.03-33	5.66-33	7.95-33	1.12-32
40	1.09-34	1.75-34	2.73-34	4.19-34	6.32-34	9.44-34	1.40-33	2.06-33	3.01-33	4.41-33	6.48-33	9.55-33	1.42-32	2.13-32
35	1.45-34	2.28-34	3.55-34	5.47-34	8.40-34	1.29-33	1.97-33	3.03-33	4.69-33	7.35-33	1.17-32	1.92-32	3.24-32	5.76-32
30	1.99-34	3.05-34	4.67-34	7.20-34	1.12-33	1.78-33	2.87-33	4.79-33	8.33-33	1.54-32	3.14-32	7.52-32	2.49-31	1.89-30
29	2.17-34	3.28-34	4.97-34	7.62-34	1.18-33	1.88-33	3.05-33	5.17-33	9.25-33	1.81-32	4.11-32	1.28-31	9.30-31	
28	2.39-34	3.56-34	5.32-34	8.03-34	1.23-33	1.93-33	3.10-33	5.19-33	9.25-33	1.84-32	4.67-32	2.83-31		
27	2.67-34	3.89-34	5.68-34	8.32-34	1.22-33	1.81-33	2.65-33	3.68-33	3.88-33	-5.66-33	-1.42-31			
26	3.02-34	4.28-34	6.00-34	8.20-34	1.06-33	1.18-33	4.46-34	-4.62-33	-3.69-32	-4.05-31				
25	3.47-34	4.71-34	6.07-34	6.84-34	4.37-34	-1.17-33	-8.92-33	-5.32-32	-5.51-31					
24	4.03-34	5.08-34	5.29-34	1.68-34	-1.73-33	-1.04-32	-5.93-32	-6.18-31						
23	4.70-34	5.02-34	1.78-34	-1.61-33	-1.00-32	-5.84-32	-6.28-31							
22	5.32-34	3.28-34	-1.14-33	-8.54-33	-5.32-32	-6.01-31								
21	5.22-34	-5.06-34	-6.52-33	-4.55-32	-5.50-31									
20	1.28-34	-4.34-33	-3.66-32	-4.85-31										
19	-2.27-33	-2.75-32	-4.13-31											
18	-1.89-32	-3.39-31												
17	-2.67-31													

HE + TE = 7.50+03 NE = 1.00+05 CASE B NC = 70

TOTAL RC = 1.918-12 4-3 RC = 4.627-13 4-3 EM = 1.961-24 2S RC = 4.997-13 2P RC = 1.418-12

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.18-03	9.84-04	4.26-04	2.22-04	1.30-04	8.31-05	5.62-05	3.98-05	2.92-05	2.21-05	1.71-05	1.35-05	1.09-05	8.88-06
45	3.89-03	1.21-03	5.29-04	2.77-04	1.64-04	1.05-04	7.12-05	5.06-05	3.73-05	2.83-05	2.20-05	1.74-05	1.40-05	1.15-05
40	4.83-03	1.53-03	6.75-04	3.59-04	2.14-04	1.38-04	9.49-05	6.79-05	5.04-05	3.84-05	3.00-05	2.39-05	1.93-05	1.59-05
35	5.84-03	1.91-03	8.72-04	4.76-04	2.90-04	1.91-04	1.33-04	9.66-05	7.25-05	5.58-05	4.40-05	3.53-05	2.87-05	2.37-05
30	6.80-03	2.38-03	1.15-03	6.60-04	4.18-04	2.84-04	2.02-04	1.50-04	1.14-04	8.91-05	7.09-05	5.74-05	4.72-05	3.92-05
29	7.02-03	2.50-03	1.23-03	7.12-04	4.55-04	3.11-04	2.23-04	1.65-04	1.27-04	9.91-05	7.91-05	6.41-05	5.27-05	4.39-05
28	7.27-03	2.64-03	1.32-03	7.72-04	4.98-04	3.42-04	2.46-04	1.84-04	1.41-04	1.11-04	8.86-05	7.20-05	5.93-05	4.94-05
27	7.56-03	2.79-03	1.42-03	8.40-04	5.47-04	3.79-04	2.74-04	2.05-04	1.58-04	1.24-04	9.97-05	8.12-05	6.69-05	5.58-05
26	7.93-03	2.97-03	1.53-03	9.21-04	6.04-04	4.21-04	3.07-04	2.31-04	1.78-04	1.40-04	1.13-04	9.19-05	7.59-05	6.33-05
25	8.39-03	3.19-03	1.67-03	1.01-03	6.72-04	4.71-04	3.45-04	2.60-04	2.02-04	1.59-04	1.28-04	1.05-04	8.64-05	7.21-05
24	8.98-03	3.45-03	1.83-03	1.13-03	7.51-04	5.30-04	3.90-04	2.95-04	2.29-04	1.82-04	1.46-04	1.20-04	9.88-05	8.25-05
23	9.71-03	3.77-03	2.03-03	1.26-03	8.46-04	6.01-04	4.43-04	3.37-04	2.63-04	2.08-04	1.68-04	1.37-04	1.14-04	9.48-05
22	1.06-02	4.16-03	2.26-03	1.42-03	9.60-04	6.85-04	5.08-04	3.87-04	3.02-04	2.40-04	1.94-04	1.59-04	1.31-04	1.09-04
21	1.18-02	4.64-03	2.55-03	1.61-03	1.10-03	7.87-04	5.86-04	4.48-04	3.50-04	2.79-04	2.25-04	1.84-04	1.52-04	1.27-04
20	1.33-02	5.24-03	2.90-03	1.84-03	1.26-03	9.11-04	6.80-04	5.22-04	4.09-04	3.26-04	2.64-04	2.16-04	1.78-04	1.48-04
19	1.51-02	5.99-03	3.34-03	2.13-03	1.47-03	1.06-03	7.98-04	6.13-04	4.81-04	3.84-04	3.11-04	2.54-04	2.09-04	1.73-04
18	1.74-02	6.93-03	3.88-03	2.50-03	1.73-03	1.26-03	9.44-04	7.27-04	5.72-04	4.57-04	3.69-04	3.01-04	2.47-04	2.03-04
17	2.03-02	8.12-03	4.58-03	2.96-03	2.06-03	1.50-03	1.13-03	8.72-04	6.86-04	5.48-04	4.43-04	3.60-04	2.93-04	2.36-04
16	2.40-02	9.65-03	5.46-03	3.54-03	2.47-03	1.81-03	1.37-03	1.06-03	8.34-04	6.65-04	5.36-04	4.32-04	3.45-04	2.61-04
15	2.87-02	1.16-02	6.61-03	4.31-03	3.02-03	2.22-03	1.68-03	1.30-03	1.03-03	8.17-04	6.54-04	5.18-04	3.88-04	
14	3.50-02	1.42-02	8.13-03	5.33-03	3.75-03	2.76-03	2.10-03	1.63-03	1.28-03	1.02-03	7.98-04	5.93-04		
13	4.33-02	1.77-02	1.02-02	6.71-03	4.75-03	3.51-03	2.67-03	2.08-03	1.63-03	1.27-03	9.34-04			
12	5.46-02	2.24-02	1.30-02	8.63-03	6.14-03	4.57-03	3.49-03	2.70-03	2.08-03	1.52-03				
11	7.05-02	2.92-02	1.71-02	1.14-02	8.18-03	6.11-03	4.66-03	3.57-03	2.59-03					
10	9.35-02	3.90-02	2.31-02	1.56-02	1.13-02	8.45-03	6.41-03	4.63-03						
9	1.28-01	5.41-02	3.24-02	2.22-02	1.62-02	1.22-02	8.75-03							
8	1.83-01	7.86-02	4.80-02	3.35-02	2.47-02	1.77-02								
7	2.78-01	1.22-01	7.65-02	5.45-02	3.91-02									
6	4.55-01	2.06-01	1.35-01	9.65-02										
5	8.41-01	4.04-01	2.76-01											
4	1.90+00	1.00+00												
3	6.36+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.34-06	6.14-06	5.19-06	4.42-06	3.80-06	3.29-06	2.87-06	2.51-06	2.22-06	1.96-06	1.75-06	1.56-06	1.40-06	1.26-06
45	9.50-06	7.96-06	6.73-06	5.75-06	4.95-06	4.29-06	3.74-06	3.28-06	2.90-06	2.57-06	2.29-06	2.05-06	1.84-06	1.66-06
40	1.32-05	1.11-05	9.40-06	8.04-06	6.94-06	6.02-06	5.25-06	4.63-06	4.09-06	3.63-06	3.24-06	2.90-06	2.60-06	2.35-06
35	1.98-05	1.67-05	1.43-05	1.22-05	1.06-05	9.23-06	8.[illegible]-06	7.12-06	6.30-06	5.60-06	4.99-06	4.47-06	4.01-06	3.60-06
30	3.29-05	2.79-05	2.39-05	2.06-05	1.78-05	1.56-05	1.36-05	1.20-05	1.06-05	9.35-06	8.26-06	7.28-06	6.32-06	5.17-06
29	3.69-05	3.13-05	2.68-05	2.31-05	2.00-05	1.74-05	1.53-05	1.34-05	1.18-05	1.04-05	9.11-06	7.88-06	6.43-06	
28	4.16-05	3.53-05	3.02-05	2.60-05	2.25-05	1.96-05	1.71-05	1.50-05	1.32-05	1.15-05	9.90-06	8.04-06		
27	4.70-05	3.99-05	3.41-05	2.94-05	2.54-05	2.21-05	1.93-05	1.68-05	1.46-05	1.25-05	1.01-05			
26	5.33-05	4.53-05	3.87-05	3.33-05	2.88-05	2.49-05	2.16-05	1.87-05	1.60-05	1.28-05				
25	6.07-05	5.15-05	4.40-05	3.78-05	3.26-05	2.81-05	2.42-05	2.05-05	1.64-05					
24	6.94-05	5.89-05	5.02-05	4.30-05	3.69-05	3.15-05	2.66-05	2.12-05						
23	7.97-05	6.75-05	5.74-05	4.89-05	4.16-05	3.49-05	2.77-05							
22	9.19-05	7.76-05	6.57-05	5.55-05	4.63-05	3.65-05								
21	1.06-04	8.94-05	7.50-05	6.22-05	4.87-05									
20	1.23-04	1.03-04	8.47-05	6.58-05										
19	1.43-04	1.17-04	9.04-05											
18	1.65-04	1.26-04												
17	1.79-04													

HE + TE = 7.50+03 NE = 1.00+05 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.30-38	-1.42-37	-4.49-37	-1.05-36	-2.04-36	-3.51-36	-5.48-36	-7.90-36	-1.06-35	-1.31-35	-1.51-35	-1.56-35	-1.35-35
45	0.00+00	-7.57-39	-1.53-37	-4.90-37	-1.13-36	-2.16-36	-3.59-36	-5.33-36	-7.12-36	-8.44-36	-8.44-36	-5.84-36	1.25-36	1.55-35
40	0.00+00	5.17-39	-1.54-37	-5.15-37	-1.16-36	-2.21-36	-3.53-36	-4.87-36	-5.67-36	-4.93-36	-1.01-36	8.58-36	2.76-35	6.15-35
35	0.00+00	3.82-38	-1.09-37	-4.31-37	-1.01-36	-1.82-36	-2.64-36	-2.96-36	-1.74-36	2.82-36	1.37-35	3.54-35	7.53-35	1.44-34
30	0.00+00	1.16-37	4.48-38	-8.11-38	-2.64-37	-3.51-37	9.21-38	1.98-36	7.03-36	1.82-35	4.06-35	8.26-35	1.58-34	2.90-34
29	0.00+00	1.39-37	9.46-38	3.65-38	-1.24-38	1.38-37	9.78-37	3.52-36	9.62-36	2.26-35	4.80-35	9.53-35	1.80-34	3.29-34
28	0.00+00	1.66-37	1.53-37	1.75-37	2.85-37	7.14-37	2.01-36	5.29-36	1.26-35	2.75-35	5.62-35	1.09-34	2.05-34	3.74-34
27	0.00+00	1.96-37	2.19-37	3.36-37	6.34-37	1.39-36	3.23-36	7.36-36	1.60-35	3.31-35	6.55-35	1.25-34	2.32-34	4.24-34
26	0.00+00	2.30-37	2.94-37	5.21-37	1.04-36	2.19-36	4.67-36	9.80-36	2.00-35	3.96-35	7.62-35	1.43-34	2.64-34	4.82-34
25	0.00+00	2.69-37	3.79-37	7.34-37	1.52-36	3.13-36	6.38-36	1.27-35	2.49-35	4.75-35	8.91-35	1.65-34	3.02-34	5.52-34
24	0.00+00	3.[illegible]-37	4.76-37	9.82-37	2.08-36	4.27-36	8.47-36	1.63-35	3.08-35	5.72-35	1.05-34	1.91-34	3.48-34	6.37-34
23	0.00+00	3.64-37	5.87-37	1.27-36	2.75-36	5.64-36	1.10-35	2.08-35	3.83-35	6.93-35	1.25-34	2.24-34	4.05-34	7.43-34
22	0.00+00	4.24-37	7.16-37	1.61-36	3.55-36	7.33-36	1.42-35	2.65-35	4.80-35	8.53-35	1.51-34	2.67-34	4.80-34	8.82-34
21	0.00+00	4.94-37	8.67-37	2.02-36	4.54-36	9.44-36	1.84-35	3.40-35	6.09-35	1.07-34	1.86-34	3.26-34	5.81-34	1.06-33
20	0.00+00	5.79-37	1.05-36	2.52-36	5.77-36	1.21-35	2.38-35	4.40-35	7.86-35	1.37-34	2.37-34	4.10-34	7.20-34	1.30-33
19	0.00+00	6.83-37	1.27-36	3.13-36	7.34-36	1.57-35	3.10-35	5.80-35	1.04-34	1.82-34	3.13-34	5.35-34	9.14-34	1.54-33
18	0.00+00	8.13-37	1.55-36	3.92-36	9.39-36	2.05-35	4.12-35	7.81-35	1.42-34	2.50-34	4.31-34	7.25-34	1.15-33	1.31-33
17	0.00+00	9.78-37	1.91-36	4.96-36	1.22-35	2.71-35	5.58-35	1.08-34	2.01-34	3.61-34	6.26-34	1.01-33	1.12-33	-3.75-33
16	0.00+00	1.19-36	2.38-36	6.36-36	1.60-35	3.67-35	7.78-35	1.56-34	2.99-34	5.53-34	9.61-34	1.29-33	-2.34-33	-9.87-32
15	0.00+00	1.47-36	3.02-36	8.31-36	2.16-35	5.12-35	1.13-34	2.36-34	4.75-34	9.13-34	1.52-33	-3.20-34	-7.74-32	
14	0.00+00	1.85-36	3.91-36	1.11-35	3.01-35	7.45-35	1.73-34	3.83-34	8.24-34	1.65-33	1.61-33	-5.31-32		
13	0.00+00	2.38-36	5.19-36	1.54-35	4.36-35	1.14-34	2.84-34	6.88-34	1.62-33	3.03-33	-2.96-32			
12	0.00+00	3.13-36	7.12-36	2.22-35	6.70-35	1.90-34	5.22-34	1.43-33	3.77-33	-9.36-33				
11	0.00+00	4.25-36	1.02-35	3.39-35	1.11-34	3.53-34	1.13-33	3.81-33	5.88-33					
10	0.00+00	5.99-36	1.53-35	5.61-35	2.08-34	7.87-34	3.29-33	1.51-32						
9	0.00+00	8.87-36	2.48-35	1.04-34	4.70-34	2.42-33	1.80-32							
8	0.00+00	1.41-35	4.50-35	2.34-34	1.50-33	1.59-32								
7	0.00+00	2.46-35	9.73-35	7.43-34	1.08-32									
6	0.00+00	5.03-35	2.95-34	5.54-33										
5	0.00+00	1.38-34	2.05-33											
4	0.00+00	7.71-34												
3	0.00+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-7.27-36	5.03-36	2.59-35	5.83-35	1.06-34	1.72-34	2.62-34	3.81-34	5.31-34	7.17-34	9.40-34	1.20-33	1.48-33	1.78-33
45	4.07-35	8.16-35	1.45-34	2.40-34	3.77-34	5.71-34	8.41-34	1.21-33	1.71-33	2.37-33	3.26-33	4.42-33	5.93-33	7.91-33
40	1.18-34	2.08-34	3.48-34	5.59-34	8.72-34	1.33-33	1.99-33	2.95-33	4.31-33	6.28-33	9.10-33	1.32-32	1.92-32	2.80-32
35	2.59-34	4.45-34	7.39-34	1.20-33	1.92-33	3.03-33	4.75-33	7.45-33	1.17-32	1.86-32	2.99-32	4.92-32	8.37-32	1.49-31
30	5.14-34	8.95-34	1.54-33	2.62-33	4.47-33	7.69-33	1.35-32	2.42-32	4.55-32	9.13-32	2.03-31	5.34-31	1.93-30	1.52-29
29	5.87-34	1.03-33	1.79-33	3.10-33	5.41-33	9.60-33	1.75-32	3.31-32	6.71-32	1.50-31	3.97-31	1.44-30	1.13-29	
28	6.69-34	1.18-33	2.09-33	3.70-33	6.65-33	1.22-32	2.34-32	4.78-32	1.08-31	2.86-31	1.04-30	8.17-30		
27	7.63-34	1.37-33	2.46-33	4.47-33	8.33-33	1.61-32	3.31-32	7.49-32	1.99-31	7.24-31	5.67-30			
26	8.76-34	1.59-33	2.93-33	5.51-33	1.08-32	2.22-32	5.05-32	1.35-31	4.87-31	3.79-30				
25	1.01-33	1.88-33	3.56-33	6.98-33	1.45-32	3.30-32	8.77-32	3.16-31	2.43-30					
24	1.18-33	2.24-33	4.40-33	9.13-33	2.07-32	5.48-32	1.95-31	1.47-30						
23	1.40-33	2.72-33	5.60-33	1.25-32	3.26-32	1.13-31	8.22-31							
22	1.68-33	3.37-33	7.35-33	1.84-32	6.02-32	4.05-31								
21	2.04-33	4.20-33	9.69-33	2.79-32	1.47-31									
20	2.43-33	4.78-33	9.43-33	-1.58-33										
19	2.31-33	1.26-34	-7.81-32											
18	-3.48-33	-1.09-31												
17	-1.12-31													

HE + TE = 7.50+03 NE = 1.00+06 CASE B NC = 70

TOTAL RC = 1.946-12 4-3 RC = 4.524-13 4-3 EM = 1.917-24 2S RC = 5.140-13 2P RC = 1.432-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.79-03	1.47-03	6.32-04	3.28-04	1.91-04	1.21-04	8.17-05	5.77-05	4.22-05	3.18-05	2.45-05	1.93-05	1.55-05	1.26-05
45	5.71-03	1.75-03	7.56-04	3.92-04	2.29-04	1.45-04	9.80-05	6.91-05	5.06-05	3.81-05	2.95-05	2.32-05	1.86-05	1.52-05
40	6.87-03	2.12-03	9.14-04	4.75-04	2.78-04	1.77-04	1.19-04	8.43-05	6.17-05	4.66-05	3.60-05	2.84-05	2.28-05	1.86-05
35	8.71-03	2.70-03	1.17-03	6.11-04	3.59-04	2.29-04	1.55-04	1.10-04	8.08-05	6.11-05	4.73-05	3.74-05	3.01-05	2.46-05
30	1.16-02	3.64-03	1.60-03	8.48-04	5.04-04	3.25-04	2.22-04	1.58-04	1.17-04	8.91-05	6.94-05	5.51-05	4.45-05	3.65-05
29	1.23-02	3.88-03	1.72-03	9.12-04	5.45-04	3.52-04	2.41-04	1.72-04	1.28-04	9.74-05	7.60-05	6.04-05	4.89-05	4.01-05
28	1.30-02	4.13-03	1.84-03	9.84-04	5.90-04	3.83-04	2.63-04	1.89-04	1.40-04	1.07-04	8.37-05	6.67-05	5.40-05	4.44-05
27	1.37-02	4.40-03	1.98-03	1.06-03	6.41-04	4.18-04	2.88-04	2.08-04	1.55-04	1.18-04	9.28-05	7.41-05	6.01-05	4.94-05
26	1.45-02	4.69-03	2.12-03	1.15-03	6.99-04	4.58-04	3.18-04	2.30-04	1.72-04	1.32-04	1.04-04	8.29-05	6.74-05	5.55-05
25	1.52-02	5.00-03	2.29-03	1.25-03	7.67-04	5.06-04	3.52-04	2.56-04	1.92-04	1.48-04	1.17-04	9.34-05	7.61-05	6.27-05
24	1.60-02	5.33-03	2.47-03	1.37-03	8.45-04	5.62-04	3.94-04	2.87-04	2.17-04	1.67-04	1.32-04	1.06-04	8.66-05	7.16-05
23	1.67-02	5.69-03	2.68-03	1.50-03	9.38-04	6.28-04	4.43-04	3.25-04	2.46-04	1.91-04	1.51-04	1.22-04	9.95-05	8.23-05
22	1.75-02	6.08-03	2.92-03	1.66-03	1.05-03	7.09-04	5.04-04	3.72-04	2.82-04	2.20-04	1.75-04	1.41-04	1.15-04	9.54-05
21	1.84-02	6.54-03	3.21-03	1.86-03	1.18-03	8.07-04	5.77-04	4.28-04	3.27-04	2.55-04	2.03-04	1.64-04	1.35-04	1.11-04
20	1.95-02	7.09-03	3.56-03	2.09-03	1.35-03	9.28-04	6.69-04	4.99-04	3.82-04	2.99-04	2.39-04	1.93-04	1.58-04	1.31-04
19	2.08-02	7.76-03	3.98-03	2.38-03	1.55-03	1.08-03	7.82-04	5.87-04	4.51-04	3.54-04	2.83-04	2.29-04	1.88-04	1.55-04
18	2.26-02	8.59-03	4.50-03	2.73-03	1.81-03	1.27-03	9.26-04	6.97-04	5.38-04	4.23-04	3.38-04	2.74-04	2.23-04	1.83-04
17	2.50-02	9.67-03	5.17-03	3.19-03	2.13-03	1.51-03	1.11-03	8.38-04	6.48-04	5.11-04	4.08-04	3.29-04	2.66-04	2.14-04
16	2.83-02	1.11-02	6.03-03	3.77-03	2.55-03	1.82-03	1.34-03	1.02-03	7.90-04	6.22-04	4.96-04	3.97-04	3.16-04	2.38-04
15	3.28-02	1.30-02	7.16-03	4.54-03	3.10-03	2.22-03	1.65-03	1.25-03	9.73-04	7.65-04	6.06-04	4.76-04	3.56-04	
14	3.88-02	1.55-02	8.67-03	5.55-03	3.83-03	2.76-03	2.06-03	1.57-03	1.22-03	9.50-04	7.38-04	5.45-04		
13	4.72-02	1.90-02	1.07-02	6.94-03	4.82-03	3.50-03	2.61-03	1.99-03	1.54-03	1.18-03	8.62-04			
12	5.87-02	2.39-02	1.36-02	8.89-03	6.21-03	4.53-03	3.39-03	2.58-03	1.96-03	1.41-03				
11	7.52-02	3.08-02	1.78-02	1.17-02	8.23-03	6.02-03	4.50-03	3.38-03	2.41-03					
10	9.91-02	4.10-02	2.39-02	1.59-02	1.13-02	8.26-03	6.11-03	4.32-03						
9	1.35-01	5.67-02	3.35-02	2.25-02	1.61-02	1.17-02	8.22-03							
8	1.93-01	8.22-02	4.94-02	3.37-02	2.41-02	1.68-02								
7	2.93-01	1.27-01	7.82-02	5.41-02	3.74-02									
6	4.79-01	2.14-01	1.36-01	9.33-02										
5	8.83-01	4.15-01	2.71-01											
4	1.98+00	1.00+00												
3	6.52+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.04-05	8.70-06	7.34-06	6.24-06	5.36-06	4.63-06	4.03-06	3.53-06	3.11-06	2.75-06	2.44-06	2.18-06	1.96-06	1.76-06
45	1.25-05	1.05-05	8.83-06	7.51-06	6.45-06	5.57-06	4.85-06	4.25-06	3.74-06	3.31-06	2.94-06	2.63-06	2.35-06	2.12-06
40	1.54-05	1.28-05	1.08-05	9.22-06	7.92-06	6.85-06	5.96-06	5.22-06	4.59-06	4.07-06	3.63-06	3.23-06	2.89-06	2.60-06
35	2.03-05	1.70-05	1.44-05	1.22-05	1.05-05	9.09-06	7.92-06	6.93-06	6.10-06	5.40-06	4.80-06	4.27-06	3.82-06	3.42-06
30	3.02-05	2.54-05	2.15-05	1.83-05	1.58-05	1.37-05	1.19-05	1.04-05	9.15-06	8.06-06	7.11-06	6.25-06	5.42-06	4.45-06
29	3.33-05	2.79-05	2.37-05	2.02-05	1.74-05	1.51-05	1.31-05	1.15-05	1.01-05	8.84-06	7.75-06	6.70-06	5.48-06	
28	3.69-05	3.10-05	2.63-05	2.24-05	1.93-05	1.67-05	1.46-05	1.27-05	1.11-05	9.70-06	8.36-06	6.81-06		
27	4.11-05	3.46-05	2.93-05	2.51-05	2.16-05	1.87-05	1.62-05	1.41-05	1.23-05	1.05-05	8.56-06			
26	4.62-05	3.89-05	3.30-05	2.82-05	2.43-05	2.10-05	1.82-05	1.57-05	1.35-05	1.09-05				
25	5.23-05	4.41-05	3.74-05	3.20-05	2.75-05	2.37-05	2.04-05	1.74-05	1.40-05					
24	5.97-05	5.03-05	4.27-05	3.65-05	3.13-05	2.68-05	2.27-05	1.82-05						
23	6.87-05	5.79-05	4.91-05	4.18-05	3.56-05	3.00-05	2.39-05							
22	7.97-05	6.71-05	5.67-05	4.79-05	4.01-05	3.18-05								
21	9.29-05	7.80-05	6.55-05	5.44-05	4.28-05									
20	1.09-04	9.07-05	7.48-05	5.85-05										
19	1.28-04	1.04-04	8.10-05											
18	1.48-04	1.14-04												
17	1.63-04													

HE + TE = 7.50+03 NE = 1.00+06 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-4.47-38	-2.83-37	-8.92-37	-2.18-36	-4.55-36	-8.56-36	-1.49-35	-2.45-35	-3.86-35	-5.86-35	-8.67-35	-1.26-34	-1.80-34
45	0.00+00	-4.32-38	-3.11-37	-9.84-37	-2.39-36	-4.94-36	-9.17-36	-1.58-35	-2.55-35	-3.96-35	-5.93-35	-8.66-35	-1.24-34	-1.77-34
40	0.00+00	-3.48-38	-3.29-37	-1.05-36	-2.52-36	-5.11-36	-9.25-36	-1.54-35	-2.41-35	-3.59-35	-5.16-35	-7.21-35	-9.89-35	-1.35-34
35	0.00+00	-1.87-38	-3.52-37	-1.15-36	-2.71-36	-5.34-36	-9.26-36	-1.46-35	-2.12-35	-2.86-35	-3.59-35	-4.15-35	-4.36-35	-3.96-35
30	0.00+00	1.92-38	-3.61-37	-1.24-36	-2.91-36	-5.53-36	-9.04-36	-1.28-35	-1.55-35	-1.43-35	-4.26-36	2.27-35	7.95-35	1.86-34
29	0.00+00	3.34-38	-3.51-37	-1.23-36	-2.89-36	-5.46-36	-8.74-36	-1.20-35	-1.32-35	-9.03-36	7.04-36	4.57-35	1.24-34	2.71-34
28	0.00+00	5.15-38	-3.32-37	-1.21-36	-2.83-36	-5.29-36	-8.27-36	-1.07-35	-1.03-35	-2.35-36	2.12-35	7.45-35	1.81-34	3.79-34
27	0.00+00	7.46-38	-3.03-37	-1.15-36	-2.72-36	-5.01-36	-7.56-36	-9.02-36	-6.39-36	6.12-36	3.90-35	1.11-34	2.53-34	5.20-34
26	0.00+00	1.04-37	-2.59-37	-1.07-36	-2.52-36	-4.57-36	-6.56-36	-6.75-36	-1.41-36	1.68-35	6.14-35	1.57-34	3.46-34	7.05-34
25	0.00+00	1.41-37	-1.97-37	-9.34-37	-2.23-36	-3.93-36	-5.18-36	-3.79-36	4.93-36	3.02-35	8.94-35	2.15-34	4.65-34	9.50-34
24	0.00+00	1.87-37	-1.13-37	-7.46-37	-1.82-36	-3.06-36	-3.35-36	2.05-38	1.29-35	4.69-35	1.24-34	2.88-34	6.20-34	1.28-33
23	0.00+00	2.45-37	-6.84-40	-4.90-37	-1.26-36	-1.89-36	-9.72-37	4.85-36	2.28-35	6.75-35	1.68-34	3.82-34	8.24-34	1.73-33
22	0.00+00	3.16-37	1.44-37	-1.52-37	-5.20-37	-3.61-37	2.08-36	1.09-35	3.51-35	9.31-35	2.23-34	5.02-34	1.10-33	2.37-33
21	0.00+00	4.02-37	3.26-37	2.81-37	4.37-37	1.61-36	5.98-36	1.86-35	5.05-35	1.25-34	2.93-34	6.61-34	1.48-33	3.32-33
20	0.00+00	5.07-37	5.50-37	8.27-37	1.66-36	4.14-36	1.10-35	2.84-35	7.02-35	1.66-34	3.85-34	8.80-34	2.03-33	4.85-33
19	0.00+00	6.33-37	8.25-37	1.51-36	3.23-36	7.42-36	1.75-35	4.12-35	9.58-35	2.21-34	5.09-34	1.19-33	2.88-33	7.51-33
18	0.00+00	7.85-37	1.16-36	2.38-36	5.26-36	1.17-35	2.62-35	5.84-35	1.31-34	2.96-34	6.88-34	1.66-33	4.33-33	1.29-32
17	0.00+00	9.71-37	1.58-36	3.48-36	7.92-36	1.76-35	3.83-35	8.30-35	1.82-34	4.09-34	9.65-34	2.46-33	7.15-33	2.69-32
16	0.00+00	1.20-36	2.09-36	4.91-36	1.15-35	2.59-35	5.61-35	1.20-34	2.61-34	5.89-34	1.43-33	3.92-33	1.35-32	8.27-32
15	0.00+00	1.50-36	2.76-36	6.84-36	1.66-35	3.81-35	8.36-35	1.81-34	3.95-34	9.07-34	2.28-33	6.70-33	2.46-32	
14	0.00+00	1.89-36	3.66-36	9.53-36	2.41-35	5.72-35	1.30-34	2.88-34	6.50-34	1.53-33	3.74-33	2.58-35		
13	0.00+00	2.42-36	4.92-36	1.35-35	3.60-35	8.96-35	2.14-34	5.04-34	1.20-33	2.77-33	-5.90-33			
12	0.00+00	3.19-36	6.78-36	1.97-35	5.60-35	1.50-34	3.89-34	1.01-33	2.60-33	-2.91-33				
11	0.00+00	4.31-36	9.70-36	3.03-35	9.36-35	2.78-34	8.28-34	2.55-33	3.11-33					
10	0.00+00	6.07-36	1.46-35	5.02-35	1.75-34	6.11-34	2.31-33	8.58-33						
9	0.00+00	8.98-36	2.37-35	9.28-35	3.90-34	1.83-33	1.15-32							
8	0.00+00	1.42-35	4.27-35	2.07-34	1.21-33	1.12-32								
7	0.00+00	2.48-35	9.20-35	6.47-34	8.37-33									
6	0.00+00	5.07-35	2.75-34	4.66-33										
5	0.00+00	1.38-34	1.87-33											
4	0.00+00	7.65-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-2.54-34	-3.57-34	-4.98-34	-6.94-34	-9.64-34	-1.34-33	-1.85-33	-2.55-33	-3.50-33	-4.79-33	-6.55-33	-8.93-33	-1.21-32	-1.65-32
45	-2.49-34	-3.51-34	-4.95-34	-7.00-34	-9.93-34	-1.41-33	-2.01-33	-2.87-33	-4.10-33	-5.84-33	-8.33-33	-1.19-32	-1.70-32	-2.43-32
40	-1.84-34	-2.54-34	-3.58-34	-5.14-34	-7.56-34	-1.13-33	-1.71-33	-2.62-33	-4.04-33	-6.23-33	-9.66-33	-1.50-32	-2.36-32	-3.74-32
35	-2.74-35	-5.49-36	2.50-35	5.65-35	7.14-35	3.26-35	-1.36-34	-5.78-34	-1.55-33	-3.57-33	-7.63-33	-1.58-32	-3.27-32	-6.95-32
30	3.73-34	6.86-34	1.20-33	2.02-33	3.32-33	5.39-33	8.74-33	1.43-32	2.38-32	4.15-32	7.80-32	1.67-31	4.59-31	2.41-30
29	5.29-34	9.70-34	1.71-33	2.94-33	4.98-33	8.45-33	1.45-32	2.55-32	4.71-32	9.51-32	2.24-31	7.10-31	4.77-30	
28	7.34-34	1.35-33	2.42-33	4.27-33	7.52-33	1.34-32	2.45-32	4.73-32	9.97-32	2.46-31	8.29-31	6.02-30		
27	1.01-33	1.88-33	3.44-33	6.27-33	1.15-32	2.19-32	4.36-32	9.52-32	2.44-31	8.50-31	6.43-30			
26	1.37-33	2.61-33	4.93-33	9.38-33	1.83-32	3.76-32	8.46-32	2.23-31	7.99-31	6.21-30				
25	1.88-33	3.67-33	7.21-33	1.45-32	3.06-32	7.07-32	1.91-31	7.02-31	5.57-30					
24	2.59-33	5.25-33	1.09-32	2.36-32	5.57-32	1.54-31	5.78-31	4.66-30						
23	3.62-33	7.71-33	1.72-32	4.16-32	1.17-31	4.48-31	3.67-30							
22	5.20-33	1.19-32	2.94-32	8.43-32	3.27-31	2.70-30								
21	7.77-33	1.96-32	5.74-32	2.25-31	1.86-30									
20	1.25-32	3.69-32	1.46-31	1.20-30										
19	2.24-32	8.85-32	7.23-31											
18	5.03-32	3.97-31												
17	1.97-31													

HE + TE = 7.50+03 NE = 1.00+07 CASE B NC = 55

TOTAL RC = 1.999-12 4-3 RC = 4.393-13 4-3 EM = 1.862-24 2S RC = 5.390-13 2P RC = 1.460-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.27-03	1.92-03	8.27-04	4.28-04	2.50-04	1.58-04	1.07-04	7.51-05	5.49-05	4.13-05	3.19-05	2.51-05	2.01-05	1.64-05
45	8.18-03	2.51-03	1.08-03	5.59-04	3.26-04	2.07-04	1.39-04	9.80-05	7.17-05	5.40-05	4.16-05	3.28-05	2.63-05	2.14-05
40	1.06-02	3.26-03	1.40-03	7.26-04	4.24-04	2.68-04	1.81-04	1.27-04	9.31-05	7.01-05	5.41-05	4.26-05	3.42-05	2.78-05
35	1.35-02	4.13-03	1.78-03	9.22-04	5.38-04	3.41-04	2.30-04	1.62-04	1.19-04	8.93-05	6.89-05	5.43-05	4.35-05	3.54-05
30	1.69-02	5.19-03	2.24-03	1.16-03	6.80-04	4.32-04	2.91-04	2.05-04	1.50-04	1.13-04	8.76-05	6.91-05	5.54-05	4.51-05
29	1.78-02	5.47-03	2.36-03	1.23-03	7.18-04	4.56-04	3.08-04	2.17-04	1.59-04	1.20-04	9.27-05	7.31-05	5.86-05	4.78-05
28	1.88-02	5.79-03	2.50-03	1.30-03	7.62-04	4.84-04	3.27-04	2.31-04	1.69-04	1.28-04	9.87-05	7.78-05	6.25-05	5.09-05
27	1.99-02	6.16-03	2.66-03	1.39-03	8.13-04	5.17-04	3.49-04	2.47-04	1.81-04	1.37-04	1.06-04	8.34-05	6.70-05	5.46-05
26	2.13-02	6.59-03	2.85-03	1.49-03	8.74-04	5.57-04	3.76-04	2.66-04	1.95-04	1.48-04	1.14-04	9.02-05	7.24-05	5.90-05
25	2.29-02	7.09-03	3.08-03	1.61-03	9.45-04	6.03-04	4.08-04	2.89-04	2.12-04	1.61-04	1.24-04	9.82-05	7.89-05	6.43-05
24	2.46-02	7.66-03	3.33-03	1.75-03	1.03-03	6.58-04	4.46-04	3.17-04	2.33-04	1.76-04	1.37-04	1.08-04	8.68-05	7.08-05
23	2.66-02	8.31-03	3.63-03	1.91-03	1.13-03	7.23-04	4.91-04	3.49-04	2.57-04	1.95-04	1.51-04	1.20-04	9.63-05	7.86-05
22	2.88-02	9.04-03	3.97-03	2.10-03	1.24-03	8.00-04	5.45-04	3.89-04	2.87-04	2.18-04	1.69-04	1.34-04	1.08-04	8.81-05
21	3.12-02	9.86-03	4.36-03	2.32-03	1.38-03	8.92-04	6.10-04	4.36-04	3.23-04	2.46-04	1.91-04	1.52-04	1.22-04	9.99-05
20	3.38-02	1.08-02	4.81-03	2.57-03	1.54-03	1.00-03	6.89-04	4.95-04	3.68-04	2.80-04	2.19-04	1.74-04	1.40-04	1.15-04
19	3.66-02	1.18-02	5.32-03	2.88-03	1.74-03	1.14-03	7.88-04	5.68-04	4.24-04	3.24-04	2.54-04	2.02-04	1.63-04	1.33-04
18	3.95-02	1.29-02	5.93-03	3.25-03	1.99-03	1.31-03	9.12-04	6.61-04	4.95-04	3.81-04	2.99-04	2.38-04	1.92-04	1.56-04
17	4.26-02	1.43-02	6.66-03	3.70-03	2.29-03	1.53-03	1.07-03	7.82-04	5.89-04	4.54-04	3.57-04	2.84-04	2.28-04	1.83-04
16	4.59-02	1.58-02	7.55-03	4.28-03	2.69-03	1.81-03	1.28-03	9.42-04	7.12-04	5.51-04	4.33-04	3.44-04	2.72-04	2.05-04
15	4.98-02	1.77-02	8.69-03	5.03-03	3.21-03	2.19-03	1.56-03	1.15-03	8.77-04	6.78-04	5.31-04	4.16-04	3.10-04	
14	5.48-02	2.01-02	1.02-02	6.03-03	3.91-03	2.70-03	1.94-03	1.44-03	1.10-03	8.46-04	6.53-04	4.82-04		
13	6.19-02	2.34-02	1.22-02	7.40-03	4.88-03	3.40-03	2.47-03	1.84-03	1.39-03	1.06-03	7.70-04			
12	7.23-02	2.80-02	1.51-02	9.32-03	6.24-03	4.39-03	3.20-03	2.38-03	1.78-03	1.27-03				
11	8.81-02	3.48-02	1.92-02	1.21-02	8.21-03	5.82-03	4.24-03	3.11-03	2.19-03					
10	1.12-01	4.52-02	2.54-02	1.63-02	1.12-02	7.93-03	5.72-03	3.96-03						
9	1.50-01	6.13-02	3.52-02	2.29-02	1.58-02	1.11-02	7.59-03							
8	2.11-01	8.79-02	5.13-02	3.38-02	2.33-02	1.56-02								
7	3.17-01	1.35-01	8.02-02	5.33-02	3.52-02									
6	5.17-01	2.25-01	1.38-01	8.91-02										
5	9.49-01	4.30-01	2.64-01											
4	2.12+00	1.00+00												
3	6.76+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.35-05	1.13-05	9.51-06	8.09-06	6.94-06	6.00-06	5.22-06	4.57-06	4.02-06	3.56-06	3.16-06	2.82-06	2.53-06	2.28-06
45	1.77-05	1.47-05	1.24-05	1.06-05	9.06-06	7.82-06	6.81-06	5.96-06	5.24-06	4.63-06	4.12-06	3.68-06	3.29-06	2.96-06
40	2.29-05	1.91-05	1.61-05	1.37-05	1.18-05	1.02-05	8.84-06	7.73-06	6.80-06	6.01-06	5.34-06	4.76-06	4.26-06	3.83-06
35	2.92-05	2.44-05	2.05-05	1.75-05	1.50-05	1.29-05	1.12-05	9.83-06	8.64-06	7.62-06	6.76-06	6.02-06	5.37-06	4.81-06
30	3.72-05	3.10-05	2.61-05	2.22-05	1.90-05	1.64-05	1.42-05	1.24-05	1.09-05	9.56-06	8.40-06	7.37-06	6.38-06	5.22-06
29	3.94-05	3.29-05	2.77-05	2.35-05	2.01-05	1.74-05	1.51-05	1.31-05	1.15-05	1.00-05	8.76-06	7.55-06	6.16-06	
28	4.20-05	3.50-05	2.95-05	2.51-05	2.14-05	1.85-05	1.60-05	1.39-05	1.21-05	1.05-05	9.04-06	7.34-06		
27	4.50-05	3.76-05	3.16-05	2.69-05	2.30-05	1.98-05	1.71-05	1.48-05	1.28-05	1.10-05	8.86-06			
26	4.87-05	4.06-05	3.42-05	2.90-05	2.48-05	2.13-05	1.84-05	1.58-05	1.34-05	1.08-05				
25	5.31-05	4.43-05	3.73-05	3.16-05	2.70-05	2.31-05	1.98-05	1.67-05	1.34-05					
24	5.84-05	4.87-05	4.10-05	3.47-05	2.95-05	2.51-05	2.12-05	1.69-05						
23	6.49-05	5.41-05	4.54-05	3.84-05	3.24-05	2.72-05	2.16-05							
22	7.28-05	6.06-05	5.08-05	4.26-05	3.55-05	2.80-05								
21	8.24-05	6.85-05	5.71-05	4.72-05	3.71-05									
20	9.44-05	7.80-05	6.41-05	5.00-05										
19	1.09-04	8.88-05	6.88-05											
18	1.26-04	9.68-05												
17	1.39-04													

HE + TE = 7.50+03 NE = 1.00+07 CASE B NC = 55

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-7.05-38	-4.02-37	-1.27-36	-3.17-36	-6.78-36	-1.31-35	-2.35-35	-3.99-35	-6.49-35	-1.02-34	-1.56-34	-2.35-34	-3.46-34
45	0.00+00	-8.84-38	-5.17-37	-1.64-36	-4.10-36	-8.80-36	-1.71-35	-3.07-35	-5.24-35	-8.56-35	-1.36-34	-2.10-34	-3.18-34	-4.75-34
40	0.00+00	-1.05-37	-6.49-37	-2.07-36	-5.18-36	-1.11-35	-2.16-35	-3.91-35	-6.69-35	-1.10-34	-1.76-34	-2.76-34	-4.25-34	-6.46-34
35	0.00+00	-1.08-37	-7.60-37	-2.46-36	-6.13-36	-1.31-35	-2.55-35	-4.59-35	-7.88-35	-1.30-34	-2.10-34	-3.34-34	-5.26-34	-8.21-34
30	0.00+00	-7.71-38	-8.07-37	-2.66-36	-6.60-36	-1.39-35	-2.65-35	-4.71-35	-7.95-35	-1.30-34	-2.10-34	-3.38-34	-5.46-34	-8.88-34
29	0.00+00	-6.61-38	-8.11-37	-2.70-36	-6.67-36	-1.40-35	-2.65-35	-4.66-35	-7.81-35	-1.27-34	-2.04-34	-3.29-34	-5.34-34	-8.77-34
28	0.00+00	-5.34-38	-8.17-37	-2.73-36	-6.74-36	-1.41-35	-2.64-35	-4.61-35	-7.64-35	-1.23-34	-1.97-34	-3.16-34	-5.14-34	-8.56-34
27	0.00+00	-3.86-38	-8.23-37	-2.78-36	-6.84-36	-1.42-35	-2.64-35	-4.55-35	-7.45-35	-1.18-34	-1.87-34	-2.98-34	-4.87-34	-8.20-34
26	0.00+00	-2.12-38	-8.30-37	-2.83-36	-6.96-36	-1.43-35	-2.64-35	-4.48-35	-7.21-35	-1.12-34	-1.74-34	-2.74-34	-4.47-34	-7.64-34
25	0.00+00	-2.18-40	-8.36-37	-2.89-36	-7.09-36	-1.45-35	-2.64-35	-4.40-35	-6.91-35	-1.05-34	-1.57-34	-2.41-34	-3.88-34	-6.71-34
24	0.00+00	2.59-38	-8.39-37	-2.95-36	-7.22-36	-1.46-35	-2.62-35	-4.28-35	-6.49-35	-9.39-35	-1.33-34	-1.91-34	-2.96-34	-5.13-34
23	0.00+00	5.94-38	-8.32-37	-2.99-36	-7.32-36	-1.47-35	-2.59-35	-4.09-35	-5.89-35	-7.82-35	-9.68-35	-1.16-34	-1.47-34	-2.35-34
22	0.00+00	1.03-37	-8.09-37	-3.00-36	-7.34-36	-1.46-35	-2.50-35	-3.77-35	-4.97-35	-5.48-35	-4.20-35	4.16-36	1.05-34	2.74-34
21	0.00+00	1.62-37	-7.60-37	-2.95-36	-7.24-36	-1.42-35	-2.34-35	-3.27-35	-3.57-35	-1.90-35	4.37-35	2.00-34	5.48-34	1.25-33
20	0.00+00	2.40-37	-6.69-37	-2.80-36	-6.91-36	-1.32-35	-2.06-35	-2.47-35	-1.40-35	3.65-35	1.81-34	5.32-34	1.35-33	3.24-33
19	0.00+00	3.47-37	-5.17-37	-2.51-36	-6.23-36	-1.15-35	-1.60-35	-1.22-35	1.92-35	1.23-34	4.05-34	1.11-33	2.91-33	7.75-33
18	0.00+00	4.92-37	-2.78-37	-2.00-36	-5.05-36	-8.65-36	-8.74-36	6.95-36	7.05-35	2.62-34	7.86-34	2.20-33	6.27-33	1.98-32
17	0.00+00	6.87-37	8.10-38	-1.18-36	-3.15-36	-4.12-36	2.49-36	3.62-35	1.50-34	4.90-34	1.47-33	4.44-33	1.48-32	6.41-32
16	0.00+00	9.51-37	6.03-37	6.38-38	-2.16-37	2.80-36	1.95-35	8.10-35	2.78-34	8.82-34	2.81-33	9.81-33	4.42-32	4.07-31
15	0.00+00	1.30-36	1.34-36	1.89-36	4.19-36	1.33-35	4.56-35	1.52-34	4.92-34	1.62-33	5.87-33	2.71-32	2.53-31	
14	0.00+00	1.77-36	2.36-36	4.53-36	1.08-35	2.95-35	8.72-35	2.70-34	8.87-34	3.24-33	1.52-32	1.39-31		
13	0.00+00	2.39-36	3.76-36	8.39-36	2.10-35	5.60-35	1.59-34	4.93-34	1.74-33	7.89-33	6.82-32			
12	0.00+00	3.24-36	5.76-36	1.43-35	3.78-35	1.03-34	2.99-34	9.81-34	4.09-33	3.02-32				
11	0.00+00	4.44-36	8.73-36	2.39-35	6.83-35	1.99-34	6.29-34	2.40-33	1.39-32					
10	0.00+00	6.27-36	1.35-35	4.13-35	1.32-34	4.41-34	1.68-33	8.63-33						
9	0.00+00	9.24-36	2.21-35	7.77-35	2.97-34	1.29-33	7.72-33							
8	0.00+00	1.46-35	3.98-35	1.73-34	9.09-34	7.36-33								
7	0.00+00	2.54-35	8.51-35	5.31-34	5.96-33									
6	0.00+00	5.16-35	2.51-34	3.68-33										
5	0.00+00	1.40-34	1.65-33											
4	0.00+00	7.62-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.02-34	-7.19-34	-1.02-33	-1.42-33	-1.96-33	-2.67-33	-3.62-33	-4.87-33	-6.49-33	-8.61-33	-1.13-32	-1.48-32	-1.93-32	-2.49-32
45	-7.00-34	-1.02-33	-1.46-33	-2.08-33	-2.93-33	-4.09-33	-5.68-33	-7.84-33	-1.08-32	-1.47-32	-2.01-32	-2.73-32	-3.70-32	-5.01-32
40	-9.70-34	-1.44-33	-2.13-33	-3.12-33	-4.53-33	-6.56-33	-9.46-33	-1.36-32	-1.96-32	-2.83-32	-4.09-32	-5.93-32	-8.66-32	-1.28-31
35	-1.27-33	-1.97-33	-3.03-33	-4.65-33	-7.14-33	-1.10-32	-1.69-32	-2.62-32	-4.12-32	-6.57-32	-1.07-31	-1.78-31	-3.08-31	-5.60-31
30	-1.46-33	-2.41-33	-4.02-33	-6.77-33	-1.15-32	-2.00-32	-3.56-32	-6.58-32	-1.28-31	-2.67-31	-6.24-31	-1.74-30	-6.70-30	-5.70-29
29	-1.46-33	-2.47-33	-4.23-33	-7.33-33	-1.29-32	-2.34-32	-4.38-32	-8.63-32	-1.83-31	-4.32-31	-1.22-30	-4.78-30	-4.14-29	
28	-1.46-33	-2.52-33	-4.45-33	-8.00-33	-1.47-32	-2.81-32	-5.62-32	-1.21-31	-2.90-31	-8.29-31	-3.30-30	-2.90-29		
27	-1.43-33	-2.55-33	-4.68-33	-8.82-33	-1.72-32	-3.50-32	-7.67-32	-1.87-31	-5.43-31	-2.19-30	-1.95-29			
26	-1.37-33	-2.54-33	-4.91-33	-9.82-33	-2.06-32	-4.62-32	-1.15-31	-3.40-31	-1.40-30	-1.27-29				
25	-1.24-33	-2.45-33	-5.07-33	-1.10-32	-2.57-32	-6.60-32	-2.01-31	-8.44-31	-7.82-30					
24	-1.00-33	-2.16-33	-4.99-33	-1.24-32	-3.36-32	-1.07-31	-4.70-31	-4.49-30						
23	-5.21-34	-1.41-33	-4.12-33	-1.30-32	-4.65-32	-2.21-31	-2.27-30							
22	4.81-34	5.07-34	-6.86-34	-8.67-33	-6.35-32	-8.20-31								
21	2.67-33	5.64-33	1.24-32	2.96-32	6.21-32									
20	7.95-33	2.16-32	7.58-32	5.38-31										
19	2.30-32	8.89-32	7.18-31											
18	8.16-32	6.99-31												
17	5.73-31													

HE + TE = 7.50+03 NE = 1.00+08 CASE B NC = 35

TOTAL RC = 2.098-12 4-3 RC = 4.259-13 4-3 EM = 1.805-24 2S RC = 5.821-13 2P RC = 1.516-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.91-03	2.12-03	9.12-04	4.72-04	2.76-04	1.75-04	1.17-04	8.28-05	6.05-05	4.56-05	3.52-05	2.77-05	2.22-05	1.81-05
45	9.44-03	2.90-03	1.24-03	6.45-04	3.76-04	2.38-04	1.60-04	1.13-04	8.25-05	6.22-05	4.80-05	3.78-05	3.03-05	2.46-05
40	1.32-02	4.06-03	1.75-03	9.04-04	5.27-04	3.34-04	2.25-04	1.58-04	1.16-04	8.71-05	6.72-05	5.29-05	4.24-05	3.45-05
35	1.89-02	5.80-03	2.49-03	1.29-03	7.53-04	4.77-04	3.21-04	2.26-04	1.65-04	1.24-04	9.60-05	7.56-05	6.05-05	4.92-05
30	2.70-02	8.28-03	3.56-03	1.84-03	1.08-03	6.81-04	4.58-04	3.23-04	2.36-04	1.78-04	1.37-04	1.08-04	8.63-05	7.02-05
29	2.88-02	8.85-03	3.80-03	1.97-03	1.15-03	7.28-04	4.90-04	3.45-04	2.52-04	1.90-04	1.46-04	1.15-04	9.23-05	7.50-05
28	3.07-02	9.43-03	4.05-03	2.10-03	1.23-03	7.76-04	5.22-04	3.68-04	2.69-04	2.02-04	1.56-04	1.23-04	9.84-05	7.99-05
27	3.26-02	1.00-02	4.31-03	2.23-03	1.30-03	8.25-04	5.55-04	3.91-04	2.86-04	2.15-04	1.66-04	1.31-04	1.05-04	8.50-05
26	3.46-02	1.06-02	4.56-03	2.37-03	1.38-03	8.75-04	5.88-04	4.15-04	3.03-04	2.28-04	1.76-04	1.38-04	1.11-04	9.00-05
25	3.65-02	1.12-02	4.82-03	2.50-03	1.46-03	9.25-04	6.22-04	4.39-04	3.21-04	2.41-04	1.86-04	1.46-04	1.17-04	9.52-05
24	3.85-02	1.18-02	5.09-03	2.64-03	1.54-03	9.77-04	6.58-04	4.64-04	3.39-04	2.55-04	1.97-04	1.55-04	1.24-04	1.01-04
23	4.07-02	1.25-02	5.38-03	2.79-03	1.63-03	1.03-03	6.96-04	4.91-04	3.59-04	2.70-04	2.08-04	1.64-04	1.31-04	1.06-04
22	4.31-02	1.32-02	5.71-03	2.96-03	1.73-03	1.10-03	7.40-04	5.21-04	3.81-04	2.87-04	2.21-04	1.74-04	1.39-04	1.13-04
21	4.59-02	1.41-02	6.10-03	3.17-03	1.85-03	1.18-03	7.92-04	5.59-04	4.09-04	3.08-04	2.37-04	1.87-04	1.49-04	1.21-04
20	4.94-02	1.52-02	6.58-03	3.42-03	2.00-03	1.27-03	8.58-04	6.06-04	4.43-04	3.34-04	2.57-04	2.02-04	1.62-04	1.31-04
19	5.37-02	1.66-02	7.18-03	3.74-03	2.19-03	1.40-03	9.42-04	6.65-04	4.87-04	3.67-04	2.83-04	2.22-04	1.77-04	1.43-04
18	5.90-02	1.83-02	7.93-03	4.14-03	2.43-03	1.55-03	1.05-03	7.42-04	5.43-04	4.10-04	3.16-04	2.48-04	1.97-04	1.58-04
17	6.53-02	2.03-02	8.85-03	4.64-03	2.74-03	1.75-03	1.18-03	8.40-04	6.16-04	4.65-04	3.58-04	2.81-04	2.22-04	1.75-04
16	7.27-02	2.28-02	9.98-03	5.26-03	3.12-03	2.00-03	1.36-03	9.66-04	7.10-04	5.36-04	4.13-04	3.22-04	2.51-04	1.87-04
15	8.14-02	2.57-02	1.14-02	6.05-03	3.61-03	2.33-03	1.59-03	1.13-03	8.35-04	6.30-04	4.84-04	3.73-04	2.75-04	
14	9.13-02	2.93-02	1.31-02	7.06-03	4.25-03	2.76-03	1.90-03	1.36-03	1.00-03	7.57-04	5.74-04	4.18-04		
13	1.03-01	3.36-02	1.53-02	8.38-03	5.11-03	3.36-03	2.33-03	1.67-03	1.24-03	9.22-04	6.63-04			
12	1.16-01	3.89-02	1.83-02	1.02-02	6.33-03	4.21-03	2.94-03	2.12-03	1.55-03	1.10-03				
11	1.32-01	4.61-02	2.24-02	1.28-02	8.11-03	5.46-03	3.84-03	2.75-03	1.91-03					
10	1.55-01	5.65-02	2.85-02	1.68-02	1.08-02	7.36-03	5.15-03	3.51-03						
9	1.91-01	7.25-02	3.81-02	2.31-02	1.51-02	1.03-02	6.82-03							
8	2.53-01	9.91-02	5.41-02	3.36-02	2.20-02	1.43-02								
7	3.64-01	1.47-01	8.27-02	5.19-02	3.26-02									
6	5.79-01	2.41-01	1.38-01	8.41-02										
5	1.05+00	4.49-01	2.55-01											
4	2.31+00	1.00+00												
3	7.13+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.49-05	1.24-05	1.05-05	8.91-06	7.65-06	6.61-06	5.75-06	5.03-06	4.43-06	3.92-06	3.48-06	3.11-06	2.78-06	2.50-06
45	2.03-05	1.69-05	1.43-05	1.21-05	1.04-05	9.00-06	7.82-06	6.85-06	6.02-06	5.33-06	4.73-06	4.22-06	3.78-06	3.40-06
40	2.84-05	2.37-05	2.00-05	1.70-05	1.46-05	1.26-05	1.09-05	9.56-06	8.41-06	7.43-06	6.60-06	5.88-06	5.27-06	4.73-06
35	4.06-05	3.38-05	2.85-05	2.42-05	2.08-05	1.79-05	1.56-05	1.36-05	1.19-05	1.05-05	9.34-06	8.30-06	7.41-06	6.62-06
30	5.78-05	4.82-05	4.05-05	3.44-05	2.94-05	2.54-05	2.20-05	1.92-05	1.68-05	1.47-05	1.29-05	1.13-05	9.76-06	7.96-06
29	6.18-05	5.15-05	4.33-05	3.67-05	3.14-05	2.70-05	2.34-05	2.04-05	1.78-05	1.55-05	1.35-05	1.17-05	9.48-06	
28	6.58-05	5.48-05	4.61-05	3.91-05	3.34-05	2.87-05	2.49-05	2.16-05	1.88-05	1.63-05	1.39-05	1.13-05		
27	6.99-05	5.82-05	4.89-05	4.15-05	3.54-05	3.04-05	2.62-05	2.27-05	1.96-05	1.67-05	1.35-05			
26	7.41-05	6.17-05	5.18-05	4.39-05	3.74-05	3.21-05	2.76-05	2.37-05	2.01-05	1.61-05				
25	7.83-05	6.51-05	5.47-05	4.62-05	3.93-05	3.36-05	2.87-05	2.42-05	1.93-05					
24	8.27-05	6.87-05	5.76-05	4.86-05	4.12-05	3.49-05	2.93-05	2.33-05						
23	8.74-05	7.25-05	6.07-05	5.10-05	4.30-05	3.58-05	2.83-05							
22	9.27-05	7.68-05	6.40-05	5.35-05	4.43-05	3.48-05								
21	9.90-05	8.18-05	6.77-05	5.56-05	4.34-05									
20	1.07-04	8.76-05	7.14-05	5.53-05										
19	1.16-04	9.37-05	7.20-05											
18	1.26-04	9.62-05												
17	1.32-04													

HE + TE = 7.50+03 NE = 1.00+08 CASE B NC = 35

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-7.61-38	-4.38-37	-1.40-36	-3.51-36	-7.60-36	-1.49-35	-2.70-35	-4.64-35	-7.64-35	-1.21-34	-1.86-34	-2.79-34	-4.07-34
45	0.00+00	-1.04-37	-6.00-37	-1.92-36	-4.85-36	-1.05-35	-2.07-35	-3.79-35	-6.57-35	-1.09-34	-1.75-34	-2.71-34	-4.11-34	-6.07-34
40	0.00+00	-1.45-37	-8.44-37	-2.72-36	-6.89-36	-1.51-35	-2.99-35	-5.54-35	-9.64-35	-1.62-34	-2.63-34	-4.15-34	-6.39-34	-9.64-34
35	0.00+00	-2.00-37	-1.20-36	-3.89-36	-9.94-36	-2.19-35	-4.39-35	-8.21-35	-1.46-34	-2.49-34	-4.13-34	-6.67-34	-1.05-33	-1.64-33
30	0.00+00	-2.58-37	-1.66-36	-5.47-36	-1.41-35	-3.15-35	-6.40-35	-1.22-34	-2.21-34	-3.89-34	-6.65-34	-1.12-33	-1.84-33	-3.01-33
29	0.00+00	-2.65-37	-1.76-36	-5.80-36	-1.50-35	-3.36-35	-6.84-35	-1.31-34	-2.39-34	-4.23-34	-7.30-34	-1.24-33	-2.07-33	-3.43-33
28	0.00+00	-2.69-37	-1.84-36	-6.11-36	-1.58-35	-3.56-35	-7.27-35	-1.40-34	-2.57-34	-4.58-34	-7.99-34	-1.37-33	-2.32-33	-3.91-33
27	0.00+00	-2.67-37	-1.92-36	-6.40-36	-1.66-35	-3.74-35	-7.67-35	-1.48-34	-2.74-34	-4.93-34	-8.70-34	-1.51-33	-2.61-33	-4.47-33
26	0.00+00	-2.59-37	-1.97-36	-6.64-36	-1.73-35	-3.90-35	-8.02-35	-1.56-34	-2.90-34	-5.27-34	-9.42-34	-1.66-33	-2.92-33	-5.12-33
25	0.00+00	-2.43-37	-2.02-36	-6.83-36	-1.78-35	-4.03-35	-8.32-35	-1.62-34	-3.05-34	-5.60-34	-1.01-33	-1.83-33	-3.27-33	-5.89-33
24	0.00+00	-2.18-37	-2.04-36	-6.97-36	-1.82-35	-4.13-35	-8.54-35	-1.67-34	-3.17-34	-5.90-34	-1.09-33	-2.00-33	-3.67-33	-6.82-33
23	0.00+00	-1.84-37	-2.04-36	-7.06-36	-1.85-35	-4.20-35	-8.70-35	-1.71-34	-3.27-34	-6.17-34	-1.16-33	-2.18-33	-4.14-33	-7.99-33
22	0.00+00	-1.40-37	-2.03-36	-7.13-36	-1.87-35	-4.25-35	-8.81-35	-1.74-34	-3.36-34	-6.43-34	-1.23-33	-2.39-33	-4.71-33	-9.55-33
21	0.00+00	-8.49-38	-2.01-36	-7.19-36	-1.90-35	-4.29-35	-8.90-35	-1.76-34	-3.43-34	-6.69-34	-1.32-33	-2.65-33	-5.48-33	-1.18-32
20	0.00+00	-1.87-38	-2.00-36	-7.28-36	-1.92-35	-4.35-35	-9.01-35	-1.79-34	-3.52-34	-6.99-34	-1.42-33	-2.99-33	-6.59-33	-1.55-32
19	0.00+00	6.27-38	-1.98-36	-7.40-36	-1.96-35	-4.43-35	-9.15-35	-1.82-34	-3.61-34	-7.34-34	-1.56-33	-3.48-33	-8.34-33	-2.22-32
18	0.00+00	1.66-37	-1.95-36	-7.55-36	-2.01-35	-4.52-35	-9.29-35	-1.84-34	-3.68-34	-7.70-34	-1.72-33	-4.18-33	-1.14-32	-3.67-32
17	0.00+00	3.04-37	-1.89-36	-7.66-36	-2.06-35	-4.60-35	-9.36-35	-1.84-34	-3.68-34	-7.93-34	-1.90-33	-5.21-33	-1.73-32	-7.93-32
16	0.00+00	4.94-37	-1.76-36	-7.66-36	-2.07-35	-4.60-35	-9.16-35	-1.75-34	-3.42-34	-7.49-34	-1.97-33	-6.59-33	-3.16-32	-3.36-31
15	0.00+00	7.66-37	-1.48-36	-7.34-36	-2.02-35	-4.40-35	-8.29-35	-1.43-34	-2.42-34	-4.70-34	-1.33-33	-6.68-33	-8.33-32	
14	0.00+00	1.17-36	-9.51-37	-6.41-36	-1.80-35	-3.73-35	-5.91-35	-5.70-35	7.02-35	7.10-34	3.97-33	3.41-32		
13	0.00+00	1.76-36	1.63-38	-4.35-36	-1.28-35	-2.12-35	-1.50-36	1.70-34	1.08-33	6.42-33	6.86-32			
12	0.00+00	2.67-36	1.71-36	-2.30-37	-1.58-36	1.46-35	1.37-34	8.21-34	5.20-33	5.98-32				
11	0.00+00	4.05-36	4.61-36	7.55-36	2.15-35	9.58-35	5.05-34	3.20-33	3.82-32					
10	0.00+00	6.18-36	9.52-36	2.24-35	7.14-35	3.02-34	1.76-33	1.99-32						
9	0.00+00	9.56-36	1.82-35	5.30-35	1.98-34	1.01-33	1.01-32							
8	0.00+00	1.54-35	3.54-35	1.30-34	6.44-34	5.85-33								
7	0.00+00	2.67-35	7.70-35	4.09-34	4.10-33									
6	0.00+00	5.39-35	2.23-34	2.72-33										
5	0.00+00	1.44-34	1.40-33											
4	0.00+00	7.69-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.82-34	-8.14-34	-1.12-33	-1.51-33	-2.00-33	-2.60-33	-3.30-33	-4.12-33	-5.04-33	-6.06-33	-7.19-33	-8.43-33	-9.80-33	-1.13-32
45	-8.80-34	-1.25-33	-1.75-33	-2.41-33	-3.25-33	-4.32-33	-5.63-33	-7.22-33	-9.09-33	-1.13-32	-1.39-32	-1.69-32	-2.06-32	-2.49-32
40	-1.43-33	-2.08-33	-2.98-33	-4.21-33	-5.88-33	-8.08-33	-1.09-32	-1.46-32	-1.93-32	-2.53-32	-3.29-32	-4.29-32	-5.62-32	-7.42-32
35	-2.50-33	-3.78-33	-5.66-33	-8.38-33	-1.23-32	-1.79-32	-2.60-32	-3.74-32	-5.38-32	-7.77-32	-1.14-31	-1.70-31	-2.62-31	-4.25-31
30	-4.88-33	-7.87-33	-1.27-32	-2.05-32	-3.33-32	-5.46-32	-9.09-32	-1.55-31	-2.75-31	-5.18-31	-1.08-30	-2.67-30	-9.11-30	-6.85-29
29	-5.65-33	-9.28-33	-1.53-32	-2.54-32	-4.27-32	-7.28-32	-1.27-31	-2.31-31	-4.46-31	-9.50-31	-2.39-30	-8.30-30	-6.32-29	
28	-6.57-33	-1.10-32	-1.87-32	-3.21-32	-5.60-32	-1.00-31	-1.87-31	-3.71-31	-8.08-31	-2.08-30	-7.35-30	-5.69-29		
27	-7.68-33	-1.33-32	-2.32-32	-4.14-32	-7.60-32	-1.45-31	-2.95-31	-6.61-31	-1.74-30	-6.30-30	-4.97-29			
26	-9.03-33	-1.61-32	-2.93-32	-5.51-32	-1.08-31	-2.25-31	-5.17-31	-1.40-30	-5.18-30	-4.19-29				
25	-1.07-32	-1.99-32	-3.81-32	-7.62-32	-1.63-31	-3.84-31	-1.07-30	-4.07-30	-3.38-29					
24	-1.29-32	-2.52-32	-5.14-32	-1.12-31	-2.71-31	-7.74-31	-3.03-30	-2.59-29						
23	-1.59-32	-3.30-32	-7.34-32	-1.81-31	-5.30-31	-2.13-30	-1.87-29							
22	-2.02-32	-4.58-32	-1.15-31	-3.44-31	-1.42-30	-1.28-29								
21	-2.72-32	-6.97-32	-2.12-31	-8.91-31	-8.24-30									
20	-4.03-32	-1.25-31	-5.33-31	-5.03-30										
19	-6.98-32	-3.04-31	-2.92-30											
18	-1.63-31	-1.60-30												
17	-8.00-31													

HE + TE = 7.50+03 NE = 1.00+09 CASE B NC = 22

TOTAL RC = 2.289-12 4-3 RC = 4.183-13 4-3 EM = 1.773-24 2S RC = 6.578-13 2P RC = 1.631-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.13-03	2.19-03	9.40-04	4.87-04	2.84-04	1.80-04	1.21-04	8.54-05	6.24-05	4.70-05	3.63-05	2.86-05	2.29-05	1.86-05
45	9.84-03	3.02-03	1.30-03	6.72-04	3.92-04	2.48-04	1.67-04	1.18-04	8.60-05	6.48-05	5.00-05	3.94-05	3.16-05	2.57-05
40	1.41-02	4.32-03	1.86-03	9.62-04	5.61-04	3.55-04	2.39-04	1.68-04	1.23-04	9.27-05	7.15-05	5.63-05	4.51-05	3.67-05
35	2.11-02	6.47-03	2.78-03	1.44-03	8.40-04	5.32-04	3.58-04	2.52-04	1.84-04	1.39-04	1.07-04	8.42-05	6.74-05	5.49-05
30	3.33-02	1.02-02	4.39-03	2.27-03	1.32-03	8.38-04	5.64-04	3.97-04	2.90-04	2.18-04	1.68-04	1.32-04	1.06-04	8.61-05
29	3.67-02	1.12-02	4.83-03	2.50-03	1.46-03	9.23-04	6.21-04	4.37-04	3.19-04	2.40-04	1.85-04	1.46-04	1.17-04	9.48-05
28	4.05-02	1.24-02	5.33-03	2.76-03	1.61-03	1.02-03	6.85-04	4.82-04	3.52-04	2.65-04	2.04-04	1.61-04	1.29-04	1.04-04
27	4.47-02	1.37-02	5.89-03	3.05-03	1.78-03	1.13-03	7.57-04	5.33-04	3.89-04	2.93-04	2.25-04	1.77-04	1.42-04	1.15-04
26	4.95-02	1.52-02	6.51-03	3.37-03	1.97-03	1.24-03	8.36-04	5.89-04	4.30-04	3.23-04	2.49-04	1.96-04	1.57-04	1.27-04
25	5.47-02	1.68-02	7.20-03	3.73-03	2.17-03	1.37-03	9.24-04	6.50-04	4.75-04	3.57-04	2.75-04	2.16-04	1.73-04	1.40-04
24	6.04-02	1.85-02	7.95-03	4.12-03	2.40-03	1.52-03	1.02-03	7.18-04	5.24-04	3.94-04	3.03-04	2.38-04	1.90-04	1.54-04
23	6.66-02	2.04-02	8.76-03	4.53-03	2.64-03	1.67-03	1.12-03	7.90-04	5.76-04	4.33-04	3.33-04	2.62-04	2.09-04	1.69-04
22	7.24-02	2.22-02	9.54-03	4.94-03	2.88-03	1.82-03	1.22-03	8.61-04	6.28-04	4.72-04	3.63-04	2.85-04	2.28-04	1.85-04
21	7.89-02	2.42-02	1.04-02	5.38-03	3.14-03	1.98-03	1.33-03	9.38-04	6.84-04	5.14-04	3.95-04	3.10-04	2.48-04	2.00-04
20	8.53-02	2.62-02	1.12-02	5.82-03	3.39-03	2.15-03	1.44-03	1.01-03	7.40-04	5.55-04	4.27-04	3.35-04	2.67-04	2.15-04
19	9.15-02	2.81-02	1.21-02	6.24-03	3.64-03	2.30-03	1.55-03	1.09-03	7.93-04	5.95-04	4.57-04	3.58-04	2.85-04	2.29-04
18	9.75-02	2.99-02	1.29-02	6.66-03	3.88-03	2.46-03	1.65-03	1.16-03	8.46-04	6.34-04	4.87-04	3.80-04	3.01-04	2.41-04
17	1.04-01	3.18-02	1.37-02	7.09-03	4.13-03	2.62-03	1.76-03	1.24-03	9.00-04	6.74-04	5.16-04	4.02-04	3.17-04	2.49-04
16	1.11-01	3.41-02	1.47-02	7.60-03	4.44-03	2.81-03	1.89-03	1.33-03	9.65-04	7.22-04	5.51-04	4.26-04	3.30-04	2.44-04
15	1.20-01	3.71-02	1.60-02	8.29-03	4.84-03	3.06-03	2.06-03	1.45-03	1.05-03	7.84-04	5.95-04	4.53-04	3.31-04	
14	1.33-01	4.11-02	1.78-02	9.23-03	5.40-03	3.42-03	2.30-03	1.61-03	1.17-03	8.68-04	6.49-04	4.66-04		
13	1.51-01	4.67-02	2.02-02	1.06-02	6.18-03	3.93-03	2.64-03	1.85-03	1.34-03	9.77-04	6.89-04			
12	1.74-01	5.42-02	2.36-02	1.24-02	7.28-03	4.63-03	3.12-03	2.18-03	1.55-03	1.07-03				
11	2.04-01	6.41-02	2.82-02	1.49-02	8.83-03	5.64-03	3.80-03	2.63-03	1.78-03					
10	2.42-01	7.74-02	3.46-02	1.86-02	1.11-02	7.14-03	4.78-03	3.15-03						
9	2.92-01	9.59-02	4.41-02	2.41-02	1.47-02	9.43-03	6.05-03							
8	3.63-01	1.24-01	5.93-02	3.34-02	2.05-02	1.27-02								
7	4.79-01	1.72-01	8.62-02	4.97-02	2.96-02									
6	7.05-01	2.66-01	1.38-01	7.83-02										
5	1.21+00	4.73-01	2.45-01											
4	2.58+00	1.00+00												
3	7.63+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.54-05	1.28-05	1.08-05	9.20-06	7.89-06	6.81-06	5.93-06	5.19-06	4.57-06	4.04-06	3.59-06	3.20-06	2.87-06	2.58-06
45	2.12-05	1.77-05	1.49-05	1.27-05	1.09-05	9.38-06	8.15-06	7.13-06	6.28-06	5.55-06	4.93-06	4.40-06	3.94-06	3.54-06
40	3.03-05	2.52-05	2.13-05	1.81-05	1.55-05	1.34-05	1.16-05	1.02-05	8.95-06	7.91-06	7.02-06	6.26-06	5.60-06	5.03-06
35	4.52-05	3.77-05	3.17-05	2.70-05	2.31-05	1.99-05	1.73-05	1.51-05	1.33-05	1.17-05	1.04-05	9.24-06	8.24-06	7.37-06
30	7.09-05	5.91-05	4.97-05	4.22-05	3.61-05	3.11-05	2.69-05	2.34-05	2.05-05	1.80-05	1.58-05	1.38-05	1.19-05	9.71-06
29	7.80-05	6.50-05	5.46-05	4.64-05	3.96-05	3.41-05	2.95-05	2.57-05	2.24-05	1.95-05	1.70-05	1.46-05	1.19-05	
28	8.60-05	7.16-05	6.02-05	5.10-05	4.36-05	3.74-05	3.24-05	2.81-05	2.44-05	2.11-05	1.81-05	1.46-05		
27	9.48-05	7.89-05	6.63-05	5.61-05	4.79-05	4.11-05	3.54-05	3.06-05	2.64-05	2.25-05	1.81-05			
26	1.05-04	8.69-05	7.30-05	6.18-05	5.26-05	4.50-05	3.87-05	3.32-05	2.81-05	2.25-05				
25	1.15-04	9.58-05	8.03-05	6.78-05	5.77-05	4.92-05	4.19-05	3.53-05	2.82-05					
24	1.27-04	1.05-04	8.81-05	7.43-05	6.29-05	5.32-05	4.46-05	3.53-05						
23	1.39-04	1.15-04	9.62-05	8.08-05	6.79-05	5.65-05	4.45-05							
22	1.51-04	1.25-04	1.04-04	8.68-05	7.17-05	5.62-05								
21	1.64-04	1.35-04	1.11-04	9.14-05	7.11-05									
20	1.75-04	1.43-04	1.17-04	9.00-05										
19	1.85-04	1.49-04	1.14-04											
18	1.91-04	1.45-04												
17	1.86-04													

HE + TE = 7.50+03 NE = 1.00+09 CASE B NC = 22

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-7.20-38	-4.39-37	-1.42-36	-3.59-36	-7.82-36	-1.53-35	-2.78-35	-4.75-35	-7.72-35	-1.20-34	-1.79-34	-2.57-34	-3.54-34
45	0.00+00	-1.00-37	-6.10-37	-1.98-36	-5.03-36	-1.10-35	-2.17-35	-3.97-35	-6.81-35	-1.12-34	-1.76-34	-2.65-34	-3.85-34	-5.38-34
40	0.00+00	-1.45-37	-8.83-37	-2.88-36	-7.35-36	-1.62-35	-3.22-35	-5.95-35	-1.04-34	-1.72-34	-2.73-34	-4.19-34	-6.20-34	-8.85-34
35	0.00+00	-2.20-37	-1.34-36	-4.40-36	-1.13-35	-2.52-35	-5.08-35	-9.52-35	-1.69-34	-2.85-34	-4.63-34	-7.28-34	-1.11-33	-1.63-33
30	0.00+00	-3.48-37	-2.15-36	-7.14-36	-1.86-35	-4.21-35	-8.64-35	-1.66-34	-3.01-34	-5.25-34	-8.83-34	-1.44-33	-2.30-33	-3.57-33
29	0.00+00	-3.83-37	-2.38-36	-7.91-36	-2.07-35	-4.70-35	-9.71-35	-1.87-34	-3.43-34	-6.02-34	-1.02-33	-1.69-33	-2.73-33	-4.30-33
28	0.00+00	-4.22-37	-2.63-36	-8.79-36	-2.31-35	-5.27-35	-1.09-34	-2.12-34	-3.92-34	-6.95-34	-1.19-33	-2.00-33	-3.27-33	-5.24-33
27	0.00+00	-4.64-37	-2.92-36	-9.78-36	-2.58-35	-5.92-35	-1.24-34	-2.42-34	-4.50-34	-8.06-34	-1.40-33	-2.38-33	-3.97-33	-6.48-33
26	0.00+00	-5.09-37	-3.23-36	-1.09-35	-2.88-35	-6.65-35	-1.40-34	-2.76-34	-5.19-34	-9.41-34	-1.66-33	-2.87-33	-4.88-33	-8.15-33
25	0.00+00	-5.55-37	-3.58-36	-1.21-35	-3.23-35	-7.49-35	-1.59-34	-3.16-34	-6.01-34	-1.11-33	-1.98-33	-3.49-33	-6.07-33	-1.04-32
24	0.00+00	-6.02-37	-3.95-36	-1.34-35	-3.60-35	-8.42-35	-1.80-34	-3.63-34	-6.99-34	-1.31-33	-2.39-33	-4.30-33	-7.69-33	-1.36-32
23	0.00+00	-6.45-37	-4.33-36	-1.49-35	-4.01-35	-9.45-35	-2.04-34	-4.16-34	-8.14-34	-1.55-33	-2.90-33	-5.37-33	-9.91-33	-1.83-32
22	0.00+00	-6.66-37	-4.66-36	-1.61-35	-4.39-35	-1.04-34	-2.28-34	-4.72-34	-9.41-34	-1.83-33	-3.52-33	-6.73-33	-1.29-32	-2.52-32
21	0.00+00	-6.80-37	-5.01-36	-1.75-35	-4.81-35	-1.16-34	-2.56-34	-5.39-34	-1.10-33	-2.19-33	-4.34-33	-8.64-33	-1.75-32	-3.64-32
20	0.00+00	-6.66-37	-5.30-36	-1.88-35	-5.21-35	-1.27-34	-2.85-34	-6.10-34	-1.27-33	-2.62-33	-5.40-33	-1.13-32	-2.45-32	-5.56-32
19	0.00+00	-6.14-37	-5.50-36	-1.98-35	-5.55-35	-1.37-34	-3.13-34	-6.86-34	-1.47-33	-3.15-33	-6.82-33	-1.52-32	-3.60-32	-9.29-32
18	0.00+00	-5.13-37	-5.58-36	-2.05-35	-5.83-35	-1.46-34	-3.39-34	-7.64-34	-1.70-33	-3.81-33	-8.80-33	-2.14-32	-5.74-32	-1.80-31
17	0.00+00	-3.54-37	-5.53-36	-2.09-35	-6.03-35	-1.53-34	-3.65-34	-8.49-34	-1.97-33	-4.70-33	-1.18-32	-3.25-32	-1.06-31	-4.68-31
16	0.00+00	-1.36-37	-5.40-36	-2.12-35	-6.20-35	-1.60-34	-3.93-34	-9.50-34	-2.34-33	-6.04-33	-1.71-32	-5.70-32	-2.60-31	-2.59-30
15	0.00+00	1.49-37	-5.23-36	-2.15-35	-6.43-35	-1.70-34	-4.29-34	-1.09-33	-2.90-33	-8.43-33	-2.87-32	-1.34-31	-1.37-30	
14	0.00+00	5.21-37	-5.05-36	-2.21-35	-6.77-35	-1.83-34	-4.84-34	-1.32-33	-3.92-33	-1.37-32	-6.52-32	-6.80-31		
13	0.00+00	1.03-36	-4.80-36	-2.29-35	-7.27-35	-2.04-34	-5.68-34	-1.71-33	-6.09-33	-2.96-32	-3.15-31			
12	0.00+00	1.79-36	-4.29-36	-2.37-35	-7.86-35	-2.30-34	-6.93-34	-2.45-33	-1.20-32	-1.30-31				
11	0.00+00	2.97-36	-3.15-36	-2.35-35	-8.28-35	-2.54-34	-8.52-34	-3.97-33	-4.23-32					
10	0.00+00	4.96-36	-4.72-37	-1.96-35	-7.60-35	-2.34-34	-8.00-34	-5.93-33						
9	0.00+00	8.46-36	5.72-36	-4.67-36	-2.17-35	1.23-34	4.50-33							
8	0.00+00	1.50-35	2.04-35	4.55-35	2.72-34	4.67-33								
7	0.00+00	2.81-35	5.83-35	2.48-34	3.04-33									
6	0.00+00	5.85-35	1.89-34	1.92-33										
5	0.00+00	1.56-34	1.17-33											
4	0.00+00	8.05-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-4.67-34	-5.87-34	-7.03-34	-8.05-34	-8.85-34	-9.37-34	-9.58-34	-9.21-34	-8.63-34	-7.62-34	-6.12-34	-4.01-34	-1.15-34	2.67-34
45	-7.21-34	-9.22-34	-1.13-33	-1.32-33	-1.49-33	-1.62-33	-1.72-33	-1.73-33	-1.72-33	-1.64-33	-1.48-33	-1.21-33	-7.97-34	-1.88-34
40	-1.21-33	-1.59-33	-2.00-33	-2.42-33	-2.84-33	-3.23-33	-3.61-33	-3.86-33	-4.13-33	-4.33-33	-4.44-33	-4.39-33	-4.10-33	-3.39-33
35	-2.31-33	-3.16-33	-4.16-33	-5.30-33	-6.58-33	-8.04-33	-9.71-33	-1.15-32	-1.37-32	-1.65-32	-2.01-32	-2.48-32	-3.13-32	-4.06-32
30	-5.37-33	-7.86-33	-1.12-32	-1.57-32	-2.17-32	-3.01-32	-4.24-32	-6.05-32	-9.15-32	-1.48-31	-2.69-31	-5.81-31	-1.74-30	-1.16-29
29	-6.59-33	-9.83-33	-1.44-32	-2.06-32	-2.96-32	-4.27-32	-6.33-32	-9.67-32	-1.60-31	-2.94-31	-6.49-31	-1.98-30	-1.34-29	
28	-8.20-33	-1.25-32	-1.88-32	-2.79-32	-4.17-32	-6.34-32	-1.00-31	-1.68-31	-3.15-31	-7.03-31	-2.19-30	-1.51-29		
27	-1.04-32	-1.63-32	-2.53-32	-3.92-32	-6.15-32	-9.99-32	-1.73-31	-3.27-31	-7.44-31	-2.25-30	-1.64-29			
26	-1.34-32	-2.18-32	-3.52-32	-5.73-32	-9.61-32	-1.70-31	-3.33-31	-7.66-31	-2.46-30	-1.74-29				
25	-1.78-32	-3.00-32	-5.11-32	-8.88-32	-1.62-31	-3.26-31	-7.72-31	-2.51-30	-1.81-29					
24	-2.42-32	-4.31-32	-7.81-32	-1.48-31	-3.07-31	-7.44-31	-2.48-30	-1.82-29						
23	-3.42-32	-6.50-32	-1.29-31	-2.76-31	-6.91-31	-2.35-30	-1.73-29							
22	-5.02-32	-1.04-31	-2.33-31	-6.07-31	-2.14-30	-1.63-29								
21	-7.92-32	-1.86-31	-5.07-31	-1.86-30	-1.47-29									
20	-1.37-31	-3.93-31	-1.51-30	-1.24-29										
19	-2.79-31	-1.13-30	-9.71-30											
18	-7.64-31	-6.94-30												
17	-4.47-30													

HE + TE = 7.50+03 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 2.664-12 4-3 RC = 4.313-13 4-3 EM = 1.828-24 2S RC = 7.949-13 2P RC = 1.869-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.94-03	2.13-03	9.15-04	4.74-04	2.76-04	1.75-04	1.18-04	8.30-05	6.07-05	4.57-05	3.53-05	2.78-05	2.23-05	1.81-05
45	9.58-03	2.94-03	1.26-03	6.55-04	3.82-04	2.42-04	1.63-04	1.15-04	8.38-05	6.31-05	4.87-05	3.84-05	3.07-05	2.50-05
40	1.38-02	4.23-03	1.82-03	9.41-04	5.49-04	3.48-04	2.34-04	1.65-04	1.20-04	9.07-05	7.00-05	5.51-05	4.41-05	3.59-05
35	2.09-02	6.40-03	2.75-03	1.42-03	8.30-04	5.26-04	3.54-04	2.49-04	1.82-04	1.37-04	1.06-04	8.32-05	6.67-05	5.42-05
30	3.37-02	1.03-02	4.44-03	2.30-03	1.34-03	8.49-04	5.71-04	4.02-04	2.94-04	2.21-04	1.70-04	1.34-04	1.07-04	8.73-05
29	3.75-02	1.15-02	4.94-03	2.56-03	1.49-03	9.44-04	6.35-04	4.47-04	3.26-04	2.46-04	1.89-04	1.49-04	1.19-04	9.69-05
28	4.18-02	1.28-02	5.51-03	2.85-03	1.66-03	1.05-03	7.08-04	4.98-04	3.64-04	2.74-04	2.11-04	1.66-04	1.33-04	1.08-04
27	4.69-02	1.44-02	6.17-03	3.20-03	1.86-03	1.18-03	7.92-04	5.58-04	4.07-04	3.06-04	2.36-04	1.86-04	1.49-04	1.21-04
26	5.27-02	1.62-02	6.94-03	3.59-03	2.09-03	1.33-03	8.91-04	6.27-04	4.58-04	3.44-04	2.65-04	2.09-04	1.67-04	1.35-04
25	5.95-02	1.82-02	7.84-03	4.06-03	2.36-03	1.50-03	1.01-03	7.08-04	5.16-04	3.88-04	2.99-04	2.35-04	1.88-04	1.53-04
24	6.75-02	2.07-02	8.88-03	4.60-03	2.68-03	1.69-03	1.14-03	8.02-04	5.85-04	4.40-04	3.39-04	2.66-04	2.13-04	1.72-04
23	7.68-02	2.36-02	1.01-02	5.23-03	3.05-03	1.93-03	1.30-03	9.12-04	6.65-04	5.00-04	3.85-04	3.02-04	2.41-04	1.96-04
22	8.78-02	2.69-02	1.16-02	5.98-03	3.48-03	2.20-03	1.48-03	1.04-03	7.59-04	5.70-04	4.39-04	3.44-04	2.75-04	2.23-04
21	1.01-01	3.09-02	1.32-02	6.85-03	3.99-03	2.52-03	1.70-03	1.19-03	8.69-04	6.53-04	5.02-04	3.94-04	3.14-04	2.54-04
20	1.15-01	3.54-02	1.52-02	7.86-03	4.58-03	2.89-03	1.94-03	1.37-03	9.95-04	7.47-04	5.74-04	4.50-04	3.58-04	2.89-04
19	1.33-01	4.07-02	1.75-02	9.03-03	5.26-03	3.32-03	2.23-03	1.57-03	1.14-03	8.56-04	6.57-04	5.14-04	4.08-04	3.28-04
18	1.52-01	4.67-02	2.00-02	1.04-02	6.03-03	3.81-03	2.56-03	1.79-03	1.31-03	9.79-04	7.50-04	5.85-04	4.63-04	3.69-04
17	1.74-01	5.32-02	2.28-02	1.18-02	6.87-03	4.34-03	2.91-03	2.04-03	1.49-03	1.11-03	8.50-04	6.61-04	5.19-04	4.07-04
16	1.96-01	6.00-02	2.58-02	1.33-02	7.75-03	4.89-03	3.28-03	2.30-03	1.67-03	1.25-03	9.49-04	7.33-04	5.66-04	4.17-04
15	2.18-01	6.67-02	2.86-02	1.48-02	8.59-03	5.42-03	3.63-03	2.54-03	1.84-03	1.37-03	1.04-03	7.87-04	5.72-04	
14	2.37-01	7.25-02	3.11-02	1.61-02	9.35-03	5.89-03	3.94-03	2.76-03	1.99-03	1.47-03	1.09-03	7.81-04		
13	2.54-01	7.78-02	3.34-02	1.72-02	1.00-02	6.31-03	4.21-03	2.93-03	2.10-03	1.53-03	1.07-03			
12	2.73-01	8.36-02	3.59-02	1.85-02	1.08-02	6.77-03	4.51-03	3.12-03	2.20-03	1.51-03				
11	3.01-01	9.23-02	3.96-02	2.05-02	1.19-02	7.46-03	4.94-03	3.37-03	2.24-03					
10	3.46-01	1.06-01	4.58-02	2.37-02	1.37-02	8.58-03	5.60-03	3.61-03						
9	4.15-01	1.28-01	5.55-02	2.88-02	1.67-02	1.03-02	6.37-03							
8	5.20-01	1.62-01	7.07-02	3.68-02	2.12-02	1.25-02								
7	6.80-01	2.16-01	9.59-02	5.03-02	2.79-02									
6	9.51-01	3.11-01	1.42-01	7.31-02										
5	1.51+00	5.11-01	2.34-01											
4	2.97+00	1.00+00												
3	8.27+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.49-05	1.25-05	1.05-05	8.94-06	7.67-06	6.63-06	5.76-06	5.04-06	4.44-06	3.93-06	3.49-06	3.12-06	2.79-06	2.51-06
45	2.06-05	1.72-05	1.45-05	1.23-05	1.06-05	9.14-06	7.95-06	6.95-06	6.12-06	5.41-06	4.81-06	4.29-06	3.84-06	3.45-06
40	2.96-05	2.47-05	2.08-05	1.77-05	1.52-05	1.31-05	1.14-05	9.96-06	8.75-06	7.74-06	6.87-06	6.12-06	5.48-06	4.92-06
35	4.47-05	3.72-05	3.14-05	2.67-05	2.28-05	1.97-05	1.71-05	1.49-05	1.31-05	1.16-05	1.03-05	9.13-06	8.14-06	7.28-06
30	7.19-05	5.99-05	5.04-05	4.27-05	3.66-05	3.15-05	2.73-05	2.38-05	2.08-05	1.82-05	1.60-05	1.40-05	1.21-05	9.84-06
29	7.98-05	6.64-05	5.59-05	4.74-05	4.05-05	3.49-05	3.02-05	2.62-05	2.29-05	2.00-05	1.74-05	1.50-05	1.22-05	
28	8.89-05	7.40-05	6.22-05	5.27-05	4.50-05	3.87-05	3.34-05	2.90-05	2.52-05	2.18-05	1.87-05	1.51-05		
27	9.93-05	8.26-05	6.94-05	5.88-05	5.02-05	4.31-05	3.71-05	3.21-05	2.77-05	2.36-05	1.90-05			
26	1.11-04	9.26-05	7.77-05	6.58-05	5.60-05	4.80-05	4.12-05	3.53-05	2.99-05	2.40-05				
25	1.25-04	1.04-04	8.74-05	7.38-05	6.27-05	5.35-05	4.56-05	3.84-05	3.06-05					
24	1.42-04	1.18-04	9.84-05	8.29-05	7.02-05	5.94-05	4.98-05	3.95-05						
23	1.60-04	1.33-04	1.11-04	9.32-05	7.83-05	6.52-05	5.13-05							
22	1.82-04	1.51-04	1.25-04	1.04-04	8.62-05	6.75-05								
21	2.07-04	1.71-04	1.41-04	1.15-04	8.96-05									
20	2.35-04	1.92-04	1.56-04	1.20-04										
19	2.65-04	2.13-04	1.63-04											
18	2.93-04	2.22-04												
17	3.04-04													

HE + TE = 7.50+03 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.37-31	-6.52-38	-4.31-37	-1.40-36	-3.50-36	-7.52-36	-1.45-35	-2.55-35	-4.15-35	-6.23-35	-8.50-35	-1.03-34	-1.09-34	-9.74-35
45	1.88-31	-9.12-38	-6.01-37	-1.96-36	-4.92-36	-1.06-35	-2.06-35	-3.65-35	-5.99-35	-9.09-35	-1.26-34	-1.55-34	-1.67-34	-1.54-34
40	2.68-31	-1.33-37	-8.75-37	-2.86-36	-7.24-36	-1.57-35	-3.07-35	-5.51-35	-9.16-35	-1.41-34	-1.98-34	-2.50-34	-2.78-34	-2.67-34
35	4.01-31	-2.07-37	-1.35-36	-4.43-36	-1.13-35	-2.49-35	-4.93-35	-8.97-35	-1.52-34	-2.39-34	-3.44-34	-4.48-34	-5.19-34	-5.31-34
30	6.40-31	-3.45-37	-2.24-36	-7.43-36	-1.92-35	-4.30-35	-8.70-35	-1.62-34	-2.83-34	-4.59-34	-6.90-34	-9.44-34	-1.17-33	-1.31-33
29	7.09-31	-3.86-37	-2.51-36	-8.34-36	-2.17-35	-4.87-35	-9.89-35	-1.86-34	-3.26-34	-5.35-34	-8.13-34	-1.13-33	-1.42-33	-1.62-33
28	7.89-31	-4.34-37	-2.82-36	-9.40-36	-2.45-35	-5.54-35	-1.13-34	-2.14-34	-3.79-34	-6.29-34	-9.67-34	-1.36-33	-1.75-33	-2.05-33
27	8.82-31	-4.90-37	-3.18-36	-1.06-35	-2.79-35	-6.34-35	-1.30-34	-2.49-34	-4.45-34	-7.46-34	-1.16-33	-1.67-33	-2.19-33	-2.64-33
26	9.89-31	-5.56-37	-3.61-36	-1.21-35	-3.19-35	-7.30-35	-1.51-34	-2.92-34	-5.27-34	-8.96-34	-1.42-33	-2.08-33	-2.79-33	-3.48-33
25	1.11-30	-6.33-37	-4.11-36	-1.39-35	-3.68-35	-8.47-35	-1.77-34	-3.45-34	-6.31-34	-1.09-33	-1.76-33	-2.63-33	-3.64-33	-4.70-33
24	1.26-30	-7.25-37	-4.71-36	-1.60-35	-4.26-35	-9.89-35	-2.09-34	-4.12-34	-7.65-34	-1.34-33	-2.21-33	-3.40-33	-4.86-33	-6.54-33
23	1.44-30	-8.32-37	-5.42-36	-1.85-35	-4.97-35	-1.16-34	-2.49-34	-4.97-34	-9.39-34	-1.68-33	-2.84-33	-4.50-33	-6.68-33	-9.46-33
22	1.65-30	-9.58-37	-6.27-36	-2.15-35	-5.83-35	-1.38-34	-2.99-34	-6.07-34	-1.17-33	-2.15-33	-3.74-33	-6.13-33	-9.54-33	-1.43-32
21	1.90-30	-1.10-36	-7.27-36	-2.52-35	-6.89-35	-1.65-34	-3.63-34	-7.52-34	-1.48-33	-2.80-33	-5.04-33	-8.65-33	-1.42-32	-2.30-32
20	2.21-30	-1.27-36	-8.44-36	-2.95-35	-8.16-35	-1.99-34	-4.45-34	-9.40-34	-1.90-33	-3.72-33	-7.00-33	-1.27-32	-2.24-32	-3.98-32
19	2.58-30	-1.45-36	-9.82-36	-3.47-35	-9.73-35	-2.41-34	-5.51-34	-1.20-33	-2.51-33	-5.11-33	-1.01-32	-1.97-32	-3.82-32	-7.76-32
18	3.05-30	-1.64-36	-1.14-35	-4.08-35	-1.16-34	-2.93-34	-6.89-34	-1.54-33	-3.37-33	-7.25-33	-1.54-32	-3.29-32	-7.27-32	-1.81-31
17	3.65-30	-1.82-36	-1.31-35	-4.77-35	-1.39-34	-3.58-34	-8.67-34	-2.02-33	-4.66-33	-1.07-32	-2.50-32	-6.08-32	-1.64-31	-5.79-31
16	4.40-30	-1.94-36	-1.48-35	-5.51-35	-1.64-34	-4.36-34	-1.10-33	-2.69-33	-6.62-33	-1.67-32	-4.45-32	-1.32-31	-5.07-31	-4.05-30
15	5.39-30	-1.93-36	-1.63-35	-6.24-35	-1.90-34	-5.25-34	-1.39-33	-3.63-33	-9.77-33	-2.81-32	-9.15-32	-3.86-31	-3.36-30	
14	6.70-30	-1.69-36	-1.73-35	-6.85-35	-2.16-34	-6.24-34	-1.75-33	-5.00-33	-1.53-32	-5.37-32	-2.49-31	-2.39-30		
13	8.47-30	-1.16-36	-1.76-35	-7.30-35	-2.40-34	-7.32-34	-2.23-33	-7.19-33	-2.67-32	-1.33-31	-1.40-30			
12	1.09-29	-2.63-37	-1.72-35	-7.66-35	-2.66-34	-8.72-34	-2.97-33	-1.16-32	-6.04-32	-6.80-31				
11	1.45-29	1.03-36	-1.67-35	-8.18-35	-3.05-34	-1.11-33	-4.52-33	-2.45-32	-2.86-31					
10	1.98-29	2.95-36	-1.62-35	-9.16-35	-3.79-34	-1.63-33	-9.15-33	-1.10-31						
9	2.83-29	6.10-36	-1.52-35	-1.09-34	-5.30-34	-3.10-33	-3.80-32							
8	4.24-29	1.20-35	-1.12-35	-1.33-34	-8.75-34	-1.07-32								
7	6.84-29	2.48-35	5.92-36	-1.39-34	-1.69-33									
6	1.23-28	5.71-35	8.69-35	4.85-34										
5	2.63-28	1.64-34	7.86-34											
4	7.87-28	8.56-34												
3	5.71-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-6.56-35	-1.35-35	5.92-35	1.53-34	2.71-34	4.21-34	5.97-34	8.11-34	1.07-33	1.39-33	1.78-33	2.26-33	2.85-33	3.59-33
45	-1.11-34	-3.73-35	6.99-35	2.13-34	3.97-34	6.39-34	9.33-34	1.30-33	1.77-33	2.36-33	3.12-33	4.10-33	5.37-33	7.04-33
40	-2.10-34	-1.01-34	6.59-35	3.00-34	6.16-34	1.05-33	1.61-33	2.35-33	3.35-33	4.69-33	6.53-33	9.10-33	1.28-32	1.81-32
35	-4.65-34	-3.03-34	-2.50-35	4.00-34	1.02-33	1.96-33	3.27-33	5.18-33	8.04-33	1.24-32	1.93-32	3.06-32	5.03-32	8.68-32
30	-1.31-33	-1.12-33	-6.70-34	1.85-34	1.68-33	4.39-33	8.98-33	1.74-32	3.36-32	6.79-32	1.51-31	3.94-31	1.42-30	1.13-29
29	-1.68-33	-7.53-33	-1.05-33	-7.04-35	1.76-33	5.31-33	1.17-32	2.45-32	5.20-32	1.19-31	3.19-31	1.17-30	9.45-30	
28	-2.20-33	-2.11-33	-1.65-33	-5.50-34	1.70-33	6.47-33	1.59-32	3.69-32	8.92-32	2.48-31	9.36-31	7.69-30		
27	-2.95-33	-3.00-33	-2.63-33	-1.46-33	1.29-33	7.88-33	2.26-32	6.10-32	1.81-31	7.11-31	6.02-30			
26	-4.05-33	-4.39-33	-4.28-33	-3.22-33	-1.83-35	9.33-33	3.44-32	1.17-31	4.98-31	4.44-30				
25	-5.74-33	-6.66-33	-7.23-33	-6.85-33	-3.71-33	9.59-33	5.74-32	2.98-31	2.94-30					
24	-8.44-33	-1.06-32	-1.29-32	-1.49-32	-1.46-32	1.94-33	1.11-31	1.54-30						
23	-1.30-32	-1.78-32	-2.47-32	-3.51-32	-5.17-32	-6.26-32	2.29-31							
22	-2.13-32	-3.26-32	-5.29-32	-9.70-32	-2.27-31	-9.70-31								
21	-3.79-32	-6.69-32	-1.36-31	-3.67-31	-2.05-30									
20	-7.51-32	-1.63-31	-4.74-31	-2.97-30										
19	-1.79-31	-5.56-31	-3.72-30											
18	-5.94-31	-4.19-30												
17	-4.32-30													

HE + TE = 7.50+03 NE = 1.00+11 CASE B NC = 20

TOTAL RC = 3.453-12 4-3 RC = 5.111-13 4-3 EM = 2.166-24 2S RC = 9.944-13 2P RC = 2.459-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.85-03	1.80-03	7.72-04	4.00-04	2.33-04	1.48-04	9.94-05	7.01-05	5.12-05	3.86-05	2.98-05	2.35-05	1.88-05	1.53-05
45	8.09-03	2.48-03	1.07-03	5.53-04	3.22-04	2.04-04	1.37-04	9.68-05	7.08-05	5.33-05	4.11-05	3.24-05	2.60-05	2.11-05
40	1.16-02	3.57-03	1.54-03	7.95-04	4.64-04	2.94-04	1.98-04	1.39-04	1.02-04	7.66-05	5.91-05	4.66-05	3.73-05	3.04-05
35	1.77-02	5.42-03	2.33-03	1.21-03	7.03-04	4.45-04	2.99-04	2.11-04	1.54-04	1.16-04	8.95-05	7.04-05	5.64-05	4.59-05
30	2.87-02	8.80-03	3.78-03	1.96-03	1.14-03	7.23-04	4.86-04	3.42-04	2.50-04	1.88-04	1.45-04	1.14-04	9.14-05	7.43-05
29	3.20-02	9.81-03	4.21-03	2.18-03	1.27-03	8.05-04	5.41-04	3.81-04	2.78-04	2.09-04	1.61-04	1.27-04	1.02-04	8.26-05
28	3.58-02	1.10-02	4.71-03	2.44-03	1.42-03	9.00-04	6.05-04	4.26-04	3.11-04	2.34-04	1.80-04	1.42-04	1.14-04	9.23-05
27	4.02-02	1.23-02	5.29-03	2.74-03	1.60-03	1.01-03	6.79-04	4.78-04	3.49-04	2.63-04	2.02-04	1.59-04	1.27-04	1.03-04
26	4.54-02	1.39-02	5.97-03	3.09-03	1.80-03	1.14-03	7.67-04	5.40-04	3.94-04	2.96-04	2.28-04	1.79-04	1.44-04	1.17-04
25	5.15-02	1.58-02	6.78-03	3.51-03	2.04-03	1.29-03	8.69-04	6.12-04	4.47-04	3.36-04	2.59-04	2.03-04	1.63-04	1.32-04
24	5.87-02	1.80-02	7.73-03	4.00-03	2.33-03	1.48-03	9.92-04	6.98-04	5.09-04	3.83-04	2.95-04	2.32-04	1.85-04	1.50-04
23	6.75-02	2.07-02	8.88-03	4.59-03	2.68-03	1.69-03	1.14-03	8.01-04	5.84-04	4.39-04	3.38-04	2.65-04	2.12-04	1.72-04
22	7.80-02	2.39-02	1.03-02	5.31-03	3.09-03	1.96-03	1.31-03	9.24-04	6.74-04	5.06-04	3.90-04	3.06-04	2.44-04	1.98-04
21	9.08-02	2.78-02	1.19-02	6.18-03	3.60-03	2.28-03	1.53-03	1.07-03	7.84-04	5.88-04	4.52-04	3.55-04	2.83-04	2.29-04
20	1.06-01	3.26-02	1.40-02	7.24-03	4.22-03	2.67-03	1.79-03	1.26-03	9.17-04	6.88-04	5.29-04	4.14-04	3.30-04	2.66-04
19	1.26-01	3.86-02	1.66-02	8.56-03	4.99-03	3.15-03	2.12-03	1.49-03	1.08-03	8.12-04	6.23-04	4.87-04	3.87-04	3.11-04
18	1.50-01	4.60-02	1.98-02	1.02-02	5.94-03	3.75-03	2.52-03	1.77-03	1.29-03	9.64-04	7.39-04	5.77-04	4.56-04	3.64-04
17	1.81-01	5.54-02	2.38-02	1.23-02	7.14-03	4.51-03	3.02-03	2.12-03	1.54-03	1.15-03	8.82-04	6.85-04	5.38-04	4.22-04
16	2.19-01	6.71-02	2.88-02	1.49-02	8.65-03	5.46-03	3.66-03	2.56-03	1.86-03	1.39-03	1.06-03	8.15-04	6.29-04	4.64-04
15	2.67-01	8.18-02	3.51-02	1.81-02	1.05-02	6.64-03	4.44-03	3.11-03	2.25-03	1.67-03	1.26-03	9.59-04	6.96-04	
14	3.26-01	9.99-02	4.28-02	2.21-02	1.28-02	8.08-03	5.40-03	3.77-03	2.72-03	2.01-03	1.49-03	1.06-03		
13	3.96-01	1.21-01	5.19-02	2.67-02	1.55-02	9.76-03	6.51-03	4.52-03	3.24-03	2.35-03	1.64-03			
12	4.70-01	1.44-01	6.15-02	3.17-02	1.84-02	1.15-02	7.65-03	5.28-03	3.72-03	2.54-03				
11	5.37-01	1.64-01	7.02-02	3.61-02	2.09-02	1.31-02	8.62-03	5.85-03	3.88-03					
10	5.87-01	1.79-01	7.66-02	3.94-02	2.27-02	1.41-02	9.14-03	5.84-03						
9	6.33-01	1.93-01	8.25-02	4.23-02	2.42-02	1.48-02	9.05-03							
8	7.18-01	2.19-01	9.34-02	4.76-02	2.69-02	1.55-02								
7	8.88-01	2.71-01	1.15-01	5.81-02	3.10-02									
6	1.21+00	3.69-01	1.56-01	7.51-02										
5	1.84+00	5.64-01	2.31-01											
4	3.41+00	1.00+00												
3	8.79+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.26-05	1.05-05	8.87-06	7.55-06	6.47-06	5.59-06	4.87-06	4.26-06	3.75-06	3.32-06	2.95-06	2.63-06	2.36-06	2.12-06
45	1.74-05	1.45-05	1.22-05	1.04-05	8.93-06	7.72-06	6.71-06	5.87-06	5.17-06	4.57-06	4.06-06	3.62-06	3.24-06	2.92-06
40	2.50-05	2.09-05	1.76-05	1.50-05	1.28-05	1.11-05	9.62-06	8.41-06	7.40-06	6.54-06	5.81-06	5.18-06	4.63-06	4.16-06
35	3.78-05	3.15-05	2.66-05	2.26-05	1.93-05	1.67-05	1.45-05	1.27-05	1.11-05	9.81-06	8.69-06	7.73-06	6.90-06	6.16-06
30	6.12-05	5.09-05	4.29-05	3.64-05	3.11-05	2.68-05	2.32-05	2.02-05	1.77-05	1.55-05	1.36-05	1.19-05	1.03-05	8.37-06
29	6.80-05	5.66-05	4.76-05	4.04-05	3.45-05	2.97-05	2.57-05	2.24-05	1.95-05	1.70-05	1.48-05	1.28-05	1.04-05	
28	7.59-05	6.32-05	5.31-05	4.50-05	3.85-05	3.31-05	2.86-05	2.48-05	2.15-05	1.87-05	1.60-05	1.29-05		
27	8.51-05	7.08-05	5.95-05	5.04-05	4.30-05	3.69-05	3.18-05	2.75-05	2.37-05	2.02-05	1.63-05			
26	9.59-05	7.97-05	6.69-05	5.66-05	4.82-05	4.13-05	3.55-05	3.04-05	2.58-05	2.07-05				
25	1.08-04	9.01-05	7.56-05	6.38-05	5.42-05	4.63-05	3.94-05	3.32-05	2.65-05					
24	1.23-04	1.02-04	8.57-05	7.22-05	6.11-05	5.17-05	4.33-05	3.44-05						
23	1.41-04	1.17-04	9.75-05	8.19-05	6.88-05	5.72-05	4.51-05							
22	1.62-04	1.34-04	1.11-04	9.27-05	7.66-05	5.99-05								
21	1.87-04	1.54-04	1.27-04	1.04-04	8.08-05									
20	2.16-04	1.77-04	1.44-04	1.11-04										
19	2.51-04	2.02-04	1.54-04											
18	2.89-04	2.18-04												
17	3.15-04													

HE + TE = 7.50+03 NE = 1.00+11 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.77-31	-5.98-38	-4.02-37	-1.26-36	-3.05-36	-6.16-36	-1.05-35	-1.44-35	-1.32-35	-1.30-36	2.30-35	5.88-35	1.05-34	1.61-34
45	2.44-31	-8.38-38	-5.62-37	-1.77-36	-4.29-36	-8.73-36	-1.51-35	-2.09-35	-1.96-35	-3.21-36	3.13-35	8.29-35	1.51-34	2.35-34
40	3.47-31	-1.23-37	-8.20-37	-2.59-36	-6.33-36	-1.30-35	-2.27-35	-3.20-35	-3.11-35	-7.75-36	4.35-35	1.22-34	2.28-34	3.64-34
35	5.20-31	-1.92-37	-1.27-36	-4.04-36	-9.96-36	-2.07-35	-3.67-35	-5.32-35	-5.43-35	-1.97-35	6.18-35	1.92-34	3.74-34	6.17-34
30	8.30-31	-3.24-37	-2.12-36	-6.84-36	-1.71-35	-3.63-35	-6.62-35	-9.94-35	-1.09-34	-5.64-35	8.46-35	3.27-34	6.88-34	1.20-33
29	9.20-31	-3.65-37	-2.39-36	-7.70-36	-1.94-35	-4.13-35	-7.57-35	-1.15-34	-1.28-34	-7.12-35	8.82-35	3.68-34	7.93-34	1.41-33
28	1.02-30	-4.13-37	-2.69-36	-8.71-36	-2.20-35	-4.72-35	-8.72-35	-1.34-34	-1.52-34	-9.07-35	9.03-35	4.16-34	9.20-34	1.67-33
27	1.14-30	-4.70-37	-3.05-36	-9.92-36	-2.52-35	-5.44-35	-1.01-34	-1.57-34	-1.83-34	-1.17-34	8.96-35	4.71-34	1.08-33	2.00-33
26	1.28-30	-5.37-37	-3.48-36	-1.14-35	-2.90-35	-6.31-35	-1.19-34	-1.87-34	-2.22-34	-1.53-34	8.40-35	5.36-34	1.27-33	2.43-33
25	1.44-30	-6.19-37	-4.00-36	-1.31-35	-3.37-35	-7.38-35	-1.40-34	-2.24-34	-2.74-34	-2.02-34	7.00-35	6.11-34	1.53-33	3.01-33
24	1.64-30	-7.17-37	-4.63-36	-1.52-35	-3.94-35	-8.73-35	-1.68-34	-2.73-34	-3.43-34	-2.72-34	4.16-35	6.96-34	1.85-33	3.81-33
23	1.86-30	-8.38-37	-5.39-36	-1.79-35	-4.66-35	-1.04-34	-2.03-34	-3.37-34	-4.36-34	-3.73-34	-1.20-35	7.89-34	2.28-33	4.94-33
22	2.14-30	-9.88-37	-6.34-36	-2.11-35	-5.57-35	-1.26-34	-2.50-34	-4.23-34	-5.67-34	-5.22-34	-1.11-34	8.83-34	2.85-33	6.62-33
21	2.46-30	-1.17-36	-7.52-36	-2.53-35	-6.73-35	-1.54-34	-3.12-34	-5.41-34	-7.54-34	-7.52-34	-2.91-34	9.55-34	3.63-33	9.25-33
20	2.86-30	-1.41-36	-9.00-36	-3.05-35	-8.23-35	-1.92-34	-3.96-34	-7.07-34	-1.03-33	-1.11-33	-6.23-34	9.57-34	4.75-33	1.37-32
19	3.35-30	-1.71-36	-1.09-35	-3.74-35	-1.02-34	-2.43-34	-5.14-34	-9.49-34	-1.45-33	-1.72-33	-1.28-33	7.01-34	6.30-33	2.21-32
18	3.96-30	-2.09-36	-1.34-35	-4.64-35	-1.29-34	-3.14-34	-6.84-34	-1.31-33	-2.13-33	-2.78-33	-2.62-33	-2.96-34	8.36-33	4.03-32
17	4.73-30	-2.58-36	-1.66-35	-5.84-35	-1.66-34	-4.15-34	-9.36-34	-1.89-33	-3.28-33	-4.78-33	-5.61-33	-3.69-33	9.94-33	9.32-32
16	5.71-30	-3.22-36	-2.08-35	-7.46-35	-2.17-34	-5.62-34	-1.33-33	-2.84-33	-5.37-33	-8.90-33	-1.31-32	-1.63-32	-5.19-34	3.85-31
15	6.99-30	-4.02-36	-2.64-35	-9.66-35	-2.91-34	-7.82-34	-1.95-33	-4.51-33	-9.50-33	-1.86-32	-3.62-32	-7.96-32	-2.54-31	
14	8.68-30	-5.01-36	-3.36-35	-1.27-34	-3.96-34	-1.12-33	-3.00-33	-7.67-33	-1.87-32	-4.62-32	-1.36-31	-7.71-31		
13	1.10-29	-6.12-36	-4.26-35	-1.66-34	-5.46-34	-1.66-33	-4.89-33	-1.44-32	-4.36-32	-1.57-31	-1.10-30			
12	1.42-29	-7.09-36	-5.28-35	-2.17-34	-7.58-34	-2.52-33	-8.51-33	-3.09-32	-1.36-31	-1.14-30				
11	1.88-29	-7.38-36	-6.24-35	-2.73-34	-1.04-33	-3.95-33	-1.64-32	-8.59-32	-6.75-31					
10	2.57-29	-6.18-36	-6.86-35	-3.28-34	-1.42-33	-6.53-33	-3.88-32	-4.69-31						
9	3.66-29	-2.97-36	-7.12-35	-3.90-34	-2.02-33	-1.31-32	-1.77-31							
8	5.50-29	2.66-36	-7.52-35	-5.10-34	-3.67-33	-5.28-32								
7	8.87-29	1.34-35	-8.61-35	-8.65-34	-1.37-32									
6	1.59-28	4.02-35	-1.05-34	-2.72-33										
5	3.41-28	1.36-34	-2.84-35											
4	1.02-27	8.02-34												
3	7.40-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.29-34	3.09-34	4.05-34	5.18-34	6.54-34	8.19-34	1.02-33	1.25-33	1.54-33	1.89-33	2.31-33	2.83-33	3.48-33	4.28-33
45	3.38-34	4.62-34	6.14-34	7.99-34	1.02-33	1.31-33	1.65-33	2.08-33	2.62-33	3.29-33	4.15-33	5.25-33	6.68-33	8.54-33
40	5.33-34	7.46-34	1.01-33	1.35-33	1.77-33	2.32-33	3.03-33	3.95-33	5.17-33	6.80-33	9.01-33	1.21-32	1.64-32	2.26-32
35	9.33-34	1.35-33	1.90-33	2.63-33	3.61-33	4.97-33	6.86-33	9.53-33	1.34-32	1.93-32	2.83-32	4.30-32	6.81-32	1.14-31
30	1.93-33	2.95-33	4.44-33	6.63-33	9.95-33	1.52-32	2.38-32	3.85-32	6.59-32	1.22-31	2.51-31	6.22-31	2.14-30	1.64-29
29	2.29-33	3.58-33	5.49-33	8.40-33	1.30-32	2.06-32	3.37-32	5.79-32	1.07-31	2.23-31	5.54-31	1.92-30	1.48-29	
28	2.77-33	4.42-33	6.94-33	1.09-32	1.75-32	2.91-32	5.05-32	9.42-32	1.97-31	4.91-31	1.71-30	1.32-29		
27	3.40-33	5.56-33	9.01-33	1.47-32	2.47-32	4.34-32	8.19-32	1.72-31	4.32-31	1.51-30	1.17-29			
26	4.25-33	7.18-33	1.21-32	2.06-32	3.68-32	7.02-32	1.49-31	3.77-31	1.32-30	1.03-29				
25	5.45-33	9.56-33	1.68-32	3.06-32	5.92-32	1.27-31	3.25-31	1.15-30	8.99-30					
24	7.18-33	1.32-32	2.48-32	4.90-32	1.07-31	2.76-31	9.85-31	7.76-30						
23	9.83-33	1.93-32	3.93-32	8.76-32	2.30-31	8.31-31	6.62-30							
22	1.41-32	3.03-32	6.96-32	1.87-31	6.87-31	5.54-30								
21	2.17-32	5.28-32	1.47-31	5.54-31	4.56-30									
20	3.70-32	1.09-31	4.29-31	3.62-30										
19	7.36-32	3.09-31	2.72-30											
18	1.97-31	1.89-30												
17	1.10-30													

HE + TE = 7.50+03 NE = 1.00+12 CASE B NC = 20

TOTAL RC = 5.308-12 4-3 RC = 7.849-13 4-3 EM = 3.327-24 2S RC = 1.272-12 2P RC = 4.036-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.81-03	1.17-03	5.03-04	2.60-04	1.52-04	9.62-05	6.47-05	4.56-05	3.34-05	2.51-05	1.94-05	1.52-05	1.22-05	9.96-06
45	5.27-03	1.62-03	6.95-04	3.60-04	2.10-04	1.33-04	8.95-05	6.31-05	4.61-05	3.47-05	2.68-05	2.11-05	1.69-05	1.38-05
40	7.59-03	2.33-03	1.00-03	5.18-04	3.02-04	1.91-04	1.29-04	9.07-05	6.63-05	4.99-05	3.85-05	3.03-05	2.43-05	1.98-05
35	1.15-02	3.53-03	1.52-03	7.85-04	4.58-04	2.90-04	1.95-04	1.37-04	1.00-04	7.56-05	5.83-05	4.59-05	3.68-05	2.99-05
30	1.87-02	5.74-03	2.47-03	1.28-03	7.45-04	4.71-04	3.17-04	2.23-04	1.63-04	1.23-04	9.46-05	7.44-05	5.96-05	4.84-05
29	2.09-02	6.40-03	2.75-03	1.42-03	8.29-04	5.25-04	3.53-04	2.49-04	1.82-04	1.37-04	1.05-04	8.29-05	6.63-05	5.39-05
28	2.33-02	7.16-03	3.07-03	1.59-03	9.28-04	5.87-04	3.95-04	2.78-04	2.03-04	1.53-04	1.18-04	9.26-05	7.41-05	6.02-05
27	2.62-02	8.05-03	3.46-03	1.79-03	1.04-03	6.60-04	4.44-04	3.12-04	2.28-04	1.72-04	1.32-04	1.04-04	8.32-05	6.76-05
26	2.96-02	9.09-03	3.90-03	2.02-03	1.18-03	7.45-04	5.01-04	3.53-04	2.57-04	1.94-04	1.49-04	1.17-04	9.38-05	7.62-05
25	3.37-02	1.03-02	4.43-03	2.29-03	1.34-03	8.46-04	5.69-04	4.00-04	2.92-04	2.20-04	1.69-04	1.33-04	1.06-04	8.63-05
24	3.85-02	1.18-02	5.07-03	2.62-03	1.53-03	9.66-04	6.50-04	4.57-04	3.34-04	2.51-04	1.93-04	1.52-04	1.21-04	9.84-05
23	4.43-02	1.36-02	5.83-03	3.01-03	1.76-03	1.11-03	7.47-04	5.25-04	3.83-04	2.88-04	2.22-04	1.74-04	1.39-04	1.13-04
22	5.13-02	1.57-02	6.75-03	3.49-03	2.03-03	1.29-03	8.64-04	6.08-04	4.44-04	3.33-04	2.56-04	2.01-04	1.61-04	1.30-04
21	5.99-02	1.84-02	7.88-03	4.08-03	2.38-03	1.50-03	1.01-03	7.09-04	5.17-04	3.88-04	2.99-04	2.34-04	1.87-04	1.51-04
20	7.06-02	2.16-02	9.29-03	4.80-03	2.80-03	1.77-03	1.19-03	8.34-04	6.08-04	4.56-04	3.51-04	2.75-04	2.19-04	1.76-04
19	8.41-02	2.58-02	1.11-02	5.72-03	3.33-03	2.10-03	1.41-03	9.92-04	7.22-04	5.42-04	4.16-04	3.25-04	2.58-04	2.07-04
18	1.01-01	3.10-02	1.33-02	6.88-03	4.00-03	2.53-03	1.70-03	1.19-03	8.67-04	6.49-04	4.98-04	3.88-04	3.07-04	2.45-04
17	1.24-01	3.78-02	1.62-02	8.39-03	4.88-03	3.06-03	2.07-03	1.45-03	1.05-03	7.88-04	6.02-04	4.68-04	3.67-04	2.88-04
16	1.53-01	4.68-02	2.01-02	1.04-02	6.03-03	3.81-03	2.55-03	1.79-03	1.30-03	9.67-04	7.36-04	5.68-04	4.38-04	3.23-04
15	1.92-01	5.89-02	2.52-02	1.30-02	7.57-03	4.77-03	3.19-03	2.23-03	1.62-03	1.20-03	9.08-04	6.89-04	5.00-04	
14	2.46-01	7.53-02	3.23-02	1.66-02	9.67-03	6.09-03	4.07-03	2.84-03	2.05-03	1.51-03	1.12-03	8.00-04		
13	3.21-01	9.82-02	4.20-02	2.17-02	1.26-02	7.90-03	5.27-03	3.66-03	2.62-03	1.90-03	1.33-03			
12	4.26-01	1.30-01	5.57-02	2.87-02	1.66-02	1.04-02	6.92-03	4.78-03	3.36-03	2.29-03				
11	5.73-01	1.75-01	7.48-02	3.85-02	2.22-02	1.39-02	9.14-03	6.20-03	4.10-03					
10	7.68-01	2.34-01	1.00-01	5.13-02	2.95-02	1.83-02	1.19-02	7.56-03						
9	9.92-01	3.02-01	1.29-01	6.57-02	3.75-02	2.29-02	1.39-02							
8	1.17+00	3.56-01	1.51-01	7.67-02	4.31-02	2.47-02								
7	1.28+00	3.88-01	1.63-01	8.16-02	4.32-02									
6	1.49+00	4.48-01	1.86-01	8.77-02										
5	2.06+00	6.12-01	2.40-01											
4	3.56+00	1.00+00												
3	8.79+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.22-06	6.86-06	5.78-06	4.92-06	4.22-06	3.64-06	3.17-06	2.77-06	2.44-06	2.16-06	1.92-06	1.71-06	1.53-06	1.38-06
45	1.13-05	9.46-06	7.98-06	6.78-06	5.82-06	5.02-06	4.37-06	3.82-06	3.36-06	2.97-06	2.64-06	2.36-06	2.11-06	1.90-06
40	1.63-05	1.36-05	1.15-05	9.74-06	8.35-06	7.21-06	6.27-06	5.48-06	4.82-06	4.26-06	3.78-06	3.37-06	3.02-06	2.71-06
35	2.46-05	2.05-05	1.73-05	1.47-05	1.26-05	1.09-05	9.44-06	8.25-06	7.24-06	6.39-06	5.66-06	5.04-06	4.49-06	4.02-06
30	3.99-05	3.32-05	2.80-05	2.37-05	2.03-05	1.75-05	1.51-05	1.32-05	1.15-05	1.01-05	8.87-06	7.76-06	6.70-06	5.46-06
29	4.44-05	3.70-05	3.11-05	2.64-05	2.25-05	1.94-05	1.68-05	1.46-05	1.27-05	1.11-05	9.68-06	8.32-06	6.76-06	
28	4.96-05	4.13-05	3.47-05	2.94-05	2.51-05	2.16-05	1.87-05	1.62-05	1.41-05	1.22-05	1.04-05	8.44-06		
27	5.56-05	4.63-05	3.89-05	3.29-05	2.81-05	2.41-05	2.08-05	1.80-05	1.55-05	1.32-05	1.06-05			
26	6.27-05	5.21-05	4.37-05	3.70-05	3.15-05	2.70-05	2.32-05	1.99-05	1.68-05	1.35-05				
25	7.09-05	5.89-05	4.94-05	4.18-05	3.55-05	3.03-05	2.58-05	2.17-05	1.73-05					
24	8.08-05	6.70-05	5.61-05	4.73-05	4.00-05	3.39-05	2.84-05	2.25-05						
23	9.25-05	7.66-05	6.40-05	5.37-05	4.51-05	3.75-05	2.96-05							
22	1.06-04	8.80-05	7.32-05	6.10-05	5.04-05	3.94-05								
21	1.23-04	1.02-04	8.38-05	6.86-05	5.33-05									
20	1.44-04	1.17-04	9.52-05	7.33-05										
19	1.68-04	1.35-04	1.03-04											
18	1.94-04	1.47-04												
17	2.15-04													

HE + TE = 7.50+03 NE = 1.00+12 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.73-31	-4.51-38	-2.96-37	-8.33-37	-1.49-36	-6.18-37	6.14-36	2.18-35	4.47-35	7.31-35	1.07-34	1.46-34	1.93-34	2.48-34
45	3.74-31	-6.36-38	-4.15-37	-1.17-36	-2.12-36	-9.83-37	8.38-36	3.04-35	6.30-35	1.04-34	1.52-34	2.11-34	2.81-34	3.65-34
40	5.34-31	-9.41-38	-6.09-37	-1.74-36	-3.19-36	-1.68-36	1.18-35	4.43-35	9.30-35	1.55-34	2.31-34	3.23-34	4.36-34	5.76-34
35	8.00-31	-1.48-37	-9.50-37	-2.74-36	-5.14-36	-3.18-36	1.74-35	6.82-35	1.47-34	2.49-34	3.77-34	5.37-34	7.41-34	1.00-33
30	1.28-30	-2.55-37	-1.61-36	-4.72-36	-9.17-36	-6.85-36	2.68-35	1.14-34	2.53-34	4.42-34	6.90-34	1.02-33	1.46-33	2.05-33
29	1.41-30	-2.89-37	-1.82-36	-5.34-36	-1.05-35	-8.16-36	2.94-35	1.28-34	2.86-34	5.05-34	7.94-34	1.18-33	1.71-33	2.44-33
28	1.57-30	-3.28-37	-2.06-36	-6.08-36	-1.20-35	-9.79-36	3.22-35	1.44-34	3.26-34	5.80-34	9.22-34	1.39-33	2.03-33	2.93-33
27	1.76-30	-3.75-37	-2.35-36	-6.96-36	-1.39-35	-1.19-35	3.53-35	1.63-34	3.74-34	6.72-34	1.08-33	1.64-33	2.44-33	3.58-33
26	1.97-30	-4.32-37	-2.69-36	-8.03-36	-1.62-35	-1.45-35	3.88-35	1.86-34	4.32-34	7.86-34	1.28-33	1.98-33	2.98-33	4.46-33
25	2.22-30	-5.01-37	-3.11-36	-9.33-36	-1.91-35	-1.79-35	4.25-35	2.13-34	5.04-34	9.29-34	1.53-33	2.41-33	3.70-33	5.67-33
24	2.51-30	-5.86-37	-3.62-36	-1.09-35	-2.27-35	-2.25-35	4.64-35	2.45-34	5.93-34	1.11-33	1.87-33	2.99-33	4.70-33	7.41-33
23	2.86-30	-6.91-37	-4.25-36	-1.29-35	-2.72-35	-2.85-35	5.03-35	2.85-34	7.06-34	1.35-33	2.31-33	3.79-33	6.13-33	1.00-32
22	3.28-30	-8.23-37	-5.04-36	-1.55-35	-3.32-35	-3.67-35	5.39-35	3.35-34	8.50-34	1.66-33	2.92-33	4.92-33	8.25-33	1.41-32
21	3.78-30	-9.91-37	-6.04-36	-1.88-35	-4.09-35	-4.80-35	5.66-35	3.96-34	1.04-33	2.09-33	3.78-33	6.61-33	1.16-32	2.10-32
20	4.40-30	-1.21-36	-7.33-36	-2.30-35	-5.13-35	-6.40-35	5.74-35	4.74-34	1.29-33	2.69-33	5.06-33	9.26-33	1.72-32	3.38-32
19	5.15-30	-1.49-36	-9.03-36	-2.87-35	-6.56-35	-8.74-35	5.32-35	5.72-34	1.64-33	3.56-33	7.03-33	1.37-32	2.76-32	6.10-32
18	6.09-30	-1.87-36	-1.13-35	-3.66-35	-8.57-35	-1.22-34	3.94-35	6.98-34	2.14-33	4.90-33	1.03-32	2.17-32	4.94-32	1.31-31
17	7.27-30	-2.39-36	-1.44-35	-4.75-35	-1.15-34	-1.77-34	5.99-36	8.58-34	2.87-33	7.07-33	1.62-32	3.85-32	1.05-31	3.92-31
16	8.78-30	-3.12-36	-1.88-35	-6.32-35	-1.59-34	-2.64-34	-6.81-35	1.06-33	4.01-33	1.09-32	2.83-32	8.12-32	3.11-31	2.58-30
15	1.07-29	-4.16-36	-2.50-35	-8.65-35	-2.27-34	-4.12-34	-2.31-34	1.30-33	5.90-33	1.85-32	5.84-32	2.36-31	2.02-30	
14	1.33-29	-5.67-36	-3.43-35	-1.23-34	-3.38-34	-6.77-34	-5.98-34	1.50-33	9.30-33	3.66-32	1.64-31	1.49-30		
13	1.69-29	-7.93-36	-4.85-35	-1.80-34	-5.30-34	-1.19-33	-1.49-33	1.30-33	1.62-32	9.62-32	9.89-31			
12	2.18-29	-1.13-35	-7.08-35	-2.77-34	-8.82-34	-2.26-33	-3.88-33	-1.15-33	3.30-32	5.13-31				
11	2.89-29	-1.65-35	-1.06-34	-4.46-34	-1.58-33	-4.79-33	-1.16-32	-1.89-32	7.95-32					
10	3.95-29	-2.38-35	-1.63-34	-7.47-34	-3.06-33	-1.18-32	-4.54-32	-2.50-31						
9	5.63-29	-3.23-35	-2.44-34	-1.28-33	-6.53-33	-3.77-32	-3.60-31							
8	8.45-29	-3.70-35	-3.37-34	-2.18-33	-1.62-32	-2.24-31								
7	1.36-28	-3.02-35	-4.23-34	-3.96-33	-6.83-32									
6	2.45-28	-8.16-36	-5.87-34	-1.29-32										
5	5.24-28	6.48-35	-1.42-33											
4	1.57-27	6.63-34												
3	1.14-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.14-34	3.93-34	4.88-34	6.01-34	7.38-34	9.03-34	1.10-33	1.34-33	1.63-33	1.98-33	2.42-33	2.94-33	3.60-33	4.41-33
45	4.68-34	5.93-34	7.45-34	9.32-34	1.16-33	1.45-33	1.80-33	2.24-33	2.78-33	3.47-33	4.35-33	5.47-33	6.92-33	8.82-33
40	7.49-34	9.67-34	1.24-33	1.59-33	2.03-33	2.60-33	3.33-33	4.28-33	5.54-33	7.21-33	9.49-33	1.26-32	1.70-32	2.34-32
35	1.34-33	1.78-33	2.36-33	3.13-33	4.18-33	5.61-33	7.60-33	1.04-32	1.45-32	2.06-32	3.01-32	4.54-32	7.14-32	1.19-31
30	2.87-33	4.03-33	5.68-33	8.11-33	1.18-32	1.75-32	2.69-32	4.29-32	7.24-32	1.32-31	2.71-31	6.66-31	2.28-30	1.74-29
29	3.46-33	4.93-33	7.10-33	1.04-32	1.55-32	2.39-32	3.83-32	6.48-32	1.19-31	2.44-31	6.01-31	2.07-30	1.58-29	
28	4.23-33	6.15-33	9.06-33	1.36-32	2.11-32	3.40-32	5.78-32	1.06-31	2.19-31	5.40-31	1.86-30	1.43-29		
27	5.27-33	7.84-33	1.19-32	1.85-32	2.99-32	5.12-32	9.45-32	1.95-31	4.84-31	1.67-30	1.28-29			
26	6.72-33	1.03-32	1.61-32	2.62-32	4.51-32	8.36-32	1.73-31	4.31-31	1.49-30	1.15-29				
25	8.79-33	1.39-32	2.28-32	3.95-32	7.34-32	1.53-31	3.82-31	1.33-30	1.02-29					
24	1.19-32	1.97-32	3.43-32	6.42-32	1.34-31	3.37-31	1.18-30	9.09-30						
23	1.68-32	2.95-32	5.57-32	1.17-31	2.95-31	1.03-30	8.04-30							
22	2.51-32	4.78-32	1.01-31	2.57-31	9.03-31	7.04-30								
21	4.05-32	8.68-32	2.21-31	7.84-31	6.15-30									
20	7.34-32	1.89-31	6.74-31	5.32-30										
19	1.59-31	5.73-31	4.55-30											
18	4.79-31	3.84-30												
17	3.19-30													

HE + TE = 7.50+03 NE = 1.00+13 CASE B NC = 20

TOTAL RC = 1.053-11 4-3 RC = 1.699-12 4-3 EM = 7.200-24 2S RC = 2.244-12 2P RC = 8.288-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.76-03	5.40-04	2.32-04	1.20-04	7.02-05	4.45-05	2.99-05	2.11-05	1.54-05	1.16-05	8.96-06	7.06-06	5.66-06	4.60-06
45	2.44-03	7.47-04	3.21-04	1.66-04	9.70-05	6.14-05	4.13-05	2.91-05	2.13-05	1.60-05	1.24-05	9.75-06	7.81-06	6.36-06
40	3.51-03	1.08-03	4.62-04	2.39-04	1.40-04	8.84-05	5.95-05	4.19-05	3.06-05	2.31-05	1.78-05	1.40-05	1.12-05	9.14-06
35	5.32-03	1.63-03	7.01-04	3.63-04	2.12-04	1.34-04	9.01-05	6.35-05	4.64-05	3.49-05	2.69-05	2.12-05	1.70-05	1.38-05
30	8.65-03	2.65-03	1.14-03	5.90-04	3.44-04	2.18-04	1.47-04	1.03-04	7.54-05	5.67-05	4.37-05	3.44-05	2.75-05	2.24-05
29	9.64-03	2.96-03	1.27-03	6.58-04	3.83-04	2.43-04	1.63-04	1.15-04	8.39-05	6.31-05	4.87-05	3.83-05	3.07-05	2.49-05
28	1.08-02	3.31-03	1.42-03	7.36-04	4.29-04	2.71-04	1.83-04	1.29-04	9.39-05	7.06-05	5.44-05	4.28-05	3.43-05	2.78-05
27	1.21-02	3.72-03	1.60-03	8.27-04	4.82-04	3.05-04	2.05-04	1.44-04	1.05-04	7.93-05	6.11-05	4.81-05	3.85-05	3.12-05
26	1.37-02	4.20-03	1.80-03	9.34-04	5.45-04	3.45-04	2.32-04	1.63-04	1.19-04	8.95-05	6.90-05	5.42-05	4.34-05	3.52-05
25	1.56-02	4.77-03	2.05-03	1.06-03	6.18-04	3.91-04	2.63-04	1.85-04	1.35-04	1.02-04	7.83-05	6.15-05	4.92-05	3.99-05
24	1.78-02	5.46-03	2.34-03	1.21-03	7.07-04	4.47-04	3.00-04	2.11-04	1.54-04	1.16-04	8.93-05	7.02-05	5.61-05	4.55-05
23	2.05-02	6.28-03	2.70-03	1.40-03	8.13-04	5.14-04	3.46-04	2.43-04	1.77-04	1.33-04	1.03-04	8.06-05	6.44-05	5.22-05
22	2.37-02	7.28-03	3.13-03	1.62-03	9.42-04	5.96-04	4.00-04	2.82-04	2.05-04	1.54-04	1.19-04	9.31-05	7.43-05	6.02-05
21	2.78-02	8.51-03	3.65-03	1.89-03	1.10-03	6.96-04	4.67-04	3.29-04	2.40-04	1.80-04	1.38-04	1.08-04	8.65-05	6.99-05
20	3.28-02	1.00-02	4.31-03	2.23-03	1.30-03	8.20-04	5.51-04	3.87-04	2.82-04	2.12-04	1.63-04	1.27-04	1.01-04	8.18-05
19	3.90-02	1.20-02	5.13-03	2.65-03	1.55-03	9.77-04	6.56-04	4.61-04	3.35-04	2.52-04	1.93-04	1.51-04	1.20-04	9.63-05
18	4.71-02	1.44-02	6.19-03	3.20-03	1.86-03	1.16-03	7.90-04	5.54-04	4.04-04	3.02-04	2.32-04	1.81-04	1.43-04	1.14-04
17	5.76-02	1.77-02	7.57-03	3.91-03	2.28-03	1.44-03	9.64-04	6.76-04	4.92-04	3.68-04	2.81-04	2.18-04	1.71-04	1.34-04
16	7.17-02	2.19-02	9.41-03	4.86-03	2.83-03	1.78-03	1.19-03	8.37-04	6.08-04	4.53-04	3.45-04	2.66-04	2.05-04	1.51-04
15	9.07-02	2.78-02	1.19-02	6.15-03	3.57-03	2.25-03	1.51-03	1.05-03	7.63-04	5.67-04	4.29-04	3.25-04	2.36-04	
14	1.17-01	3.59-02	1.54-02	7.94-03	4.61-03	2.90-03	1.94-03	1.35-03	9.77-04	7.20-04	5.35-04	3.82-04		
13	1.56-01	4.77-02	2.04-02	1.05-02	6.11-03	3.84-03	2.56-03	1.78-03	1.27-03	9.23-04	6.45-04			
12	2.14-01	6.53-02	2.79-02	1.44-02	8.33-03	5.23-03	3.47-03	2.39-03	1.68-03	1.15-03				
11	3.04-01	9.28-02	3.96-02	2.04-02	1.18-02	7.36-03	4.85-03	3.29-03	2.17-03					
10	4.50-01	1.37-01	5.86-02	3.00-02	1.73-02	1.07-02	6.93-03	4.42-03						
9	6.95-01	2.12-01	9.01-02	4.60-02	2.63-02	1.60-02	9.75-03							
8	1.10+00	3.35-01	1.42-01	7.19-02	4.03-02	2.31-02								
7	1.68+00	5.09-01	2.14-01	1.07-01	5.63-02									
6	2.17+00	6.53-01	2.70-01	1.27-01										
5	2.49+00	7.35-01	2.86-01											
4	3.60+00	1.00+00												
3	8.22+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.80-06	3.17-06	2.67-06	2.27-06	1.95-06	1.68-06	1.46-06	1.28-06	1.13-06	9.97-07	8.87-07	7.91-07	7.09-07	6.38-07
45	5.24-06	4.37-06	3.69-06	3.13-06	2.69-06	2.32-06	2.02-06	1.77-06	1.55-06	1.37-06	1.22-06	1.09-06	9.76-07	8.78-07
40	7.53-06	6.28-06	5.29-06	4.50-06	3.86-06	3.33-06	2.90-06	2.52-06	2.23-06	1.97-06	1.75-06	1.56-06	1.39-06	1.25-06
35	1.14-05	9.49-06	8.00-06	6.79-06	5.82-06	5.02-06	4.36-06	3.81-06	3.35-06	2.95-06	2.62-06	2.33-06	2.08-06	1.86-06
30	1.84-05	1.54-05	1.29-05	1.10-05	9.38-06	8.08-06	7.00-06	6.09-06	5.33-06	4.67-06	4.10-06	3.59-06	3.10-06	2.52-06
29	2.05-05	1.71-05	1.44-05	1.22-05	1.04-05	8.96-06	7.76-06	6.74-06	5.88-06	5.14-06	4.47-06	3.85-06	3.12-06	
28	2.29-05	1.91-05	1.60-05	1.36-05	1.16-05	9.98-06	8.62-06	7.48-06	6.50-06	5.63-06	4.82-06	3.90-06		
27	2.57-05	2.14-05	1.80-05	1.52-05	1.30-05	1.11-05	9.61-06	8.30-06	7.16-06	6.10-06	4.91-06			
26	2.90-05	2.41-05	2.02-05	1.71-05	1.46-05	1.25-05	1.07-05	9.19-06	7.79-06	6.24-06				
25	3.28-05	2.73-05	2.29-05	1.93-05	1.64-05	1.40-05	1.19-05	1.01-05	8.02-06					
24	3.74-05	3.10-05	2.60-05	2.19-05	1.85-05	1.57-05	1.31-05	1.04-05						
23	4.28-05	3.55-05	2.96-05	2.49-05	2.09-05	1.74-05	1.37-05							
22	4.93-05	4.07-05	3.39-05	2.82-05	2.33-05	1.83-05								
21	5.71-05	4.70-05	3.88-05	3.18-05	2.47-05									
20	6.66-05	5.44-05	4.41-05	3.40-05										
19	7.78-05	6.25-05	4.77-05											
18	9.04-05	6.83-05												
17	1.00-04													

HE + TE = 7.50+03 NE = 1.00+13 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.41-31	2.90-38	7.24-38	9.06-37	5.84-36	1.82-35	3.49-35	5.40-35	7.57-35	1.01-34	1.32-34	1.69-34	2.14-34	2.68-34
45	7.43-31	3.83-38	9.31-38	1.23-36	8.07-36	2.53-35	4.89-35	7.59-35	1.07-34	1.44-34	1.89-34	2.44-34	3.12-34	3.95-34
40	1.06-30	5.17-38	1.20-37	1.74-36	1.16-35	3.68-35	7.15-35	1.12-34	1.59-34	2.17-34	2.88-34	3.76-34	4.86-34	6.23-34
35	1.59-30	7.07-38	1.51-37	2.54-36	1.75-35	5.64-35	1.11-34	1.76-34	2.54-34	3.51-34	4.72-34	6.29-34	8.30-34	1.09-33
30	2.53-30	9.60-38	1.67-37	3.91-36	2.84-35	9.36-35	1.88-34	3.03-34	4.47-34	6.32-34	8.75-34	1.20-33	1.64-33	2.24-33
29	2.80-30	1.01-37	1.63-37	4.29-36	3.16-35	1.05-34	2.11-34	3.43-34	5.09-34	7.24-34	1.01-33	1.40-33	1.93-33	2.67-33
28	3.12-30	1.06-37	1.54-37	4.72-36	3.53-35	1.18-34	2.39-34	3.90-34	5.83-34	8.35-34	1.18-33	1.64-33	2.30-33	3.22-33
27	3.48-30	1.11-37	1.36-37	5.19-36	3.97-35	1.33-34	2.72-34	4.48-34	6.73-34	9.73-34	1.38-33	1.96-33	2.77-33	3.94-33
26	3.91-30	1.14-37	1.08-37	5.73-36	4.47-35	1.52-34	3.12-34	5.17-34	7.84-34	1.14-33	1.64-33	2.36-33	3.39-33	4.92-33
25	4.40-30	1.16-37	6.33-38	6.33-36	5.07-35	1.74-34	3.60-34	6.02-34	9.22-34	1.36-33	1.98-33	2.89-33	4.23-33	6.28-33
24	4.99-30	1.15-37	-4.26-39	7.01-36	5.78-35	2.01-34	4.19-34	7.08-34	1.10-33	1.64-33	2.43-33	3.60-33	5.39-33	8.23-33
23	5.68-30	1.09-37	-1.05-37	7.75-36	6.63-35	2.33-34	4.93-34	8.42-34	1.32-33	2.01-33	3.02-33	4.58-33	7.06-33	1.12-32
22	6.51-30	9.59-38	-2.56-37	8.58-36	7.66-35	2.74-34	5.86-34	1.01-33	1.61-33	2.50-33	3.85-33	6.00-33	9.57-33	1.58-32
21	7.51-30	7.13-38	-4.79-37	9.46-36	8.91-35	3.24-34	7.05-34	1.24-33	2.01-33	3.18-33	5.04-33	8.12-33	1.35-32	2.37-32
20	8.72-30	2.95-38	-8.10-37	1.04-35	1.05-34	3.89-34	8.60-34	1.54-33	2.56-33	4.16-33	6.81-33	1.15-32	2.03-32	3.85-32
19	1.02-29	-4.05-38	-1.31-36	1.13-35	1.24-34	4.73-34	1.07-33	1.96-33	3.34-33	5.62-33	9.62-33	1.72-32	3.28-32	7.00-32
18	1.21-29	-1.55-37	-2.07-36	1.20-35	1.48-34	5.83-34	1.35-33	2.55-33	4.50-33	7.91-33	1.44-32	2.78-32	5.96-32	1.53-31
17	1.44-29	-3.42-37	-3.25-36	1.22-35	1.79-34	7.34-34	1.75-33	3.43-33	6.33-33	1.18-32	2.32-32	5.03-32	1.30-31	4.64-31
16	1.74-29	-6.48-37	-5.13-36	1.14-35	2.18-34	9.43-34	2.35-33	4.80-33	9.39-33	1.89-32	4.18-32	1.09-31	3.93-31	3.13-30
15	2.13-29	-1.16-36	-8.18-36	8.26-36	2.70-34	1.25-33	3.26-33	7.09-33	1.50-32	3.41-32	9.04-32	3.29-31	2.64-30	
14	2.65-29	-2.02-36	-1.33-35	3.72-37	3.37-34	1.70-33	4.78-33	1.13-32	2.69-32	7.33-32	2.71-31	2.20-30		
13	3.35-29	-3.52-36	-2.23-35	-1.80-35	4.21-34	2.42-33	7.49-33	2.00-32	5.73-32	2.18-31	1.80-30			
12	4.33-29	-6.24-36	-3.88-35	-6.02-35	5.20-34	3.65-33	1.30-32	4.19-32	1.68-31	1.43-30				
11	5.73-29	-1.14-35	-7.10-35	-1.61-34	5.91-34	5.91-33	2.63-32	1.20-31	1.08-30					
10	7.84-29	-2.15-35	-1.38-34	-4.16-34	4.31-34	1.06-32	7.09-32	7.38-31						
9	1.12-28	-4.22-35	-2.90-34	-1.13-33	-1.04-33	2.22-32	3.88-31							
8	1.68-28	-8.49-35	-6.56-34	-3.46-33	-1.13-32	5.05-32								
7	2.70-28	-1.63-34	-1.55-33	-1.27-32	-1.34-31									
6	4.86-28	-2.40-34	-3.56-33	-7.27-32										
5	1.04-27	-2.11-34	-1.05-32											
4	3.11-27	4.20-34												
3	2.25-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.33-34	4.11-34	5.05-34	6.19-34	7.55-34	9.20-34	1.12-33	1.36-33	1.65-33	2.00-33	2.43-33	2.97-33	3.62-33	4.43-33
45	4.96-34	6.20-34	7.72-34	9.60-34	1.19-33	1.48-33	1.83-33	2.27-33	2.82-33	3.51-33	4.39-33	5.51-33	6.97-33	8.88-33
40	7.96-34	1.01-33	1.29-33	1.64-33	2.08-33	2.65-33	3.38-33	4.34-33	5.61-33	7.29-33	9.58-33	1.27-32	1.72-32	2.36-32
35	1.43-33	1.87-33	2.46-33	3.24-33	4.30-33	5.74-33	7.75-33	1.06-32	1.47-32	2.09-32	3.04-32	4.59-32	7.21-32	1.20-31
30	3.08-33	4.26-33	5.94-33	8.42-33	1.22-32	1.80-32	2.75-32	4.38-32	7.37-32	1.34-31	2.75-31	6.75-31	2.31-30	1.76-29
29	3.71-33	5.22-33	7.43-33	1.08-32	1.60-32	2.45-32	3.92-32	6.62-32	1.21-31	2.48-31	6.10-31	2.09-30	1.60-29	
28	4.55-33	6.52-33	9.50-33	1.42-32	2.18-32	3.50-32	5.92-32	1.09-31	2.23-31	5.50-31	1.89-30	1.45-29		
27	5.68-33	8.33-33	1.25-32	1.93-32	3.10-32	5.28-32	9.70-32	2.00-31	4.94-31	1.70-30	1.30-29			
26	7.26-33	1.09-32	1.70-32	2.74-32	4.68-32	8.63-32	1.78-31	4.42-31	1.53-30	1.17-29				
25	9.52-33	1.49-32	2.41-32	4.13-32	7.64-32	1.58-31	3.94-31	1.05-29						
24	1.29-32	2.11-32	3.63-32	6.74-32	1.40-31	3.50-31	1.21-30	9.37-30						
23	1.83-32	3.17-32	5.91-32	1.23-31	3.09-31	1.08-30	8.31-30							
22	2.75-32	5.16-32	1.08-31	2.71-31	9.48-31	7.36-30								
21	4.47-32	9.41-32	2.37-31	8.32-31	6.48-30									
20	8.15-32	2.06-31	7.26-31	5.68-30										
19	1.78-31	6.30-31	4.94-30											
18	5.43-31	4.28-30												
17	3.67-30													

HE + TE = 1.00+04 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 1.530-12 4-3 RC = 3.555-13 4-3 EM = 1.506-24 2S RC = 4.091-13 2P RC = 1.121-12

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.02-04	3.48-04	1.88-04	1.17-04	7.90-05	5.62-05	4.16-05	3.16-05	2.47-05	1.96-05	1.58-05	1.30-05	1.08-05	9.02-06
45	1.20-03	4.67-04	2.54-04	1.59-04	1.08-04	7.68-05	5.69-05	4.34-05	3.39-05	2.70-05	2.18-05	1.79-05	1.49-05	1.25-05
40	1.68-03	6.55-04	3.57-04	2.24-04	1.52-04	1.09-04	8.09-05	6.18-05	4.83-05	3.85-05	3.12-05	2.56-05	2.13-05	1.79-05
35	2.47-03	9.67-04	5.29-04	3.33-04	2.27-04	1.62-04	1.21-04	9.25-05	7.24-05	5.78-05	4.68-05	3.85-05	3.20-05	2.69-05
30	3.88-03	1.52-03	8.33-04	5.26-04	3.59-04	2.58-04	1.92-04	1.47-04	1.16-04	9.24-05	7.50-05	6.17-05	5.13-05	4.31-05
29	4.28-03	1.68-03	9.21-04	5.82-04	3.97-04	2.86-04	2.13-04	1.63-04	1.28-04	1.02-04	8.32-05	6.84-05	5.69-05	4.78-05
28	4.74-03	1.86-03	1.02-03	6.46-04	4.42-04	3.18-04	2.37-04	1.82-04	1.43-04	1.14-04	9.26-05	7.62-05	6.34-05	5.33-05
27	5.28-03	2.07-03	1.14-03	7.20-04	4.92-04	3.54-04	2.65-04	2.03-04	1.59-04	1.28-04	1.04-04	8.53-05	7.10-05	5.97-05
26	5.89-03	2.31-03	1.27-03	8.06-04	5.52-04	3.97-04	2.97-04	2.28-04	1.79-04	1.43-04	1.16-04	9.59-05	7.98-05	6.71-05
25	6.61-03	2.60-03	1.43-03	9.06-04	6.21-04	4.47-04	3.34-04	2.57-04	2.02-04	1.62-04	1.31-04	1.08-04	9.02-05	7.58-05
24	7.44-03	2.93-03	1.61-03	1.02-03	7.02-04	5.06-04	3.79-04	2.91-04	2.29-04	1.84-04	1.49-04	1.23-04	1.02-04	8.60-05
23	8.43-03	3.32-03	1.83-03	1.16-03	7.98-04	5.76-04	4.31-04	3.32-04	2.61-04	2.09-04	1.70-04	1.40-04	1.17-04	9.82-05
22	9.60-03	3.78-03	2.09-03	1.33-03	9.13-04	6.60-04	4.94-04	3.81-04	3.00-04	2.41-04	1.96-04	1.61-04	1.34-04	1.13-04
21	1.10-02	4.34-03	2.40-03	1.53-03	1.05-03	7.61-04	5.71-04	4.40-04	3.47-04	2.78-04	2.27-04	1.87-04	1.56-04	1.30-04
20	1.27-02	5.01-03	2.78-03	1.77-03	1.22-03	8.84-04	6.64-04	5.12-04	4.04-04	3.25-04	2.65-04	2.18-04	1.81-04	1.52-04
19	1.47-02	5.83-03	3.24-03	2.07-03	1.43-03	1.03-03	7.78-04	6.02-04	4.75-04	3.82-04	3.11-04	2.57-04	2.13-04	1.77-04
18	1.73-02	6.84-03	3.80-03	2.43-03	1.68-03	1.22-03	9.22-04	7.14-04	5.64-04	4.54-04	3.70-04	3.04-04	2.52-04	2.08-04
17	2.04-02	8.09-03	4.51-03	2.90-03	2.01-03	1.46-03	1.10-03	8.56-04	6.77-04	5.45-04	4.44-04	3.64-04	2.99-04	2.40-04
16	2.44-02	9.69-03	5.42-03	3.49-03	2.42-03	1.77-03	1.34-03	1.04-03	8.24-04	6.63-04	5.39-04	4.39-04	3.52-04	2.59-04
15	2.94-02	1.17-02	6.58-03	4.25-03	2.96-03	2.17-03	1.65-03	1.28-03	1.02-03	8.17-04	6.61-04	5.26-04	3.87-04	
14	3.60-02	1.44-02	8.12-03	5.26-03	3.68-03	2.71-03	2.06-03	1.61-03	1.27-03	1.02-03	8.09-04	5.93-04		
13	4.48-02	1.80-02	1.02-02	6.63-03	4.66-03	3.44-03	2.63-03	2.05-03	1.63-03	1.28-03	9.37-04			
12	5.68-02	2.29-02	1.30-02	8.54-03	6.04-03	4.48-03	3.43-03	2.68-03	2.10-03	1.53-03				
11	7.35-02	2.98-02	1.71-02	1.13-02	8.04-03	6.00-03	4.61-03	3.58-03	2.61-03					
10	9.76-02	3.99-02	2.31-02	1.54-02	1.11-02	8.33-03	6.38-03	4.65-03						
9	1.34-01	5.53-02	3.25-02	2.20-02	1.60-02	1.21-02	8.78-03							
8	1.92-01	8.03-02	4.80-02	3.31-02	2.44-02	1.77-02								
7	2.91-01	1.24-01	7.63-02	5.38-02	3.90-02									
6	4.76-01	2.10-01	1.34-01	9.59-02										
5	8.78-01	4.07-01	2.75-01											
4	1.97+00	1.00+00												
3	6.49+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.64-06	6.52-06	5.60-06	4.85-06	4.22-06	3.70-06	3.26-06	2.88-06	2.56-06	2.28-06	2.04-06	1.83-06	1.65-06	1.49-06
45	1.06-05	9.01-06	7.75-06	6.71-06	5.84-06	5.12-06	4.50-06	3.98-06	3.53-06	3.15-06	2.82-06	2.53-06	2.27-06	2.05-06
40	1.51-05	1.29-05	1.11-05	9.62-06	8.38-06	7.34-06	6.45-06	5.70-06	5.06-06	4.50-06	4.02-06	3.60-06	3.23-06	2.90-06
35	2.28-05	1.94-05	1.67-05	1.45-05	1.26-05	1.10-05	9.68-06	8.54-06	7.56-06	6.70-06	5.96-06	5.31-06	4.73-06	4.21-06
30	3.65-05	3.12-05	2.68-05	2.32-05	2.02-05	1.76-05	1.54-05	1.35-05	1.18-05	1.04-05	9.03-06	7.79-06	6.56-06	5.11-06
29	4.06-05	3.46-05	2.98-05	2.57-05	2.23-05	1.95-05	1.70-05	1.48-05	1.30-05	1.13-05	9.70-06	8.14-06	6.32-06	
28	4.52-05	3.86-05	3.32-05	2.86-05	2.48-05	2.16-05	1.88-05	1.64-05	1.42-05	1.22-05	1.02-05	7.86-06		
27	5.06-05	4.32-05	3.71-05	3.20-05	2.77-05	2.40-05	2.08-05	1.80-05	1.54-05	1.28-05	9.87-06			
26	5.68-05	4.85-05	4.16-05	3.58-05	3.09-05	2.67-05	2.30-05	1.96-05	1.63-05	1.25-05				
25	6.42-05	5.47-05	4.69-05	4.03-05	3.46-05	2.97-05	2.52-05	2.09-05	1.60-05					
24	7.28-05	6.20-05	5.30-05	4.54-05	3.88-05	3.28-05	2.71-05	2.06-05						
23	8.31-05	7.06-05	6.02-05	5.12-05	4.32-05	3.55-05	2.69-05							
22	9.53-05	8.08-05	6.84-05	5.74-05	4.71-05	3.55-05								
21	1.10-04	9.26-05	7.74-05	6.33-05	4.75-05									
20	1.27-04	1.06-04	8.62-05	6.44-05										
19	1.47-04	1.19-04	8.87-05											
18	1.68-04	1.24-04												
17	1.78-04													

HE + TE = 1.00+04 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	2.37-38	3.79-38	8.02-38	1.63-37	3.04-37	5.22-37	8.38-37	1.27-36	1.86-36	2.61-36	3.57-36	4.75-36	6.19-36
45	0.00+00	3.26-38	5.33-38	1.15-37	2.39-37	4.50-37	7.77-37	1.25-36	1.90-36	2.75-36	3.83-36	5.15-36	6.71-36	8.50-36
40	0.00+00	4.66-38	7.75-38	1.71-37	3.60-37	6.86-37	1.20-36	1.94-36	2.97-36	4.31-36	6.02-36	8.08-36	1.05-35	1.31-35
35	0.00+00	7.02-38	1.19-37	2.67-37	5.70-37	1.10-36	1.95-36	3.21-36	4.98-36	7.33-36	1.03-35	1.40-35	1.83-35	2.30-35
30	0.00+00	1.13-37	1.95-37	4.48-37	9.77-37	1.93-36	3.49-36	5.86-36	9.29-36	1.40-35	2.02-35	2.80-35	3.72-35	4.70-35
29	0.00+00	1.26-37	2.18-37	5.02-37	1.10-36	2.19-36	3.97-36	6.72-36	1.07-35	1.62-35	2.36-35	3.29-35	4.39-35	5.55-35
28	0.00+00	1.40-37	2.44-37	5.66-37	1.25-36	2.49-36	4.55-36	7.75-36	1.24-35	1.90-35	2.78-35	3.90-35	5.23-35	6.62-35
27	0.00+00	1.57-37	2.75-37	6.41-37	1.42-36	2.86-36	5.26-36	9.00-36	1.46-35	2.24-35	3.30-35	4.67-35	6.30-35	7.96-35
26	0.00+00	1.77-37	3.11-37	7.31-37	1.63-36	3.30-36	6.11-36	1.05-35	1.72-35	2.67-35	3.97-35	5.66-35	7.67-35	9.67-35
25	0.00+00	2.00-37	3.54-37	8.37-37	1.88-36	3.84-36	7.16-36	1.25-35	2.05-35	3.22-35	4.84-35	6.95-35	9.47-35	1.18-34
24	0.00+00	2.27-37	4.05-37	9.66-37	2.19-36	4.50-36	8.47-36	1.49-35	2.48-35	3.93-35	5.97-35	8.67-35	1.19-34	1.46-34
23	0.00+00	2.60-37	4.67-37	1.12-36	2.57-36	5.32-36	1.01-35	1.80-35	3.03-35	4.87-35	7.50-35	1.10-34	1.51-34	1.79-34
22	0.00+00	2.99-37	5.42-37	1.32-36	3.04-36	6.36-36	1.23-35	2.21-35	3.77-35	6.15-35	9.60-35	1.42-34	1.94-34	2.15-34
21	0.00+00	3.47-37	6.34-37	1.56-36	3.63-36	7.70-36	1.50-35	2.75-35	4.77-35	7.92-35	1.26-34	1.88-34	2.52-34	2.36-34
20	0.00+00	4.05-37	7.49-37	1.86-36	4.39-36	9.45-36	1.87-35	3.49-35	6.17-35	1.05-34	1.69-34	2.55-34	3.25-34	1.60-34
19	0.00+00	4.77-37	8.93-37	2.25-36	5.39-36	1.18-35	2.38-35	4.52-35	8.19-35	1.42-34	2.35-34	3.53-34	3.87-34	-3.75-34
18	0.00+00	5.68-37	1.08-36	2.75-36	6.72-36	1.50-35	3.09-35	6.03-35	1.12-34	2.01-34	3.38-34	4.92-34	2.70-34	-3.42-33
17	0.00+00	6.83-37	1.32-36	3.43-36	8.53-36	1.95-35	4.13-35	8.31-35	1.60-34	2.97-34	5.07-34	6.31-34	-1.16-33	-2.64-32
16	0.00+00	8.33-37	1.63-36	4.34-36	1.11-35	2.60-35	5.71-35	1.19-34	2.41-34	4.64-34	7.79-34	2.79-34	-1.46-32	-4.45-31
15	0.00+00	1.03-36	2.06-36	5.63-36	1.48-35	3.60-35	8.25-35	1.81-34	3.87-34	7.76-34	1.06-33	-6.44-33	-2.94-31	
14	0.00+00	1.30-36	2.66-36	7.50-36	2.05-35	5.21-35	1.26-34	2.97-34	6.81-34	1.37-33	-1.19-33	-1.78-31		
13	0.00+00	1.66-36	3.52-36	1.03-35	2.96-35	7.99-35	2.09-34	5.39-34	1.35-33	1.75-33	-9.42-32			
12	0.00+00	2.19-36	4.81-36	1.48-35	4.53-35	1.33-34	3.86-34	1.14-33	2.98-33	-3.85-32				
11	0.00+00	2.97-36	6.85-36	2.26-35	7.53-35	2.49-34	8.52-34	3.08-33	-5.65-33					
10	0.00+00	4.17-36	1.03-35	3.73-35	1.41-34	5.61-34	2.54-33	9.97-33						
9	0.00+00	6.17-36	1.66-35	6.91-35	3.20-34	1.77-33	1.42-32							
8	0.00+00	9.76-36	3.00-35	1.55-34	1.03-33	1.20-32								
7	0.00+00	1.70-35	6.47-35	4.96-34	7.69-33									
6	0.00+00	3.48-35	1.95-34	3.74-33										
5	0.00+00	9.48-35	1.35-33											
4	0.00+00	5.26-34												
3	0.00+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.90-36	9.90-36	1.22-35	1.48-35	1.76-35	2.06-35	2.35-35	2.63-35	2.85-35	2.95-35	2.86-35	2.46-35	1.56-35	-7.39-37
45	1.05-35	1.25-35	1.44-35	1.60-35	1.67-35	1.60-35	1.28-35	5.53-36	-7.97-36	-3.11-35	-6.88-35	-1.29-34	-2.22-34	-3.67-34
40	1.58-35	1.82-35	1.97-35	1.93-35	1.55-35	9.70-36	-1.40-35	-5.00-35	-1.12-34	-2.18-34	-3.93-34	-6.82-34	-1.16-33	-1.97-33
35	2.74-35	3.05-35	3.03-35	2.32-35	2.78-36	-4.21-35	-1.32-34	-3.02-34	-6.20-34	-1.21-33	-2.33-33	-4.50-33	-8.85-33	-1.81-32
30	5.52-35	5.72-35	4.27-35	-9.57-36	-1.45-34	-4.61-34	-1.18-33	-2.82-33	-6.72-33	-1.67-32	-4.53-32	-1.45-31	-6.40-31	-6.20-30
29	6.48-35	6.48-35	4.01-35	-4.33-35	-2.61-34	-7.90-34	-2.05-33	-5.17-33	-1.34-32	-3.75-32	-1.24-31	-5.61-31	-5.59-30	
28	7.63-35	7.23-35	2.95-35	-1.09-34	-4.80-34	-1.42-33	-3.85-33	-1.04-32	-3.09-32	-1.04-31	-4.86-31	-5.01-30		
27	9.02-35	7.80-35	1.85-36	-2.41-34	-9.14-34	-2.75-33	-7.95-33	-2.43-32	-8.61-32	-4.17-31	-4.45-30			
26	1.06-34	7.73-35	-6.41-35	-5.18-34	-1.85-33	-5.84-33	-1.89-32	-7.01-32	-3.53-31	-3.92-30				
25	1.23-34	5.88-35	-2.20-34	-1.14-33	-4.11-33	-1.43-32	-5.59-32	-2.95-31	-3.43-30					
24	1.37-34	-7.37-36	-6.02-34	-2.71-33	-1.04-32	-4.36-32	-2.42-31	-2.96-30						
23	1.33-34	-2.06-34	-1.62-33	-7.29-33	-3.30-32	-1.95-31	-2.52-30							
22	6.57-35	-8.07-34	-4.76-33	-2.42-32	-1.54-31	-2.12-30								
21	-2.25-34	-2.82-33	-1.69-32	-1.18-31	-1.75-30									
20	-1.38-33	-1.11-32	-8.77-32	-1.42-30										
19	-6.69-33	-6.25-32	-1.12-30											
18	-4.21-32	-8.57-31												
17	-6.33-31													

HE + TE = 1.00+04 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 1.533-12 4-3 RC = 3.549-13 4-3 EM = 1.504-24 2S RC = 4.101-13 2P RC = 1.123-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.16-03	4.26-04	2.17-04	1.29-04	8.42-05	5.83-05	4.22-05	3.16-05	2.43-05	1.91-05	1.53-05	1.25-05	1.03-05	8.58-06
45	1.40-03	5.27-04	2.77-04	1.69-04	1.12-04	7.85-05	5.74-05	4.33-05	3.36-05	2.65-05	2.13-05	1.74-05	1.44-05	1.21-05
40	1.82-03	6.97-04	3.74-04	2.32-04	1.56-04	1.10-04	8.13-05	6.18-05	4.81-05	3.82-05	3.08-05	2.52-05	2.09-05	1.75-05
35	2.57-03	9.95-04	5.40-04	3.38-04	2.29-04	1.63-04	1.21-04	9.24-05	7.22-05	5.74-05	4.65-05	3.81-05	3.16-05	2.65-05
30	3.94-03	1.54-03	8.42-04	5.30-04	3.61-04	2.59-04	1.93-04	1.47-04	1.15-04	9.20-05	7.45-05	6.12-05	5.09-05	4.27-05
29	4.34-03	1.70-03	9.30-04	5.86-04	3.99-04	2.87-04	2.13-04	1.63-04	1.28-04	1.02-04	8.27-05	6.80-05	5.65-05	4.74-05
28	4.80-03	1.88-03	1.03-03	6.50-04	4.44-04	3.18-04	2.37-04	1.82-04	1.42-04	1.14-04	9.22-05	7.57-05	6.29-05	5.28-05
27	5.33-03	2.09-03	1.15-03	7.24-04	4.95-04	3.55-04	2.65-04	2.03-04	1.59-04	1.27-04	1.03-04	8.47-05	7.04-05	5.91-05
26	5.95-03	2.33-03	1.28-03	8.10-04	5.54-04	3.98-04	2.97-04	2.28-04	1.79-04	1.43-04	1.16-04	9.52-05	7.92-05	6.65-05
25	6.66-03	2.62-03	1.44-03	9.11-04	6.23-04	4.48-04	3.35-04	2.57-04	2.02-04	1.61-04	1.31-04	1.08-04	8.94-05	7.51-05
24	7.50-03	2.95-03	1.62-03	1.03-03	7.04-04	5.07-04	3.79-04	2.91-04	2.29-04	1.83-04	1.48-04	1.22-04	1.02-04	8.52-05
23	8.49-03	3.34-03	1.84-03	1.17-03	8.01-04	5.77-04	4.32-04	3.32-04	2.61-04	2.09-04	1.70-04	1.39-04	1.16-04	9.73-05
22	9.66-03	3.80-03	2.10-03	1.33-03	9.16-04	6.61-04	4.95-04	3.81-04	2.99-04	2.40-04	1.95-04	1.60-04	1.33-04	1.12-04
21	1.11-02	4.36-03	2.41-03	1.53-03	1.05-03	7.62-04	5.71-04	4.40-04	3.46-04	2.77-04	2.25-04	1.85-04	1.54-04	1.29-04
20	1.28-02	5.03-03	2.79-03	1.78-03	1.22-03	8.85-04	6.64-04	5.12-04	4.03-04	3.23-04	2.63-04	2.16-04	1.80-04	1.50-04
19	1.48-02	5.86-03	3.25-03	2.07-03	1.43-03	1.04-03	7.78-04	6.01-04	4.74-04	3.80-04	3.09-04	2.54-04	2.11-04	1.75-04
18	1.73-02	6.87-03	3.82-03	2.44-03	1.69-03	1.22-03	9.22-04	7.12-04	5.62-04	4.51-04	3.67-04	3.02-04	2.49-04	2.05-04
17	2.05-02	8.13-03	4.53-03	2.91-03	2.01-03	1.46-03	1.10-03	8.54-04	6.75-04	5.42-04	4.41-04	3.61-04	2.96-04	2.39-04
16	2.45-02	9.73-03	5.44-03	3.50-03	2.43-03	1.77-03	1.34-03	1.04-03	8.20-04	6.59-04	5.34-04	4.35-04	3.49-04	2.62-04
15	2.96-02	1.18-02	6.61-03	4.26-03	2.97-03	2.17-03	1.64-03	1.28-03	1.01-03	8.11-04	6.54-04	5.22-04	3.90-04	
14	3.62-02	1.45-02	8.15-03	5.28-03	3.69-03	2.71-03	2.05-03	1.60-03	1.27-03	1.01-03	8.02-04	5.96-04		
13	4.50-02	1.81-02	1.02-02	6.65-03	4.67-03	3.44-03	2.62-03	2.04-03	1.61-03	1.27-03	9.39-04			
12	5.70-02	2.30-02	1.31-02	8.56-03	6.04-03	4.47-03	3.42-03	2.67-03	2.08-03	1.53-03				
11	7.38-02	2.99-02	1.72-02	1.13-02	8.04-03	5.99-03	4.59-03	3.55-03	2.60-03					
10	9.81-02	4.01-02	2.32-02	1.54-02	1.11-02	8.31-03	6.34-03	4.64-03						
9	1.35-01	5.55-02	3.26-02	2.20-02	1.60-02	1.20-02	8.74-03							
8	1.93-01	8.06-02	4.82-02	3.31-02	2.43-02	1.77-02								
7	2.92-01	1.25-01	7.64-02	5.38-02	3.88-02									
6	4.79-01	2.10-01	1.34-01	9.56-02										
5	8.82-01	4.08-01	2.74-01											
4	1.98+00	1.00+00												
3	6.51+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.24-06	6.16-06	5.28-06	4.57-06	3.97-06	3.48-06	3.06-06	2.70-06	2.40-06	2.14-06	1.92-06	1.72-06	1.55-06	1.41-06
45	1.02-05	8.68-06	7.45-06	6.44-06	5.61-06	4.91-06	4.32-06	3.82-06	3.39-06	3.02-06	2.70-06	2.43-06	2.19-06	1.98-06
40	1.48-05	1.26-05	1.08-05	9.38-06	8.16-06	7.14-06	6.28-06	5.55-06	4.92-06	4.38-06	3.92-06	3.51-06	3.16-06	2.85-06
35	2.24-05	1.91-05	1.64-05	1.42-05	1.24-05	1.08-05	9.51-06	8.39-06	7.42-06	6.60-06	5.87-06	5.24-06	4.69-06	4.19-06
30	3.61-05	3.08-05	2.65-05	2.29-05	1.99-05	1.73-05	1.52-05	1.33-05	1.17-05	1.03-05	9.05-06	7.89-06	6.76-06	5.43-06
29	4.01-05	3.42-05	2.94-05	2.54-05	2.20-05	1.92-05	1.68-05	1.47-05	1.29-05	1.13-05	9.79-06	8.36-06	6.70-06	
28	4.47-05	3.81-05	3.27-05	2.83-05	2.45-05	2.13-05	1.86-05	1.62-05	1.41-05	1.22-05	1.04-05	8.31-06		
27	5.00-05	4.27-05	3.66-05	3.16-05	2.73-05	2.37-05	2.06-05	1.79-05	1.54-05	1.31-05	1.04-05			
26	5.62-05	4.79-05	4.11-05	3.54-05	3.06-05	2.64-05	2.29-05	1.96-05	1.66-05	1.31-05				
25	6.35-05	5.41-05	4.63-05	3.98-05	3.43-05	2.95-05	2.52-05	2.12-05	1.67-05					
24	7.20-05	6.13-05	5.24-05	4.49-05	3.84-05	3.28-05	2.74-05	2.15-05						
23	8.22-05	6.98-05	5.95-05	5.07-05	4.30-05	3.58-05	2.79-05							
22	9.42-05	7.98-05	6.77-05	5.71-05	4.74-05	3.68-05								
21	1.09-04	9.15-05	7.69-05	6.34-05	4.90-05									
20	1.26-04	1.05-04	8.62-05	6.62-05										
19	1.46-04	1.19-04	9.08-05											
18	1.67-04	1.27-04												
17	1.80-04													

HE + TE = 1.00+04 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	2.21-38	2.66-38	4.25-38	7.53-38	1.41-37	2.72-37	5.20-37	9.70-37	1.74-36	3.00-36	4.99-36	8.02-36	1.25-35
45	0.00+00	3.23-38	4.65-38	8.92-38	1.73-37	3.23-37	5.77-37	9.90-37	1.65-36	2.66-36	4.19-36	6.45-36	9.73-36	1.44-35
40	0.00+00	4.70-38	7.42-38	1.55-37	3.15-37	5.93-37	1.04-36	1.72-36	2.73-36	4.17-36	6.19-36	8.97-36	1.28-35	1.79-35
35	0.00+00	7.08-38	1.17-37	2.56-37	5.39-37	1.03-36	1.82-36	3.01-36	4.70-36	7.04-36	1.02-35	1.43-35	1.95-35	2.60-35
30	0.00+00	1.14-37	1.94-37	4.39-37	9.49-37	1.86-36	3.35-36	5.61-36	8.87-36	1.34-35	1.94-35	2.72-35	3.67-35	4.79-35
29	0.00+00	1.26-37	2.16-37	4.94-37	1.07-36	2.12-36	3.83-36	6.44-36	1.02-35	1.55-35	2.26-35	3.17-35	4.30-35	5.60-35
28	0.00+00	1.41-37	2.43-37	5.57-37	1.22-36	2.42-36	4.40-36	7.44-36	1.19-35	1.81-35	2.66-35	3.75-35	5.09-35	6.62-35
27	0.00+00	1.57-37	2.74-37	6.32-37	1.39-36	2.78-36	5.08-36	8.66-36	1.39-35	2.14-35	3.15-35	4.47-35	6.10-35	7.94-35
26	0.00+00	1.77-37	3.10-37	7.21-37	1.60-36	3.21-36	5.92-36	1.02-35	1.65-35	2.55-35	3.79-35	5.41-35	7.42-35	9.64-35
25	0.00+00	2.00-37	3.52-37	8.27-37	1.85-36	3.74-36	6.95-36	1.20-35	1.97-35	3.08-35	4.61-35	6.64-35	9.15-35	1.19-34
24	0.00+00	2.28-37	4.04-37	9.55-37	2.15-36	4.39-36	8.23-36	1.44-35	2.38-35	3.76-35	5.69-35	8.28-35	1.15-34	1.48-34
23	0.00+00	2.60-37	4.65-37	1.11-36	2.52-36	5.20-36	9.85-36	1.74-35	2.91-35	4.66-35	7.15-35	1.05-34	1.47-34	1.88-34
22	0.00+00	2.99-37	5.40-37	1.30-36	2.99-36	6.22-36	1.19-35	2.14-35	3.62-35	5.88-35	9.17-35	1.37-34	1.92-34	2.38-34
21	0.00+00	3.47-37	6.32-37	1.54-36	3.57-36	7.54-36	1.46-35	2.66-35	4.59-35	7.58-35	1.20-34	1.82-34	2.55-34	2.97-34
20	0.00+00	4.05-37	7.46-37	1.84-36	4.32-36	9.25-36	1.83-35	3.38-35	5.94-35	1.00-34	1.62-34	2.50-34	3.46-34	3.35-34
19	0.00+00	4.78-37	8.90-37	2.22-36	5.31-36	1.15-35	2.32-35	4.38-35	7.89-35	1.37-34	2.27-34	3.53-34	4.65-34	1.88-34
18	0.00+00	5.69-37	1.07-36	2.73-36	6.62-36	1.47-35	3.02-35	5.84-35	1.08-34	1.93-34	3.31-34	5.16-34	5.59-34	-1.14-33
17	0.00+00	6.84-37	1.31-36	3.39-36	8.41-36	1.91-35	4.03-35	8.06-35	1.55-34	2.87-34	5.06-34	7.58-34	1.28-34	-1.21-32
16	0.00+00	8.34-37	1.63-36	4.30-36	1.09-35	2.55-35	5.57-35	1.16-34	2.33-34	4.54-34	8.19-34	9.32-34	-6.03-33	-2.09-31
15	0.00+00	1.03-36	2.06-36	5.58-36	1.46-35	3.53-35	8.04-35	1.76-34	3.76-34	7.77-34	1.35-33	-1.63-33	-1.40-31	
14	0.00+00	1.30-36	2.65-36	7.43-36	2.02-35	5.11-35	1.23-34	2.89-34	6.68-34	1.46-33	1.24-33	-8.45-32		
13	0.00+00	1.67-36	3.51-36	1.02-35	2.92-35	7.84-35	2.03-34	5.26-34	1.36-33	2.80-33	-4.22-32			
12	0.00+00	2.19-36	4.80-36	1.47-35	4.47-35	1.30-34	3.77-34	1.13-33	3.34-33	-1.26-32				
11	0.00+00	2.97-36	6.82-36	2.24-35	7.42-35	2.44-34	8.34-34	3.14-33	5.39-33					
10	0.00+00	4.18-36	1.02-35	3.69-35	1.39-34	5.49-34	2.51-33	1.37-32						
9	0.00+00	6.18-36	1.66-35	6.84-35	3.15-34	1.73-33	1.50-32							
8	0.00+00	9.77-36	2.99-35	1.53-34	1.02-33	1.20-32								
7	0.00+00	1.71-35	6.44-35	4.90-34	7.57-33									
6	0.00+00	3.48-35	1.94-34	3.69-33										
5	0.00+00	9.48-35	1.34-33											
4	0.00+00	5.25-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.90-35	2.82-35	4.11-35	5.88-35	8.29-35	1.16-34	1.59-34	2.18-34	2.95-34	3.98-34	5.34-34	7.14-34	9.52-34	1.27-33
45	2.10-35	3.02-35	4.29-35	6.02-35	8.38-35	1.16-34	1.59-34	2.17-34	2.95-34	4.00-34	5.42-34	7.35-34	9.97-34	1.36-33
40	2.47-35	3.38-35	4.59-35	6.18-35	8.29-35	1.11-34	1.47-34	1.96-34	2.61-34	3.49-34	4.66-34	6.27-34	8.48-34	1.16-33
35	3.40-35	4.36-35	5.47-35	6.69-35	7.95-35	9.05-35	9.60-35	8.86-35	5.34-35	-3.87-35	-2.47-34	-6.95-34	-1.66-33	-3.80-33
30	6.00-35	7.09-35	7.60-35	6.59-35	2.00-35	-1.05-34	-4.03-34	-1.10-33	-2.72-33	-6.78-33	-1.80-32	-5.53-32	-2.29-31	-2.03-30
29	6.95-35	8.03-35	8.08-35	5.48-35	-3.37-35	-2.66-34	-8.31-34	-2.21-33	-5.74-33	-1.57-32	-4.96-32	-2.10-31	-1.91-30	
28	8.15-35	9.13-35	8.33-35	2.89-35	-1.39-34	-5.79-34	-1.71-33	-4.69-33	-1.34-32	-4.35-32	-1.90-31	-1.77-30		
27	9.66-35	1.04-34	7.94-35	-2.91-35	-3.53-34	-1.24-33	-3.69-33	-1.11-32	-3.74-32	-1.68-31	-1.62-30			
26	1.15-34	1.16-34	5.87-35	-1.60-34	-8.21-34	-2.77-33	-8.88-33	-3.14-32	-1.47-31	-1.47-30				
25	1.39-34	1.24-34	-4.20-36	-4.67-34	-1.95-33	-6.87-33	-2.58-32	-1.26-31	-1.31-30					
24	1.66-34	1.13-34	-1.79-34	-1.25-33	-5.08-33	-2.06-32	-1.06-31	-1.16-30						
23	1.92-34	4.21-35	-6.73-34	-3.53-33	-1.59-32	-8.77-32	-1.01-30							
22	1.99-34	-2.22-34	-2.23-33	-1.17-32	-7.06-32	-8.64-31								
21	1.11-34	-1.19-33	-8.20-33	-5.52-32	-7.29-31									
20	-3.85-34	-5.26-33	-4.16-32	-6.04-31										
19	-2.92-33	-2.99-32	-4.88-31											
18	-2.01-32	-3.83-31												
17	-2.90-31													

HE + TE = 1.00+04 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 1.537-12 4-3 RC = 3.520-13 4-3 EM = 1.492-24 2S RC = 4.126-13 2P RC = 1.124-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.05-03	6.65-04	3.01-04	1.63-04	9.87-05	6.46-05	4.47-05	3.23-05	2.42-05	1.85-05	1.46-05	1.16-05	9.47-06	7.80-06
45	2.34-03	7.87-04	3.68-04	2.05-04	1.27-04	8.45-05	5.94-05	4.34-05	3.28-05	2.54-05	2.01-05	1.62-05	1.32-05	1.09-05
40	2.66-03	9.44-04	4.63-04	2.67-04	1.70-04	1.16-04	8.27-05	6.13-05	4.68-05	3.65-05	2.91-05	2.36-05	1.94-05	1.61-05
35	3.21-03	1.19-03	6.16-04	3.69-04	2.42-04	1.68-04	1.22-04	9.17-05	7.07-05	5.57-05	4.46-05	3.63-05	3.00-05	2.50-05
30	4.39-03	1.68-03	8.98-04	5.55-04	3.72-04	2.63-04	1.94-04	1.47-04	1.14-04	9.04-05	7.28-05	5.95-05	4.92-05	4.11-05
29	4.76-03	1.83-03	9.82-04	6.10-04	4.10-04	2.91-04	2.14-04	1.63-04	1.27-04	1.00-04	8.10-05	6.62-05	5.48-05	4.58-05
28	5.19-03	2.00-03	1.08-03	6.73-04	4.54-04	3.23-04	2.38-04	1.81-04	1.41-04	1.12-04	9.04-05	7.39-05	6.12-05	5.12-05
27	5.69-03	2.20-03	1.19-03	7.46-04	5.04-04	3.59-04	2.66-04	2.03-04	1.58-04	1.25-04	1.01-04	8.29-05	6.86-05	5.74-05
26	6.28-03	2.44-03	1.33-03	8.31-04	5.63-04	4.02-04	2.98-04	2.27-04	1.77-04	1.41-04	1.14-04	9.33-05	7.72-05	6.46-05
25	6.98-03	2.71-03	1.48-03	9.31-04	6.33-04	4.52-04	3.36-04	2.56-04	2.00-04	1.59-04	1.29-04	1.05-04	8.73-05	7.30-05
24	7.80-03	3.04-03	1.67-03	1.05-03	7.14-04	5.12-04	3.80-04	2.91-04	2.27-04	1.81-04	1.46-04	1.20-04	9.92-05	8.29-05
23	8.78-03	3.43-03	1.88-03	1.19-03	8.11-04	5.82-04	4.33-04	3.31-04	2.59-04	2.07-04	1.67-04	1.37-04	1.13-04	9.46-05
22	9.94-03	3.90-03	2.14-03	1.36-03	9.26-04	6.66-04	4.96-04	3.80-04	2.98-04	2.37-04	1.92-04	1.57-04	1.30-04	1.09-04
21	1.13-02	4.46-03	2.46-03	1.56-03	1.07-03	7.67-04	5.72-04	4.39-04	3.44-04	2.74-04	2.22-04	1.82-04	1.50-04	1.25-04
20	1.30-02	5.14-03	2.84-03	1.80-03	1.23-03	8.90-04	6.65-04	5.11-04	4.01-04	3.20-04	2.59-04	2.12-04	1.75-04	1.46-04
19	1.51-02	5.97-03	3.30-03	2.10-03	1.44-03	1.04-03	7.80-04	5.99-04	4.70-04	3.76-04	3.04-04	2.49-04	2.05-04	1.70-04
18	1.77-02	6.99-03	3.88-03	2.47-03	1.70-03	1.23-03	9.23-04	7.10-04	5.58-04	4.46-04	3.61-04	2.94-04	2.42-04	1.99-04
17	2.09-02	8.27-03	4.60-03	2.94-03	2.03-03	1.47-03	1.10-03	8.50-04	6.69-04	5.34-04	4.32-04	3.51-04	2.86-04	2.30-04
16	2.49-02	9.89-03	5.52-03	3.54-03	2.45-03	1.78-03	1.34-03	1.03-03	8.12-04	6.48-04	5.22-04	4.22-04	3.37-04	2.73-04
15	3.01-02	1.20-02	6.70-03	4.31-03	2.99-03	2.18-03	1.64-03	1.27-03	9.98-04	7.96-04	6.37-04	5.05-04	3.77-04	
14	3.68-02	1.47-02	8.26-03	5.33-03	3.71-03	2.71-03	2.05-03	1.59-03	1.25-03	9.88-04	7.77-04	5.76-04		
13	4.57-02	1.83-02	1.04-02	6.72-03	4.70-03	3.44-03	2.61-03	2.02-03	1.58-03	1.23-03	9.08-04			
12	5.79-02	2.33-02	1.32-02	8.64-03	6.08-03	4.48-03	3.40-03	2.63-03	2.03-03	1.48-03				
11	7.49-02	3.03-02	1.74-02	1.14-02	8.08-03	5.98-03	4.54-03	3.47-03	2.52-03					
10	9.96-02	4.06-02	2.35-02	1.56-02	1.11-02	8.26-03	6.24-03	4.50-03						
9	1.37-01	5.63-02	3.29-02	2.21-02	1.59-02	1.19-02	8.52-03							
8	1.96-01	8.17-02	4.87-02	3.32-02	2.41-02	1.73-02								
7	2.97-01	1.26-01	7.70-02	5.37-02	3.82-02									
6	4.86-01	2.13-01	1.35-01	9.44-02										
5	8.94-01	4.12-01	2.72-01											
4	2.00+00	1.00+00												
3	6.56+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.51-06	5.49-06	4.67-06	4.01-06	3.46-06	3.02-06	2.64-06	2.33-06	2.06-06	1.83-06	1.64-06	1.47-06	1.32-06	1.19-06
45	9.16-06	7.75-06	6.61-06	5.69-06	4.93-06	4.30-06	3.78-06	3.33-06	2.95-06	2.63-06	2.35-06	2.11-06	1.90-06	1.72-06
40	1.35-05	1.15-05	9.84-06	8.49-06	7.37-06	6.43-06	5.65-06	4.99-06	4.43-06	3.94-06	3.52-06	3.16-06	2.84-06	2.57-06
35	2.11-05	1.79-05	1.54-05	1.33-05	1.15-05	1.01-05	8.83-06	7.79-06	6.89-06	6.13-06	5.46-06	4.88-06	4.37-06	3.92-06
30	3.47-05	2.95-05	2.53-05	2.18-05	1.89-05	1.65-05	1.44-05	1.26-05	1.11-05	9.79-06	8.61-06	7.58-06	6.50-06	5.27-06
29	3.86-05	3.29-05	2.81-05	2.42-05	2.10-05	1.83-05	1.60-05	1.40-05	1.23-05	1.07-05	9.37-06	8.04-06	6.50-06	
28	4.32-05	3.67-05	3.14-05	2.71-05	2.34-05	2.03-05	1.77-05	1.55-05	1.35-05	1.17-05	1.00-05	8.07-06		
27	4.84-05	4.11-05	3.52-05	3.03-05	2.62-05	2.27-05	1.97-05	1.71-05	1.48-05	1.26-05	1.01-05			
26	5.45-05	4.63-05	3.95-05	3.40-05	2.93-05	2.53-05	2.19-05	1.88-05	1.60-05	1.27-05				
25	6.15-05	5.22-05	4.46-05	3.82-05	3.29-05	2.83-05	2.42-05	2.04-05	1.62-05					
24	6.98-05	5.92-05	5.04-05	4.31-05	3.69-05	3.14-05	2.64-05	2.09-05						
23	7.96-05	6.74-05	5.73-05	4.87-05	4.13-05	3.45-05	2.71-05							
22	9.13-05	7.70-05	6.51-05	5.49-05	4.56-05	3.56-05								
21	1.05-04	8.82-05	7.39-05	6.11-05	4.75-05									
20	1.21-04	1.01-04	8.30-05	6.41-05										
19	1.40-04	1.15-04	8.79-05											
18	1.61-04	1.23-04												
17	1.74-04													

HE + TE = 1.00+04 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.03-38	-2.25-38	-9.30-38	-2.17-37	-3.87-37	-5.62-37	-6.45-37	-4.63-37	2.62-37	1.94-36	5.16-36	1.08-35	1.98-35
45	0.00+00	2.10-38	-3.90-39	-5.40-38	-1.37-37	-2.34-37	-2.81-37	-1.47-37	3.92-37	1.69-36	4.28-36	8.91-36	1.67-35	2.91-35
40	0.00+00	3.92-38	3.19-38	2.60-38	2.62-38	6.99-38	2.45-37	7.13-37	1.75-36	3.77-36	7.41-36	1.36-35	2.37-35	3.95-35
35	0.00+00	6.79-38	8.99-38	1.60-37	3.05-37	5.88-37	1.12-36	2.10-36	3.83-36	6.78-36	1.16-35	1.95-35	3.18-35	5.09-35
30	0.00+00	1.14-37	1.80-37	3.77-37	7.75-37	1.49-36	2.70-36	4.63-36	7.66-36	1.23-35	1.92-35	2.97-35	4.51-35	6.82-35
29	0.00+00	1.27-37	2.05-37	4.36-37	9.08-37	1.75-36	3.17-36	5.41-36	8.86-36	1.41-35	2.18-35	3.31-35	4.96-35	7.38-35
28	0.00+00	1.42-37	2.33-37	5.04-37	1.06-36	2.06-36	3.72-36	6.34-36	1.03-35	1.62-35	2.49-35	3.73-35	5.52-35	8.09-35
27	0.00+00	1.59-37	2.64-37	5.82-37	1.24-36	2.42-36	4.38-36	7.45-36	1.21-35	1.89-35	2.88-35	4.27-35	6.24-35	8.98-35
26	0.00+00	1.79-37	3.01-37	6.72-37	1.44-36	2.84-36	5.17-36	8.82-36	1.43-35	2.23-35	3.38-35	4.97-35	7.17-35	1.01-34
25	0.00+00	2.02-37	3.44-37	7.78-37	1.69-36	3.35-36	6.13-36	1.05-35	1.71-35	2.67-35	4.02-35	5.89-35	8.39-35	1.16-34
24	0.00+00	2.29-37	3.96-37	9.05-37	1.99-36	3.97-36	7.32-36	1.26-35	2.06-35	3.23-35	4.88-35	7.12-35	1.00-34	1.36-34
23	0.00+00	2.62-37	4.57-37	1.06-36	2.35-36	4.74-36	8.82-36	1.53-35	2.52-35	3.98-35	6.02-35	8.79-35	1.23-34	1.61-34
22	0.00+00	3.01-37	5.31-37	1.25-36	2.79-36	5.71-36	1.07-35	1.88-35	3.14-35	4.99-35	7.61-35	1.11-34	1.53-34	1.91-34
21	0.00+00	3.49-37	6.22-37	1.48-36	3.36-36	6.94-36	1.32-35	2.35-35	3.97-35	6.38-35	9.84-35	1.44-34	1.96-34	2.21-34
20	0.00+00	4.07-37	7.34-37	1.77-36	4.07-36	8.55-36	1.65-35	2.99-35	5.12-35	8.38-35	1.31-34	1.93-34	2.53-34	2.25-34
19	0.00+00	4.79-37	8.76-37	2.14-36	5.01-36	1.07-35	2.10-35	3.88-35	6.78-35	1.13-34	1.80-34	2.66-34	3.21-34	7.02-35
18	0.00+00	5.70-37	1.06-36	2.63-36	6.26-36	1.36-35	2.74-35	5.16-35	9.27-35	1.59-34	2.58-34	3.75-34	3.45-34	-9.48-34
17	0.00+00	6.86-37	1.29-36	3.28-36	7.96-36	1.77-35	3.65-35	7.11-35	1.32-34	2.34-34	3.87-34	5.23-34	-6.78-35	-8.33-33
16	0.00+00	8.36-37	1.60-36	4.16-36	1.04-35	2.37-35	5.05-35	1.02-34	1.97-34	3.64-34	6.07-34	5.62-34	-4.50-33	-1.23-31
15	0.00+00	1.03-36	2.03-36	5.39-36	1.38-35	3.28-35	7.28-35	1.54-34	3.15-34	6.10-34	9.47-34	-1.50-33	-8.73-32	
14	0.00+00	1.30-36	2.61-36	7.18-36	1.91-35	4.74-35	1.11-34	2.51-34	5.50-34	1.11-33	6.42-34	-5.60-32		
13	0.00+00	1.67-36	3.46-36	9.89-36	2.76-35	7.25-35	1.82-34	4.51-34	1.09-33	1.96-33	-3.02-32			
12	0.00+00	2.20-36	4.73-36	1.42-35	4.23-35	1.20-34	3.35-34	9.47-34	2.55-33	-1.04-32				
11	0.00+00	2.97-36	6.72-36	2.16-35	7.01-35	2.23-34	7.31-34	2.55-33	2.91-33					
10	0.00+00	4.19-36	1.01-35	3.56-35	1.31-34	4.98-34	2.15-33	1.01-32						
9	0.00+00	6.19-36	1.63-35	6.58-35	2.95-34	1.55-33	1.20-32							
8	0.00+00	9.79-36	2.94-35	1.47-34	9.38-34	1.03-32								
7	0.00+00	1.71-35	6.32-35	4.66-34	6.82-33									
6	0.00+00	3.48-35	1.90-34	3.46-33										
5	0.00+00	9.48-35	1.30-33											
4	0.00+00	5.23-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.39-35	5.50-35	8.57-35	1.30-34	1.92-34	2.78-34	3.96-34	5.57-34	7.75-34	1.07-33	1.46-33	1.99-33	2.70-33	3.65-33
45	4.81-35	7.67-35	1.19-34	1.79-34	2.65-34	3.87-34	5.57-34	7.94-34	1.12-33	1.58-33	2.22-33	3.10-33	4.34-33	6.08-33
40	6.39-35	1.00-34	1.55-34	2.34-34	3.50-34	5.18-34	7.60-34	1.11-33	1.62-33	2.35-33	3.43-33	5.03-33	7.44-33	1.11-32
35	8.02-35	1.25-34	1.91-34	2.92-34	4.43-34	6.72-34	1.02-33	1.55-33	2.38-33	3.71-33	5.87-33	9.53-33	1.60-32	2.83-32
30	1.03-34	1.54-34	2.32-34	3.52-34	5.40-34	8.39-34	1.33-33	2.18-33	3.70-33	6.67-33	1.32-32	3.08-32	9.94-32	7.58-31
29	1.09-34	1.62-34	2.41-34	3.62-34	5.49-34	8.47-34	1.34-33	2.18-33	3.74-33	6.92-33	1.47-32	4.21-32	3.00-31	
28	1.18-34	1.71-34	2.49-34	3.65-34	5.39-34	8.03-34	1.21-33	1.85-33	2.83-33	4.14-33	4.38-33	-5.70-33		
27	1.28-34	1.81-34	2.54-34	3.53-34	4.80-34	6.23-34	6.97-34	3.21-34	-2.36-33	-1.92-32	-2.02-31			
26	1.41-34	1.90-34	2.49-34	3.02-34	3.00-34	6.73-35	-1.05-33	-5.97-33	-3.26-32	-3.18-31				
25	1.55-34	1.96-34	2.17-34	1.54-34	-2.10-34	-1.65-33	-7.56-33	-3.88-32	-3.78-31					
24	1.71-34	1.87-34	1.15-34	-2.65-34	-1.75-33	-7.80-33	-4.01-32	-3.99-31						
23	1.84-34	1.34-34	-1.90-34	-1.53-33	-7.19-33	-3.82-32	-3.93-31							
22	1.77-34	-5.50-35	-1.15-33	-6.07-33	-3.42-32	-3.69-31								
21	9.35-35	-7.14-34	-4.73-33	-2.91-32	-3.35-31									
20	-2.91-34	-3.35-33	-2.36-32	-2.94-31										
19	-2.06-33	-1.81-32	-2.50-31											
18	-1.29-32	-2.06-31												
17	-1.63-31													

HE + TE = 1.00+04 NE = 1.00+05 CASE B NC = 70

TOTAL RC = 1.545-12 4-3 RC = 3.470-13 4-3 EM = 1.471-24 2S RC = 4.176-13 2P RC = 1.127-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.91-03	9.01-04	3.90-04	2.04-04	1.19-04	7.61-05	5.15-05	3.65-05	2.68-05	2.02-05	1.57-05	1.24-05	9.96-06	8.13-06
45	3.61-03	1.12-03	4.90-04	2.57-04	1.52-04	9.72-05	6.60-05	4.69-05	3.45-05	2.62-05	2.03-05	1.61-05	1.30-05	1.06-05
40	4.52-03	1.43-03	6.33-04	3.36-04	2.01-04	1.30-04	8.89-05	6.36-05	4.71-05	3.59-05	2.80-05	2.23-05	1.80-05	1.48-05
35	5.56-03	1.82-03	8.30-04	4.53-04	2.76-04	1.82-04	1.26-04	9.15-05	6.86-05	5.28-05	4.15-05	3.32-05	2.71-05	2.23-05
30	6.70-03	2.33-03	1.13-03	6.41-04	4.05-04	2.73-04	1.94-04	1.43-04	1.09-04	8.48-05	6.73-05	5.44-05	4.46-05	3.70-05
29	6.98-03	2.47-03	1.21-03	6.95-04	4.42-04	3.00-04	2.14-04	1.59-04	1.21-04	9.44-05	7.52-05	6.08-05	4.99-05	4.14-05
28	7.30-03	2.62-03	1.30-03	7.56-04	4.85-04	3.32-04	2.38-04	1.77-04	1.35-04	1.06-04	8.42-05	6.82-05	5.60-05	4.66-05
27	7.67-03	2.79-03	1.41-03	8.28-04	5.35-04	3.68-04	2.65-04	1.98-04	1.52-04	1.19-04	9.48-05	7.69-05	6.32-05	5.26-05
26	8.13-03	3.00-03	1.53-03	9.11-04	5.93-04	4.11-04	2.97-04	2.22-04	1.71-04	1.34-04	1.07-04	8.71-05	7.16-05	5.96-05
25	8.68-03	3.24-03	1.68-03	1.01-03	6.62-04	4.61-04	3.35-04	2.51-04	1.93-04	1.52-04	1.22-04	9.90-05	8.15-05	6.78-05
24	9.37-03	3.53-03	1.85-03	1.12-03	7.42-04	5.19-04	3.79-04	2.85-04	2.20-04	1.74-04	1.39-04	1.13-04	9.31-05	7.74-05
23	1.02-02	3.89-03	2.06-03	1.26-03	8.39-04	5.90-04	4.32-04	3.26-04	2.52-04	1.99-04	1.60-04	1.30-04	1.07-04	8.88-05
22	1.13-02	4.32-03	2.31-03	1.42-03	9.54-04	6.74-04	4.95-04	3.74-04	2.90-04	2.29-04	1.84-04	1.50-04	1.23-04	1.02-04
21	1.26-02	4.85-03	2.61-03	1.62-03	1.09-03	7.75-04	5.71-04	4.33-04	3.36-04	2.66-04	2.14-04	1.74-04	1.43-04	1.19-04
20	1.42-02	5.50-03	2.99-03	1.87-03	1.26-03	8.99-04	6.64-04	5.05-04	3.92-04	3.10-04	2.49-04	2.03-04	1.67-04	1.38-04
19	1.62-02	6.31-03	3.45-03	2.17-03	1.47-03	1.05-03	7.78-04	5.93-04	4.61-04	3.65-04	2.93-04	2.38-04	1.95-04	1.61-04
18	1.87-02	7.32-03	4.02-03	2.54-03	1.73-03	1.24-03	9.21-04	7.02-04	5.47-04	4.33-04	3.48-04	2.82-04	2.30-04	1.88-04
17	2.19-02	8.61-03	4.75-03	3.01-03	2.06-03	1.48-03	1.10-03	8.41-04	6.55-04	5.19-04	4.16-04	3.36-04	2.72-04	2.18-04
16	2.60-02	1.02-02	5.68-03	3.61-03	2.48-03	1.79-03	1.33-03	1.02-03	7.94-04	6.28-04	5.02-04	4.02-04	3.19-04	2.40-04
15	3.12-02	1.24-02	6.88-03	4.39-03	3.03-03	2.19-03	1.63-03	1.25-03	9.75-04	7.69-04	6.10-04	4.80-04	3.57-04	
14	3.80-02	1.51-02	8.46-03	5.43-03	3.75-03	2.72-03	2.04-03	1.56-03	1.21-03	9.51-04	7.41-04	5.46-04		
13	4.72-02	1.88-02	1.06-02	6.83-03	4.74-03	3.45-03	2.58-03	1.98-03	1.53-03	1.18-03	8.62-04			
12	5.96-02	2.39-02	1.35-02	8.78-03	6.12-03	4.46-03	3.35-03	2.56-03	1.95-03	1.41-03				
11	7.71-02	3.11-02	1.77-02	1.16-02	8.12-03	5.94-03	4.46-03	3.36-03	2.40-03					
10	1.02-01	4.16-02	2.39-02	1.58-02	1.11-02	8.17-03	6.07-03	4.31-03						
9	1.40-01	5.77-02	3.36-02	2.23-02	1.59-02	1.16-02	8.18-03							
8	2.01-01	8.37-02	4.95-02	3.34-02	2.39-02	1.67-02								
7	3.05-01	1.29-01	7.81-02	5.36-02	3.71-02									
6	4.98-01	2.17-01	1.36-01	9.25-02										
5	9.17-01	4.18-01	2.69-01											
4	2.05+00	1.00+00												
3	6.65+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.72-06	5.62-06	4.75-06	4.05-06	3.48-06	3.01-06	2.62-06	2.30-06	2.03-06	1.80-06	1.60-06	1.43-06	1.28-06	1.16-06
45	8.79-06	7.36-06	6.23-06	5.32-06	4.58-06	3.96-06	3.46-06	3.03-06	2.68-06	2.37-06	2.11-06	1.89-06	1.70-06	1.53-06
40	1.23-05	1.03-05	8.77-06	7.50-06	6.46-06	5.61-06	4.90-06	4.31-06	3.81-06	3.38-06	3.01-06	2.69-06	2.42-06	2.18-06
35	1.86-05	1.57-05	1.34-05	1.15-05	9.92-06	8.63-06	7.56-06	6.65-06	5.88-06	5.22-06	4.65-06	4.16-06	3.73-06	3.35-06
30	3.10-05	2.63-05	2.24-05	1.93-05	1.67-05	1.45-05	1.27-05	1.12-05	9.83-06	8.68-06	7.66-06	6.74-06	5.84-06	4.78-06
29	3.48-05	2.94-05	2.51-05	2.16-05	1.87-05	1.63-05	1.42-05	1.25-05	1.10-05	9.63-06	8.43-06	7.28-06	5.93-06	
28	3.91-05	3.31-05	2.83-05	2.43-05	2.10-05	1.83-05	1.59-05	1.39-05	1.22-05	1.06-05	9.14-06	7.41-06		
27	4.41-05	3.74-05	3.19-05	2.74-05	2.37-05	2.05-05	1.79-05	1.56-05	1.35-05	1.15-05	9.32-06			
26	5.00-05	4.24-05	3.61-05	3.10-05	2.67-05	2.31-05	2.00-05	1.73-05	1.47-05	1.18-05				
25	5.69-05	4.82-05	4.10-05	3.51-05	3.02-05	2.60-05	2.23-05	1.89-05	1.51-05					
24	6.50-05	5.49-05	4.67-05	3.99-05	3.41-05	2.91-05	2.45-05	1.95-05						
23	7.45-05	6.28-05	5.33-05	4.53-05	3.84-05	3.22-05	2.54-05							
22	8.57-05	7.21-05	6.08-05	5.13-05	4.26-05	3.35-05								
21	9.89-05	8.28-05	6.93-05	5.73-05	4.47-05									
20	1.14-04	9.50-05	7.80-05	6.04-05										
19	1.32-04	1.08-04	8.30-05											
18	1.52-04	1.16-04												
17	1.65-04													

HE + TE = 1.00+04 NE = 1.00+05 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.32-39	-7.05-38	-2.31-37	-5.38-37	-1.03-36	-1.74-36	-2.64-36	-3.65-36	-4.63-36	-5.30-36	-5.28-36	-4.01-36	-7.01-37
45	0.00+00	3.74-39	-7.40-38	-2.50-37	-5.77-37	-1.08-36	-1.75-36	-2.48-36	-3.09-36	-3.21-36	-2.31-36	4.60-37	6.27-36	1.68-35
40	0.00+00	1.42-38	-7.00-38	-2.56-37	-5.91-37	-1.08-36	-1.65-36	-2.10-36	-2.06-36	-8.95-37	2.41-36	9.38-36	2.23-35	4.43-35
35	0.00+00	3.84-38	-3.69-38	-1.95-37	-4.65-37	-8.05-37	-1.06-36	-8.72-37	4.01-37	3.85-36	1.12-35	2.53-35	5.01-35	9.21-35
30	0.00+00	9.17-38	6.25-38	2.25-38	-1.28-38	7.20-38	5.62-37	2.02-36	5.47-36	1.26-35	2.64-35	5.16-35	9.58-35	1.72-34
29	0.00+00	1.08-37	9.39-38	9.37-38	1.36-37	3.56-37	1.07-36	2.89-36	6.91-36	1.50-35	3.05-35	5.84-35	1.08-34	1.92-34
28	0.00+00	1.26-37	1.30-37	1.77-37	3.10-37	6.87-37	1.65-36	3.87-36	8.53-36	1.77-35	3.48-35	6.57-35	1.20-34	2.15-34
27	0.00+00	1.46-37	1.72-37	2.73-37	5.13-37	1.07-36	2.33-36	5.01-36	1.04-35	2.07-35	3.97-35	7.39-35	1.34-34	2.41-34
26	0.00+00	1.70-37	2.19-37	3.84-37	7.49-37	1.52-36	3.13-36	6.34-36	1.25-35	2.41-35	4.52-35	8.30-35	1.50-34	2.70-34
25	0.00+00	1.96-37	2.73-37	5.11-37	1.02-36	2.06-36	4.08-36	7.93-36	1.51-35	2.82-35	5.17-35	9.37-35	1.69-34	3.03-34
24	0.00+00	2.27-37	3.34-37	6.59-37	1.35-36	2.69-36	5.21-36	9.84-36	1.82-35	3.31-35	5.95-35	1.06-34	1.90-34	3.43-34
23	0.00+00	2.62-37	4.04-37	8.32-37	1.73-36	3.45-36	6.61-36	1.22-35	2.20-35	3.92-35	6.91-35	1.22-34	2.17-34	3.91-34
22	0.00+00	3.03-37	4.86-37	1.03-36	2.19-36	4.39-36	8.34-36	1.52-35	2.70-35	4.71-35	8.17-35	1.42-34	2.50-34	4.51-34
21	0.00+00	3.52-37	5.83-37	1.28-36	2.76-36	5.56-36	1.06-35	1.91-35	3.36-35	5.78-35	9.88-35	1.69-34	2.94-34	5.23-34
20	0.00+00	4.12-37	7.00-37	1.58-36	3.46-36	7.06-36	1.35-35	2.44-35	4.26-35	7.27-35	1.23-34	2.06-34	3.50-34	6.00-34
19	0.00+00	4.85-37	8.44-37	1.95-36	4.36-36	9.01-36	1.74-35	3.17-35	5.55-35	9.45-35	1.58-34	2.59-34	4.16-34	6.21-34
18	0.00+00	5.76-37	1.02-36	2.42-36	5.53-36	1.16-35	2.28-35	4.21-35	7.45-35	1.27-34	2.11-34	3.34-34	4.59-34	2.12-34
17	0.00+00	6.92-37	1.26-36	3.04-36	7.12-36	1.53-35	3.06-35	5.77-35	1.04-34	1.80-34	2.96-34	4.23-34	2.21-34	-3.62-33
16	0.00+00	8.42-37	1.56-36	3.88-36	9.33-36	2.06-35	4.24-35	8.23-35	1.53-34	2.70-34	4.30-34	3.97-34	-2.53-33	-6.40-32
15	0.00+00	1.04-36	1.97-36	5.06-36	1.25-35	2.86-35	6.10-35	1.23-34	2.39-34	4.31-34	5.95-34	-1.18-33	-5.06-32	
14	0.00+00	1.31-36	2.55-36	6.75-36	1.73-35	4.14-35	9.27-35	1.98-34	4.06-34	7.32-34	9.24-35	-3.60-32		
13	0.00+00	1.68-36	3.37-36	9.30-36	2.51-35	6.32-35	1.51-34	3.51-34	7.72-34	1.06-33	-2.19-32			
12	0.00+00	2.20-36	4.61-36	1.34-35	3.83-35	1.04-34	2.75-34	7.16-34	1.64-33	-9.67-33				
11	0.00+00	2.99-36	6.56-36	2.03-35	6.33-35	1.92-34	5.87-34	1.82-33	-2.40-34					
10	0.00+00	4.20-36	9.83-36	3.34-35	1.18-34	4.23-34	1.66-33	5.82-33						
9	0.00+00	6.21-36	1.59-35	6.16-35	2.62-34	1.28-33	8.39-33							
8	0.00+00	9.82-36	2.85-35	1.37-34	8.20-34	7.99-33								
7	0.00+00	1.71-35	6.11-35	4.28-34	5.74-33									
6	0.00+00	3.49-35	1.82-34	3.10-33										
5	0.00+00	9.48-35	1.23-33											
4	0.00+00	5.20-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.66-36	1.64-35	3.32-35	5.82-35	9.38-35	1.43-34	2.09-34	2.96-34	4.09-34	5.50-34	7.25-34	9.37-34	1.19-33	1.47-33
45	3.43-35	6.18-35	1.04-34	1.65-34	2.53-34	3.76-34	5.48-34	7.82-34	1.10-33	1.53-33	2.09-33	2.85-33	3.84-33	5.15-33
40	8.01-35	1.36-34	2.22-34	3.50-34	5.39-34	8.14-34	1.21-33	1.78-33	2.60-33	3.78-33	5.48-33	7.95-33	1.16-32	1.70-32
35	1.61-34	2.70-34	4.42-34	7.10-34	1.12-33	1.76-33	2.75-33	4.29-33	6.72-33	1.06-32	1.71-32	2.82-32	4.79-32	8.56-32
30	2.99-34	5.13-34	8.70-34	1.47-33	2.48-33	4.24-33	7.37-33	1.32-32	2.47-32	4.94-32	1.09-31	2.87-31	1.03-30	8.13-30
29	3.37-34	5.83-34	1.00-33	1.72-33	2.97-33	5.23-33	9.45-33	1.78-32	3.59-32	7.99-32	2.11-31	7.61-31	5.98-30	
28	3.79-34	6.62-34	1.15-33	2.02-33	3.60-33	6.57-33	1.25-32	2.53-32	5.67-32	1.50-31	5.41-31	4.24-30		
27	4.27-34	7.54-34	1.34-33	2.41-33	4.45-33	8.52-33	1.74-32	3.90-32	1.03-31	3.71-31	2.90-30			
26	4.82-34	8.65-34	1.57-33	2.92-33	5.64-33	1.15-32	2.60-32	6.86-32	2.46-31	1.90-30				
25	5.48-34	1.00-33	1.87-33	3.63-33	7.44-33	1.67-32	4.40-32	1.56-31	1.19-30					
24	6.26-34	1.17-33	2.26-33	4.63-33	1.03-32	2.69-32	9.42-32	7.03-31						
23	7.22-34	1.38-33	2.79-33	6.13-33	1.56-32	5.28-32	3.76-31							
22	8.39-34	1.64-33	3.48-33	8.42-33	2.64-32	1.69-31								
21	9.69-34	1.90-33	4.11-33	1.05-32	4.29-32									
20	1.04-33	1.74-33	1.71-33	-2.81-32										
19	6.04-34	-2.51-33	-6.29-32											
18	-3.89-33	-7.52-32												
17	-7.35-32													

HE + TE = 1.00+04 NE = 1.00+06 CASE B NC = 70

TOTAL RC = 1.561-12 4-3 RC = 3.399-13 4-3 EM = 1.440-24 2S RC = 4.265-13 2P RC = 1.135-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.19-03	1.29-03	5.54-04	2.87-04	1.68-04	1.06-04	7.16-05	5.05-05	3.70-05	2.78-05	2.15-05	1.69-05	1.36-05	1.11-05
45	5.07-03	1.56-03	6.71-04	3.48-04	2.03-04	1.29-04	8.70-05	6.14-05	4.49-05	3.39-05	2.62-05	2.06-05	1.66-05	1.35-05
40	6.22-03	1.92-03	8.27-04	4.30-04	2.52-04	1.60-04	1.08-04	7.63-05	5.59-05	4.22-05	3.26-05	2.57-05	2.07-05	1.68-05
35	8.04-03	2.49-03	1.08-03	5.64-04	3.32-04	2.12-04	1.43-04	1.02-04	7.46-05	5.64-05	4.37-05	3.45-05	2.78-05	2.27-05
30	1.09-02	3.42-03	1.51-03	7.97-04	4.74-04	3.05-04	2.08-04	1.49-04	1.10-04	8.36-05	6.51-05	5.17-05	4.17-05	3.41-05
29	1.16-02	3.66-03	1.62-03	8.61-04	5.13-04	3.32-04	2.27-04	1.62-04	1.20-04	9.17-05	7.15-05	5.68-05	4.59-05	3.76-05
28	1.23-02	3.91-03	1.74-03	9.31-04	5.58-04	3.62-04	2.49-04	1.78-04	1.32-04	1.01-04	7.90-05	6.29-05	5.09-05	4.18-05
27	1.31-02	4.19-03	1.88-03	1.01-03	6.09-04	3.97-04	2.73-04	1.97-04	1.47-04	1.12-04	8.78-05	7.00-05	5.67-05	4.66-05
26	1.38-02	4.48-03	2.01-03	1.10-03	6.67-04	4.37-04	3.02-04	2.18-04	1.63-04	1.25-04	9.82-05	7.85-05	6.37-05	5.24-05
25	1.46-02	4.80-03	2.16-03	1.20-03	7.34-04	4.84-04	3.37-04	2.44-04	1.83-04	1.41-04	1.11-04	8.86-05	7.20-05	5.94-05
24	1.55-02	5.15-03	2.39-03	1.32-03	8.13-04	5.39-04	3.77-04	2.75-04	2.07-04	1.60-04	1.26-04	1.01-04	8.21-05	6.77-05
23	1.64-02	5.53-03	2.60-03	1.46-03	9.06-04	6.05-04	4.26-04	3.12-04	2.35-04	1.82-04	1.44-04	1.16-04	9.44-05	7.79-05
22	1.73-02	5.97-03	2.86-03	1.62-03	1.02-03	6.85-04	4.85-04	3.57-04	2.71-04	2.10-04	1.66-04	1.34-04	1.09-04	9.03-05
21	1.84-02	6.48-03	3.16-03	1.82-03	1.15-03	7.83-04	5.58-04	4.12-04	3.14-04	2.44-04	1.94-04	1.56-04	1.28-04	1.05-04
20	1.97-02	7.08-03	3.52-03	2.06-03	1.32-03	9.03-04	6.47-04	4.81-04	3.67-04	2.86-04	2.28-04	1.84-04	1.50-04	1.24-04
19	2.13-02	7.82-03	3.97-03	2.35-03	1.53-03	1.05-03	7.59-04	5.66-04	4.33-04	3.39-04	2.69-04	2.17-04	1.77-04	1.46-04
18	2.34-02	8.74-03	4.52-03	2.72-03	1.78-03	1.24-03	8.99-04	6.73-04	5.16-04	4.04-04	3.22-04	2.59-04	2.10-04	1.71-04
17	2.62-02	9.93-03	5.23-03	3.18-03	2.11-03	1.48-03	1.08-03	8.08-04	6.21-04	4.87-04	3.87-04	3.10-04	2.50-04	2.00-04
16	2.99-02	1.15-02	6.14-03	3.78-03	2.53-03	1.78-03	1.30-03	9.82-04	7.56-04	5.92-04	4.69-04	3.73-04	2.95-04	2.22-04
15	3.49-02	1.35-02	7.32-03	4.56-03	3.07-03	2.18-03	1.60-03	1.21-03	9.30-04	7.26-04	5.71-04	4.46-04	3.31-04	
14	4.16-02	1.62-02	8.90-03	5.60-03	3.80-03	2.71-03	1.99-03	1.51-03	1.16-03	8.97-04	6.93-04	5.08-04		
13	5.07-02	2.00-02	1.11-02	7.01-03	4.79-03	3.42-03	2.53-03	1.91-03	1.46-03	1.11-03	8.05-04			
12	6.34-02	2.52-02	1.40-02	8.97-03	6.16-03	4.42-03	3.27-03	2.45-03	1.84-03	1.32-03				
11	8.13-02	3.26-02	1.83-02	1.18-02	8.14-03	5.86-03	4.32-03	3.20-03	2.26-03					
10	1.07-01	4.34-02	2.46-02	1.60-02	1.11-02	8.00-03	5.82-03	4.06-03						
9	1.47-01	5.99-02	3.45-02	2.26-02	1.58-02	1.13-02	7.75-03							
8	2.10-01	8.67-02	5.06-02	3.35-02	2.34-02	1.59-02								
7	3.18-01	1.33-01	7.94-02	5.32-02	3.57-02									
6	5.20-01	2.24-01	1.37-01	8.98-02										
5	9.55-01	4.27-01	2.65-01											
4	2.12+00	1.00+00												
3	6.79+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	9.13-06	7.62-06	6.43-06	5.47-06	4.69-06	4.06-06	3.53-06	3.09-06	2.72-06	2.41-06	2.14-06	1.91-06	1.71-06	1.54-06
45	1.11-05	9.29-06	7.84-06	6.67-06	5.72-06	4.95-06	4.31-06	3.77-06	3.32-06	2.94-06	2.61-06	2.33-06	2.09-06	1.88-06
40	1.39-05	1.16-05	9.80-06	8.34-06	7.16-06	6.19-06	5.39-06	4.72-06	4.16-06	3.68-06	3.27-06	2.92-06	2.61-06	2.35-06
35	1.87-05	1.57-05	1.32-05	1.13-05	9.69-06	8.38-06	7.30-06	6.39-06	5.62-06	4.97-06	4.42-06	3.94-06	3.52-06	3.15-06
30	2.83-05	2.37-05	2.01-05	1.71-05	1.47-05	1.28-05	1.11-05	9.72-06	8.54-06	7.52-06	6.63-06	5.82-06	5.05-06	4.14-06
29	3.12-05	2.62-05	2.22-05	1.90-05	1.63-05	1.41-05	1.23-05	1.07-05	9.42-06	8.26-06	7.23-06	6.25-06	5.11-06	
28	3.47-05	2.91-05	2.47-05	2.11-05	1.81-05	1.57-05	1.36-05	1.19-05	1.04-05	9.08-06	7.82-06	6.36-06		
27	3.88-05	3.26-05	2.76-05	2.36-05	2.03-05	1.76-05	1.52-05	1.33-05	1.15-05	9.87-06	8.01-06			
26	4.36-05	3.67-05	3.11-05	2.66-05	2.29-05	1.97-05	1.71-05	1.48-05	1.26-05	1.02-05				
25	4.95-05	4.16-05	3.53-05	3.01-05	2.59-05	2.23-05	1.92-05	1.63-05	1.31-05					
24	5.65-05	4.75-05	4.03-05	3.44-05	2.94-05	2.51-05	2.13-05	1.70-05						
23	6.50-05	5.47-05	4.63-05	3.93-05	3.34-05	2.81-05	2.24-05							
22	7.53-05	6.32-05	5.33-05	4.50-05	3.76-05	2.97-05								
21	8.77-05	7.34-05	6.15-05	5.10-05	4.00-05									
20	1.02-04	8.51-05	7.01-05	5.46-05										
19	1.20-04	9.77-05	7.55-05											
18	1.39-04	1.06-04												
17	1.52-04													

HE + TE = 1.00+04 NE = 1.00+06 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.77-38	-1.43-37	-4.60-37	-1.12-36	-2.33-36	-4.35-36	-7.51-36	-1.22-35	-1.91-35	-2.87-35	-4.22-35	-6.08-35	-8.64-35
45	0.00+00	-1.49-38	-1.56-37	-5.08-37	-1.23-36	-2.52-36	-4.63-36	-7.86-36	-1.26-35	-1.92-35	-2.84-35	-4.10-35	-5.81-35	-8.17-35
40	0.00+00	-7.37-39	-1.64-37	-5.43-37	-1.30-36	-2.60-36	-4.63-36	-7.57-36	-1.16-35	-1.68-35	-2.34-35	-3.16-35	-4.19-35	-5.50-35
35	0.00+00	6.51-39	-1.72-37	-5.90-37	-1.39-36	-2.70-36	-4.57-36	-6.96-36	-9.62-36	-1.21-35	-1.35-35	-1.26-35	-7.52-36	3.97-36
30	0.00+00	3.72-38	-1.66-37	-6.24-37	-1.47-36	-2.73-36	-4.27-36	-5.60-36	-5.73-36	-2.74-36	6.57-36	2.75-35	6.84-35	1.42-34
29	0.00+00	4.80-38	-1.56-37	-6.13-37	-1.44-36	-2.66-36	-4.04-36	-4.99-36	-4.23-36	5.97-37	1.36-35	4.15-35	9.55-35	1.93-34
28	0.00+00	6.16-38	-1.42-37	-5.90-37	-1.40-36	-2.53-36	-3.71-36	-4.17-36	-2.32-36	4.78-36	2.23-35	5.90-35	1.29-34	2.58-34
27	0.00+00	7.84-38	-1.20-37	-5.51-37	-1.31-36	-2.33-36	-3.24-36	-3.07-36	1.20-37	1.00-35	3.31-35	8.07-35	1.72-34	3.41-34
26	0.00+00	9.94-38	-8.87-38	-4.90-37	-1.18-36	-2.04-36	-2.59-36	-1.64-36	3.20-36	1.65-35	4.65-35	1.08-34	2.27-34	4.49-34
25	0.00+00	1.25-37	-4.64-38	-4.03-37	-9.92-37	-1.64-36	-1.73-36	1.90-37	7.06-36	2.45-35	6.31-35	1.42-34	2.96-34	5.90-34
24	0.00+00	1.58-37	1.01-38	-2.81-37	-7.32-37	-1.09-36	-6.03-37	2.50-36	1.18-35	3.44-35	8.35-35	1.84-34	3.85-34	7.78-34
23	0.00+00	1.97-37	8.32-38	-1.20-37	-3.86-37	-3.83-37	8.29-37	5.37-36	1.76-35	4.64-35	1.09-34	2.38-34	5.00-34	1.03-33
22	0.00+00	2.46-37	1.76-37	8.95-38	6.33-38	5.31-37	2.63-36	8.93-36	2.46-35	6.10-35	1.40-34	3.05-34	6.52-34	1.39-33
21	0.00+00	3.05-37	2.92-37	3.55-37	6.37-37	1.69-36	4.90-36	1.33-35	3.35-35	7.91-35	1.79-34	3.93-34	8.60-34	1.91-33
20	0.00+00	3.76-37	4.35-37	6.88-37	1.36-36	3.17-36	7.78-36	1.89-35	4.45-35	1.02-34	2.29-34	5.12-34	1.16-33	2.72-33
19	0.00+00	4.62-37	6.09-37	1.10-36	2.29-36	5.06-36	1.15-35	2.60-35	5.86-35	1.31-34	2.96-34	6.77-34	1.61-33	4.12-33
18	0.00+00	5.66-37	8.23-37	1.63-36	3.47-36	7.53-36	1.63-35	3.55-35	7.74-35	1.71-34	3.89-34	9.21-34	2.35-33	6.86-33
17	0.00+00	6.93-37	1.09-36	2.29-36	5.02-36	1.08-35	2.30-35	4.87-35	1.04-34	2.29-34	5.28-34	1.31-33	3.72-33	1.36-32
16	0.00+00	8.53-37	1.42-36	3.15-36	7.11-36	1.55-35	3.27-35	6.85-35	1.45-34	3.19-34	7.52-34	1.99-33	6.51-33	3.61-32
15	0.00+00	1.06-36	1.85-36	4.31-36	1.00-35	2.23-35	4.76-35	1.00-34	2.13-34	4.72-34	1.13-33	3.01-33	6.68-33	
14	0.00+00	1.33-36	2.42-36	5.93-36	1.44-35	3.29-35	7.23-35	1.56-34	3.38-34	7.49-34	1.55-33	-5.06-33		
13	0.00+00	1.70-36	3.23-36	8.31-36	2.11-35	5.08-35	1.17-34	2.66-34	5.97-34	1.15-33	-7.13-33			
12	0.00+00	2.24-36	4.43-36	1.21-35	3.26-35	8.39-35	2.10-34	5.18-34	1.16-33	-4.61-33				
11	0.00+00	3.02-36	6.31-36	1.84-35	5.40-35	1.54-34	4.37-34	1.23-33	-5.61-34					
10	0.00+00	4.24-36	9.45-36	3.02-35	9.97-35	3.33-34	1.18-33	3.11-33						
9	0.00+00	6.27-36	1.52-35	5.55-35	2.20-34	9.75-34	5.32-33							
8	0.00+00	9.90-36	2.73-35	1.22-34	6.73-34	5.68-33								
7	0.00+00	1.72-35	5.82-35	3.76-34	4.50-33									
6	0.00+00	3.51-35	1.71-34	2.64-33										
5	0.00+00	9.49-35	1.13-33											
4	0.00+00	5.17-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.22-34	-1.70-34	-2.38-34	-3.31-34	-4.61-34	-6.41-34	-8.89-34	-1.23-33	-1.70-33	-2.34-33	-3.21-33	-4.40-33	-6.01-33	-8.20-33
45	-1.14-34	-1.60-34	-2.25-34	-3.18-34	-4.53-34	-6.47-34	-9.29-34	-1.34-33	-1.92-33	-2.76-33	-3.97-33	-5.71-33	-8.21-33	-1.18-32
40	-7.25-35	-9.74-35	-1.35-34	-1.93-34	-2.86-34	-4.36-34	-6.79-34	-1.07-33	-1.69-33	-2.68-33	-4.25-33	-6.75-33	-1.08-32	-1.74-32
35	2.47-35	5.76-35	1.06-34	1.69-34	2.47-34	3.31-34	3.97-34	3.98-34	2.39-34	-2.73-34	-1.53-33	-4.38-33	-1.07-32	-2.54-32
30	2.69-34	4.80-34	8.23-34	1.38-33	2.26-33	3.70-33	6.06-33	1.01-32	1.73-32	3.11-32	6.13-32	1.40-31	4.31-31	2.77-30
29	3.63-34	6.50-34	1.13-33	1.93-33	3.27-33	5.56-33	9.61-33	1.71-32	3.22-32	6.64-32	1.61-31	5.30-31	3.76-30	
28	4.84-34	8.77-34	1.55-33	2.72-33	4.79-33	8.54-33	1.57-32	3.06-32	6.53-32	1.64-31	5.61-31	4.17-30		
27	6.44-34	1.18-33	2.15-33	3.90-33	7.17-33	1.36-32	2.72-32	5.98-32	1.54-31	5.43-31	4.16-30			
26	8.58-34	1.61-33	3.02-33	5.71-33	1.11-32	2.29-32	5.16-32	1.36-31	4.92-31	3.84-30				
25	1.15-33	2.22-33	4.32-33	8.65-33	1.82-32	4.21-32	1.14-31	4.19-31	3.34-30					
24	1.55-33	3.11-33	6.40-33	1.38-32	3.25-32	8.99-32	3.37-31	2.72-30						
23	2.13-33	4.49-33	9.93-33	2.39-32	6.71-32	2.56-31	2.09-30							
22	3.00-33	6.78-33	1.66-32	4.75-32	1.83-31	1.50-30								
21	4.40-33	1.10-32	3.18-32	1.24-31	1.01-30									
20	6.91-33	2.02-32	7.88-32	6.42-31										
19	1.21-32	4.70-32	3.77-31											
18	2.62-32	2.01-31												
17	9.55-32													

HE + TE = 1.00+04 NE = 1.00+07 CASE B NC = 55

TOTAL RC = 1.592-12 4-3 RC = 3.303-13 4-3 EM = 1.400-24 2S RC = 4.421-13 2P RC = 1.150-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.39-03	1.65-03	7.11-04	3.68-04	2.15-04	1.36-04	9.16-05	6.46-05	4.72-05	3.55-05	2.74-05	2.16-05	1.73-05	1.41-05
45	7.05-03	2.16-03	9.30-04	4.82-04	2.81-04	1.78-04	1.20-04	8.45-05	6.17-05	4.65-05	3.59-05	2.83-05	2.27-05	1.84-05
40	9.20-03	2.82-03	1.21-03	6.29-04	3.67-04	2.33-04	1.57-04	1.10-04	8.07-05	6.08-05	4.69-05	3.69-05	2.96-05	2.41-05
35	1.18-02	3.63-03	1.56-03	8.10-04	4.73-04	3.00-04	2.02-04	1.42-04	1.04-04	7.85-05	6.06-05	4.77-05	3.83-05	3.11-05
30	1.52-02	4.68-03	2.02-03	1.05-03	6.13-04	3.89-04	2.63-04	1.85-04	1.36-04	1.02-04	7.90-05	6.23-05	5.00-05	4.07-05
29	1.61-02	4.96-03	2.14-03	1.11-03	6.52-04	4.14-04	2.79-04	1.97-04	1.44-04	1.09-04	8.41-05	6.63-05	5.32-05	4.33-05
28	1.71-02	5.29-03	2.28-03	1.19-03	6.96-04	4.42-04	2.99-04	2.11-04	1.55-04	1.17-04	9.01-05	7.11-05	5.70-05	4.64-05
27	1.83-02	5.66-03	2.45-03	1.28-03	7.48-04	4.76-04	3.21-04	2.27-04	1.67-04	1.26-04	9.72-05	7.67-05	6.15-05	5.01-05
26	1.97-02	6.09-03	2.64-03	1.38-03	8.08-04	5.15-04	3.48-04	2.46-04	1.81-04	1.36-04	1.06-04	8.33-05	6.69-05	5.45-05
25	2.13-02	6.59-03	2.86-03	1.50-03	8.79-04	5.61-04	3.80-04	2.69-04	1.97-04	1.49-04	1.16-04	9.13-05	7.33-05	5.97-05
24	2.30-02	7.16-03	3.12-03	1.63-03	9.63-04	6.15-04	4.17-04	2.96-04	2.18-04	1.65-04	1.28-04	1.01-04	8.10-05	6.60-05
23	2.50-02	7.81-03	3.41-03	1.79-03	1.06-03	6.79-04	4.62-04	3.28-04	2.42-04	1.83-04	1.42-04	1.12-04	9.03-05	7.37-05
22	2.72-02	8.54-03	3.75-03	1.98-03	1.18-03	7.55-04	5.15-04	3.67-04	2.71-04	2.05-04	1.60-04	1.26-04	1.02-04	8.29-05
21	2.97-02	9.37-03	4.14-03	2.20-03	1.31-03	8.46-04	5.79-04	4.13-04	3.06-04	2.33-04	1.81-04	1.44-04	1.16-04	9.44-05
20	3.23-02	1.03-02	4.59-03	2.46-03	1.47-03	9.56-04	6.57-04	4.71-04	3.50-04	2.67-04	2.08-04	1.65-04	1.33-04	1.09-04
19	3.52-02	1.13-02	5.12-03	2.76-03	1.67-03	1.09-03	7.54-04	5.43-04	4.04-04	3.09-04	2.42-04	1.92-04	1.55-04	1.26-04
18	3.83-02	1.25-02	5.73-03	3.14-03	1.91-03	1.26-03	8.76-04	6.34-04	4.74-04	3.64-04	2.85-04	2.27-04	1.83-04	1.48-04
17	4.16-02	1.39-02	6.48-03	3.60-03	2.22-03	1.48-03	1.03-03	7.52-04	5.65-04	4.35-04	3.41-04	2.71-04	2.17-04	1.74-04
16	4.54-02	1.55-02	7.41-03	4.18-03	2.62-03	1.76-03	1.24-03	9.08-04	6.84-04	5.28-04	4.14-04	3.27-04	2.59-04	1.95-04
15	4.99-02	1.76-02	8.59-03	4.94-03	3.14-03	2.13-03	1.51-03	1.11-03	8.43-04	6.50-04	5.07-04	3.95-04	2.94-04	
14	5.58-02	2.02-02	1.02-02	5.96-03	3.84-03	2.63-03	1.88-03	1.39-03	1.05-03	8.09-04	6.21-04	4.56-04		
13	6.40-02	2.38-02	1.23-02	7.35-03	4.80-03	3.32-03	2.39-03	1.77-03	1.33-03	1.01-03	7.29-04			
12	7.57-02	2.88-02	1.52-02	9.30-03	6.15-03	4.29-03	3.09-03	2.28-03	1.70-03	1.21-03				
11	9.31-02	3.60-02	1.95-02	1.21-02	8.09-03	5.67-03	4.09-03	2.97-03	2.08-03					
10	1.19-01	4.69-02	2.59-02	1.63-02	1.10-02	7.70-03	5.48-03	3.76-03						
9	1.60-01	6.40-02	3.58-02	2.28-02	1.54-02	1.07-02	7.22-03							
8	2.26-01	9.17-02	5.22-02	3.35-02	2.26-02	1.49-02								
7	3.40-01	1.40-01	8.11-02	5.24-02	3.38-02									
6	5.54-01	2.33-01	1.38-01	8.63-02										
5	1.01+00	4.40-01	2.59-01											
4	2.24+00	1.00+00												
3	7.01+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.16-05	9.71-06	8.18-06	6.96-06	5.97-06	5.16-06	4.49-06	3.93-06	3.46-06	3.06-06	2.72-06	2.43-06	2.17-06	1.96-06
45	1.52-05	1.27-05	1.07-05	9.10-06	7.80-06	6.74-06	5.86-06	5.13-06	4.52-06	3.99-06	3.55-06	3.17-06	2.84-06	2.55-06
40	1.99-05	1.66-05	1.40-05	1.19-05	1.02-05	8.80-06	7.66-06	6.70-06	5.89-06	5.21-06	4.62-06	4.12-06	3.69-06	3.32-06
35	2.57-05	2.14-05	1.81-05	1.54-05	1.32-05	1.14-05	9.87-06	8.63-06	7.59-06	6.70-06	5.94-06	5.29-06	4.72-06	4.22-06
30	3.36-05	2.80-05	2.36-05	2.00-05	1.72-05	1.48-05	1.28-05	1.12-05	9.81-06	8.61-06	7.57-06	6.64-06	5.74-06	4.70-06
29	3.57-05	2.98-05	2.51-05	2.13-05	1.83-05	1.58-05	1.37-05	1.19-05	1.04-05	9.10-06	7.94-06	6.84-06	5.58-06	
28	3.83-05	3.20-05	2.69-05	2.29-05	1.96-05	1.69-05	1.46-05	1.27-05	1.10-05	9.60-06	8.24-06	6.69-06		
27	4.13-05	3.45-05	2.90-05	2.47-05	2.11-05	1.82-05	1.57-05	1.36-05	1.17-05	1.00-05	8.12-06			
26	4.50-05	3.75-05	3.16-05	2.68-05	2.29-05	1.97-05	1.69-05	1.46-05	1.24-05	9.98-06				
25	4.93-05	4.11-05	3.46-05	2.93-05	2.50-05	2.14-05	1.83-05	1.55-05	1.24-05					
24	5.45-05	4.54-05	3.82-05	3.24-05	2.75-05	2.34-05	1.97-05	1.57-05						
23	6.08-05	5.07-05	4.25-05	3.59-05	3.03-05	2.54-05	2.01-05							
22	6.84-05	5.70-05	4.77-05	4.00-05	3.33-05	2.63-05								
21	7.78-05	6.46-05	5.38-05	4.45-05	3.49-05									
20	8.93-05	7.38-05	6.05-05	4.72-05										
19	1.03-04	8.41-05	6.51-05											
18	1.19-04	9.17-05												
17	1.32-04													

HE + TE = 1.00+04 NE = 1.00+07 CASE B NC = 55

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-3.12-38	-2.06-37	-6.61-37	-1.64-36	-3.51-36	-6.76-36	-1.21-35	-2.04-35	-3.31-35	-5.19-35	-7.94-35	-1.19-34	-1.76-34
45	0.00+00	-3.83-38	-2.64-37	-8.51-37	-2.12-36	-4.54-36	-8.75-36	-1.57-35	-2.66-35	-4.34-35	-6.86-35	-1.06-34	-1.61-34	-2.40-34
40	0.00+00	-4.34-38	-3.29-37	-1.07-36	-2.67-36	-5.72-36	-1.10-35	-1.98-35	-3.38-35	-5.54-35	-8.83-35	-1.38-34	-2.12-34	-3.23-34
35	0.00+00	-3.93-38	-3.83-37	-1.27-36	-3.16-36	-6.73-36	-1.29-35	-2.31-35	-3.94-35	-6.47-35	-1.04-34	-1.65-34	-2.58-34	-4.03-34
30	0.00+00	-1.39-38	-4.02-37	-1.37-36	-3.41-36	-7.13-36	-1.34-35	-2.34-35	-3.89-35	-6.28-35	-1.00-34	-1.60-34	-2.57-34	-4.17-34
29	0.00+00	-5.40-39	-4.03-37	-1.39-36	-3.44-36	-7.16-36	-1.33-35	-2.31-35	-3.80-35	-6.07-35	-9.60-35	-1.53-34	-2.46-34	-4.04-34
28	0.00+00	4.47-39	-4.04-37	-1.41-36	-3.48-36	-7.19-36	-1.33-35	-2.27-35	-3.68-35	-5.80-35	-9.06-35	-1.43-34	-2.31-34	-3.84-34
27	0.00+00	1.60-38	-4.05-37	-1.43-36	-3.53-36	-7.24-36	-1.32-35	-2.22-35	-3.54-35	-5.46-35	-8.37-35	-1.30-34	-2.10-34	-3.53-34
26	0.00+00	2.96-38	-4.05-37	-1.46-36	-3.59-36	-7.30-36	-1.31-35	-2.17-35	-3.37-35	-5.04-35	-7.48-35	-1.13-34	-1.80-34	-3.06-34
25	0.00+00	4.60-38	-4.04-37	-1.49-36	-3.65-36	-7.36-36	-1.30-35	-2.10-35	-3.15-35	-4.50-35	-6.29-35	-8.97-35	-1.37-34	-2.33-34
24	0.00+00	6.63-38	-3.99-37	-1.51-36	-3.71-36	-7.39-36	-1.28-35	-2.00-35	-2.85-35	-3.75-35	-4.62-35	-5.57-35	-7.18-35	-1.16-34
23	0.00+00	9.19-38	-3.87-37	-1.52-36	-3.73-36	-7.36-36	-1.25-35	-1.86-35	-2.43-35	-2.68-35	-2.20-35	-4.55-36	3.09-35	8.21-35
22	0.00+00	1.25-37	-3.64-37	-1.51-36	-3.71-36	-7.21-36	-1.18-35	-1.63-35	-1.80-35	-1.12-35	1.41-35	7.47-35	1.99-34	4.30-34
21	0.00+00	1.68-37	-3.23-37	-1.46-36	-3.60-36	-6.85-36	-1.06-35	-1.28-35	-8.64-36	1.21-35	6.95-35	2.01-34	4.84-34	1.08-33
20	0.00+00	2.25-37	-2.54-37	-1.34-36	-3.35-36	-6.16-36	-8.68-36	-7.52-36	5.38-36	4.75-35	1.56-34	4.11-34	9.94-34	2.36-33
19	0.00+00	3.01-37	-1.46-37	-1.13-36	-2.88-36	-5.00-36	-5.64-36	5.20-37	2.64-35	1.02-34	2.95-34	7.70-34	1.96-33	5.18-33
18	0.00+00	4.03-37	1.85-38	-7.91-37	-2.10-36	-3.14-36	-9.90-37	1.25-35	5.81-35	1.86-34	5.26-34	1.43-33	4.00-33	1.25-32
17	0.00+00	5.39-37	2.58-37	-2.62-37	-8.90-37	-2.99-37	5.98-36	3.05-35	1.06-34	3.23-34	9.33-34	2.76-33	9.07-33	3.09-32
16	0.00+00	7.20-37	5.99-37	5.25-37	9.31-37	3.94-36	1.63-35	5.73-35	1.82-34	5.53-34	1.71-33	5.87-33	2.61-32	2.38-31
15	0.00+00	9.59-37	1.07-36	1.66-36	3.62-36	1.03-35	3.18-35	9.87-35	3.06-34	9.77-34	3.46-33	1.57-32	1.44-31	
14	0.00+00	1.28-36	1.73-36	3.29-36	7.59-36	1.98-35	5.60-35	1.67-34	5.29-34	1.68-33	6.58-33	7.66-32		
13	0.00+00	1.70-36	2.63-36	5.66-36	1.37-35	3.52-35	9.69-35	2.91-34	9.96-34	4.37-33	3.63-32			
12	0.00+00	2.28-36	3.90-36	9.25-36	2.36-35	6.22-35	1.75-34	5.54-34	2.21-33	1.52-32				
11	0.00+00	3.10-36	5.80-36	1.51-35	4.13-35	1.16-34	3.53-34	1.28-33	6.49-33					
10	0.00+00	4.36-36	8.87-36	2.55-35	7.81-35	2.50-34	9.02-34	3.89-33						
9	0.00+00	6.42-36	1.44-35	4.74-35	1.72-34	7.06-34	3.71-33							
8	0.00+00	9.01-36	2.57-35	1.04-34	5.15-34	3.81-33								
7	0.00+00	1.75-35	5.42-35	3.14-34	3.26-33									
6	0.00+00	3.55-35	1.57-34	2.11-33										
5	0.00+00	9.56-35	1.01-33											
4	0.00+00	5.14-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-2.55-34	-3.66-34	-5.18-34	-7.24-34	-1.00-33	-1.37-33	-1.86-33	-2.50-33	-3.34-33	-4.43-33	-5.84-33	-7.66-33	-9.97-33	-1.29-32
45	-3.53-34	-5.14-34	-7.41-34	-1.06-33	-1.49-33	-2.09-33	-2.90-33	-4.01-33	-5.51-33	-7.55-33	-1.03-32	-1.40-32	-1.90-32	-2.58-32
40	-4.85-34	-7.24-34	-1.07-33	-1.57-33	-2.29-33	-3.32-33	-4.79-33	-6.91-33	-9.96-33	-1.44-32	-2.08-32	-3.03-32	-4.42-32	-6.53-32
35	-6.27-34	-9.72-34	-1.50-33	-2.31-33	-3.56-33	-5.48-33	-8.47-33	-1.32-32	-2.07-32	-3.31-32	-5.40-32	-9.03-32	-1.56-31	-2.84-31
30	-6.88-34	-1.14-33	-1.92-33	-3.26-33	-5.59-33	-9.77-33	-1.75-32	-3.24-32	-6.33-32	-1.33-31	-3.11-31	-8.69-31	-3.36-30	-2.86-29
29	-6.78-34	-1.15-33	-1.99-33	-3.49-33	-6.21-33	-1.13-32	-2.13-32	-4.22-32	-9.00-32	-2.14-31	-6.07-31	-2.39-30	-2.07-29	
28	-6.56-34	-1.15-33	-2.05-33	-3.74-33	-6.96-33	-1.34-32	-2.71-32	-5.86-32	-1.41-31	-4.07-31	-1.63-30	-1.44-29		
27	-6.18-34	-1.12-33	-2.09-33	-4.01-33	-7.94-33	-1.64-32	-3.64-32	-8.94-32	-2.62-31	-1.07-30	-9.58-30			
26	-5.54-34	-1.06-33	-2.09-33	-4.30-33	-9.23-33	-2.11-32	-5.34-32	-1.60-31	-6.65-31	-6.09-30				
25	-4.43-34	-9.13-34	-1.99-33	-4.53-33	-1.10-32	-2.90-32	-9.05-32	-3.88-31	-3.65-30					
24	-2.45-34	-6.11-34	-1.62-33	-4.45-33	-1.31-32	-4.41-32	-2.01-31	-1.99-30						
23	1.21-34	3.97-35	-5.44-34	-3.11-33	-1.44-32	-7.89-32	-8.82-31							
22	8.36-34	1.52-33	2.56-33	3.49-33	-3.01-33	-1.79-31								
21	2.33-33	5.19-33	1.28-32	3.96-32	2.34-31									
20	5.80-33	1.60-32	5.81-32	4.38-31										
19	1.53-32	5.98-32	4.90-31											
18	5.15-32	4.42-31												
17	3.46-31													

HE + TE = 1.00+04 NE = 1.00+08 CASE B NC = 35

TOTAL RC = 1.650-12 4-3 RC = 3.194-13 4-3 EM = 1.354-24 2S RC = 4.688-13 2P RC = 1.181-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.94-03	1.82-03	7.83-04	4.06-04	2.37-04	1.50-04	1.01-04	7.11-05	5.20-05	3.91-05	3.02-05	2.38-05	1.91-05	1.55-05
45	8.10-03	2.48-03	1.07-03	5.53-04	3.23-04	2.04-04	1.37-04	9.69-05	7.08-05	5.33-05	4.12-05	3.24-05	2.60-05	2.11-05
40	1.13-02	3.48-03	1.50-03	7.75-04	4.52-04	2.86-04	1.93-04	1.36-04	9.92-05	7.47-05	5.76-05	4.54-05	3.64-05	2.96-05
35	1.62-02	4.97-03	2.14-03	1.11-03	6.46-04	4.09-04	2.75-04	1.94-04	1.42-04	1.07-04	8.23-05	6.48-05	5.19-05	4.22-05
30	2.33-02	7.14-03	3.07-03	1.59-03	9.27-04	5.87-04	3.95-04	2.78-04	2.03-04	1.53-04	1.18-04	9.29-05	7.44-05	6.05-05
29	2.49-02	7.65-03	3.29-03	1.70-03	9.93-04	6.29-04	4.23-04	2.98-04	2.18-04	1.64-04	1.26-04	9.95-05	7.97-05	6.48-05
28	2.66-02	8.18-03	3.51-03	1.82-03	1.06-03	6.73-04	4.53-04	3.19-04	2.33-04	1.75-04	1.35-04	1.06-04	8.53-05	6.93-05
27	2.84-02	8.73-03	3.75-03	1.94-03	1.13-03	7.18-04	4.83-04	3.41-04	2.49-04	1.87-04	1.44-04	1.14-04	9.10-05	7.40-05
26	3.03-02	9.29-03	4.00-03	2.07-03	1.21-03	7.66-04	5.15-04	3.63-04	2.65-04	2.00-04	1.54-04	1.21-04	9.70-05	7.88-05
25	3.22-02	9.88-03	4.25-03	2.20-03	1.29-03	8.15-04	5.48-04	3.86-04	2.82-04	2.13-04	1.64-04	1.29-04	1.03-04	8.39-05
24	3.42-02	1.05-02	4.52-03	2.34-03	1.37-03	8.68-04	5.84-04	4.12-04	3.01-04	2.26-04	1.75-04	1.37-04	1.10-04	8.92-05
23	3.64-02	1.12-02	4.82-03	2.50-03	1.46-03	9.26-04	6.23-04	4.39-04	3.21-04	2.42-04	1.86-04	1.47-04	1.17-04	9.52-05
22	3.89-02	1.20-02	5.16-03	2.68-03	1.57-03	9.93-04	6.69-04	4.71-04	3.45-04	2.59-04	2.00-04	1.57-04	1.26-04	1.02-04
21	4.19-02	1.29-02	5.56-03	2.89-03	1.69-03	1.07-03	7.23-04	5.10-04	3.73-04	2.81-04	2.16-04	1.70-04	1.36-04	1.10-04
20	4.55-02	1.40-02	6.06-03	3.15-03	1.85-03	1.17-03	7.90-04	5.58-04	4.08-04	3.07-04	2.37-04	1.86-04	1.49-04	1.20-04
19	4.99-02	1.54-02	6.67-03	3.48-03	2.04-03	1.30-03	8.75-04	6.18-04	4.52-04	3.41-04	2.63-04	2.06-04	1.65-04	1.33-04
18	5.52-02	1.71-02	7.43-03	3.88-03	2.28-03	1.45-03	9.82-04	6.94-04	5.09-04	3.83-04	2.95-04	2.32-04	1.84-04	1.48-04
17	6.16-02	1.92-02	8.36-03	4.38-03	2.58-03	1.65-03	1.12-03	7.92-04	5.81-04	4.38-04	3.37-04	2.64-04	2.09-04	1.65-04
16	6.92-02	2.17-02	9.50-03	5.01-03	2.96-03	1.90-03	1.29-03	9.17-04	6.74-04	5.08-04	3.91-04	3.05-04	2.38-04	1.77-04
15	7.80-02	2.47-02	1.09-02	5.79-03	3.45-03	2.23-03	1.52-03	1.08-03	7.97-04	6.01-04	4.61-04	3.54-04	2.61-04	
14	8.83-02	2.83-02	1.27-02	6.80-03	4.09-03	2.66-03	1.82-03	1.30-03	9.62-04	7.24-04	5.49-04	3.99-04		
13	1.00-01	3.27-02	1.49-02	8.14-03	4.96-03	3.25-03	2.25-03	1.61-03	1.19-03	8.85-04	6.35-04			
12	1.14-01	3.83-02	1.79-02	9.98-03	6.17-03	4.09-03	2.85-03	2.05-03	1.50-03	1.06-03				
11	1.33-01	4.59-02	2.22-02	1.26-02	7.94-03	5.32-03	3.72-03	2.66-03	1.84-03					
10	1.58-01	5.68-02	2.84-02	1.66-02	1.06-02	7.18-03	4.99-03	3.37-03						
9	1.98-01	7.37-02	3.82-02	2.29-02	1.48-02	9.97-03	6.57-03							
8	2.64-01	1.01-01	5.44-02	3.32-02	2.15-02	1.38-02								
7	3.83-01	1.51-01	8.30-02	5.11-02	3.16-02									
6	6.11-01	2.47-01	1.38-01	8.20-02										
5	1.11+00	4.57-01	2.51-01											
4	2.42+00	1.00+00												
3	7.34+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.28-05	1.07-05	9.00-06	7.66-06	6.57-06	5.68-06	4.94-06	4.32-06	3.80-06	3.36-06	2.99-06	2.67-06	2.39-06	2.15-06
45	1.74-05	1.45-05	1.23-05	1.04-05	8.94-06	7.72-06	6.71-06	5.87-06	5.17-06	4.57-06	4.06-06	3.62-06	3.25-06	2.92-06
40	2.44-05	2.03-05	1.71-05	1.46-05	1.25-05	1.08-05	9.37-06	8.20-06	7.21-06	6.37-06	5.66-06	5.04-06	4.51-06	4.05-06
35	3.48-05	2.90-05	2.44-05	2.08-05	1.78-05	1.54-05	1.33-05	1.16-05	1.02-05	9.03-06	8.00-06	7.12-06	6.35-06	5.68-06
30	4.98-05	4.15-05	3.49-05	2.97-05	2.54-05	2.19-05	1.89-05	1.65-05	1.44-05	1.27-05	1.11-05	9.73-06	8.41-06	6.86-06
29	5.34-05	4.45-05	3.74-05	3.17-05	2.71-05	2.34-05	2.02-05	1.76-05	1.54-05	1.34-05	1.17-05	1.01-05	8.19-06	
28	5.71-05	4.75-05	4.00-05	3.39-05	2.90-05	2.49-05	2.15-05	1.87-05	1.63-05	1.41-05	1.21-05	9.79-06		
27	6.09-05	5.07-05	4.26-05	3.61-05	3.08-05	2.65-05	2.28-05	1.98-05	1.71-05	1.45-05	1.17-05			
26	6.49-05	5.40-05	4.53-05	3.84-05	3.27-05	2.81-05	2.41-05	2.07-05	1.76-05	1.41-05				
25	6.90-05	5.74-05	4.81-05	4.07-05	3.46-05	2.96-05	2.52-05	2.13-05	1.70-05					
24	7.34-05	6.10-05	5.11-05	4.31-05	3.66-05	3.10-05	2.60-05	2.07-05						
23	7.82-05	6.49-05	5.43-05	4.57-05	3.84-05	3.21-05	2.53-05							
22	8.37-05	6.94-05	5.78-05	4.83-05	4.00-05	3.14-05								
21	9.03-05	7.45-05	6.17-05	5.07-05	3.95-05									
20	9.82-05	8.05-05	6.56-05	5.08-05										
19	1.08-04	8.69-05	6.67-05											
18	1.18-04	8.98-05												
17	1.24-04													

HE + TE = 1.00+04 NE = 1.00+08 CASE B NC = 35

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-3.42-38	-2.25-37	-7.29-37	-1.83-36	-3.96-36	-7.74-36	-1.40-35	-2.41-35	-3.96-35	-6.28-35	-9.66-35	-1.45-34	-2.11-34
45	0.00+00	-4.65-38	-3.08-37	-1.00-36	-2.53-36	-5.48-36	-1.08-35	-1.96-35	-3.40-35	-5.63-35	-9.02-35	-1.40-34	-2.12-34	-3.14-34
40	0.00+00	-6.41-38	-4.32-37	-1.41-36	-3.58-36	-7.82-36	-1.54-35	-2.84-35	-4.97-35	-8.34-35	-1.35-34	-2.14-34	-3.29-34	-4.97-34
35	0.00+00	-8.67-38	-6.10-37	-2.01-36	-5.14-36	-1.13-35	-2.26-35	-4.21-35	-7.47-35	-1.28-34	-2.11-34	-3.41-34	-5.40-34	-8.39-34
30	0.00+00	-1.06-37	-8.40-37	-2.82-36	-7.27-36	-1.62-35	-3.28-35	-6.21-35	-1.13-34	-1.98-34	-3.38-34	-5.68-34	-9.38-34	-1.53-33
29	0.00+00	-1.07-37	-8.85-37	-2.98-36	-7.72-36	-1.72-35	-3.50-35	-6.66-35	-1.21-34	-2.14-34	-3.70-34	-6.28-34	-1.05-33	-1.74-33
28	0.00+00	-1.05-37	-9.27-37	-3.14-36	-8.15-36	-1.82-35	-3.71-35	-7.10-35	-1.30-34	-2.32-34	-4.05-34	-6.94-34	-1.18-33	-1.98-33
27	0.00+00	-1.00-37	-9.63-37	-3.29-36	-8.55-36	-1.92-35	-3.91-35	-7.52-35	-1.39-34	-2.49-34	-4.40-34	-7.66-34	-1.32-33	-2.27-33
26	0.00+00	-9.16-38	-9.91-37	-3.41-36	-8.90-36	-2.00-35	-4.09-35	-7.90-35	-1.47-34	-2.66-34	-4.76-34	-8.41-34	-1.48-33	-2.59-33
25	0.00+00	-7.82-38	-1.01-36	-3.51-36	-9.19-36	-2.07-35	-4.24-35	-8.23-35	-1.54-34	-2.82-34	-5.12-34	-9.21-34	-1.65-33	-2.98-33
24	0.00+00	-5.94-38	-1.02-36	-3.59-36	-9.41-36	-2.12-35	-4.36-35	-8.48-35	-1.60-34	-2.97-34	-5.47-34	-1.01-33	-1.85-33	-3.45-33
23	0.00+00	-3.44-38	-1.02-36	-3.64-36	-9.58-36	-2.16-35	-4.44-35	-8.67-35	-1.65-34	-3.10-34	-5.82-34	-1.10-33	-2.08-33	-4.03-33
22	0.00+00	-2.86-39	-1.01-36	-3.68-36	-9.70-36	-2.18-35	-4.49-35	-8.80-35	-1.69-34	-3.22-34	-6.17-34	-1.20-33	-2.37-33	-4.81-33
21	0.00+00	3.61-38	-9.94-37	-3.72-36	-9.82-36	-2.21-35	-4.53-35	-8.89-35	-1.72-34	-3.33-34	-6.56-34	-1.32-33	-2.74-33	-5.92-33
20	0.00+00	8.37-38	-9.76-37	-3.76-36	-9.97-36	-2.24-35	-4.58-35	-8.97-35	-1.74-34	-3.45-34	-7.00-34	-1.48-33	-3.26-33	-7.70-33
19	0.00+00	1.43-37	-9.53-37	-3.82-36	-1.02-35	-2.27-35	-4.62-35	-9.03-35	-1.76-34	-3.56-34	-7.53-34	-1.69-33	-4.07-33	-1.09-32
18	0.00+00	2.19-37	-9.19-37	-3.87-36	-1.04-35	-2.31-35	-4.64-35	-9.00-35	-1.76-34	-3.63-34	-8.08-34	-1.97-33	-5.41-33	-1.76-32
17	0.00+00	3.19-37	-8.58-37	-3.89-36	-1.05-35	-2.32-35	-4.59-35	-8.71-35	-1.68-34	-3.53-34	-8.38-34	-2.32-33	-7.83-33	-3.66-32
16	0.00+00	4.56-37	-7.43-37	-3.82-36	-1.05-35	-2.27-35	-4.34-35	-7.76-35	-1.40-34	-2.87-34	-7.35-34	-2.52-33	-1.27-32	-1.41-31
15	0.00+00	6.50-37	-5.32-37	-3.54-36	-9.88-36	-2.08-35	-3.63-35	-5.30-35	-6.13-35	-4.75-35	-2.57-35	-5.69-34	-1.65-32	
14	0.00+00	9.31-37	-1.51-37	-2.85-36	-8.27-36	-1.60-35	-1.94-35	7.20-36	1.58-34	8.07-34	4.10-33	3.74-32		
13	0.00+00	1.35-36	5.15-37	-1.43-36	-4.70-36	-5.13-36	1.88-35	1.56-34	8.19-34	4.60-33	4.83-32			
12	0.00+00	1.97-36	1.65-36	1.26-36	2.56-36	1.78-35	1.06-34	5.63-34	3.38-33	3.79-32				
11	0.00+00	2.90-36	3.54-36	6.23-36	1.71-35	6.80-35	3.30-34	1.99-33	2.29-32					
10	0.00+00	4.34-36	6.72-36	1.55-35	4.76-35	1.91-34	1.06-33	1.15-32						
9	0.00+00	6.62-36	1.23-35	3.44-35	1.23-34	6.00-34	5.64-33							
8	0.00+00	1.05-35	2.33-35	8.13-35	3.83-34	3.25-33								
7	0.00+00	1.83-35	4.98-35	2.48-34	2.32-33									
6	0.00+00	3.67-35	1.42-34	1.60-33										
5	0.00+00	9.78-35	8.67-34											
4	0.00+00	5.16-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-3.02-34	-4.23-34	-5.82-34	-7.86-34	-1.04-33	-1.35-33	-1.73-33	-2.16-33	-2.65-33	-3.21-33	-3.83-33	-4.52-33	-5.29-33	-6.16-33
45	-4.56-34	-6.49-34	-9.08-34	-1.25-33	-1.69-33	-2.25-33	-2.93-33	-3.77-33	-4.77-33	-5.95-33	-7.35-33	-9.01-33	-1.10-32	-1.34-32
40	-7.35-34	-1.07-33	-1.54-33	-2.18-33	-3.04-33	-4.18-33	-5.67-33	-7.59-33	-1.01-32	-1.32-32	-1.73-32	-2.26-32	-2.98-32	-3.96-32
35	-1.28-33	-1.94-33	-2.90-33	-4.30-33	-6.32-33	-9.22-33	-1.34-32	-1.93-32	-2.78-32	-4.02-32	-5.90-32	-8.84-32	-1.37-31	-2.23-31
30	-2.48-33	-4.00-33	-6.46-33	-1.04-32	-1.70-32	-2.78-32	-4.63-32	-7.90-32	-1.40-31	-2.65-31	-5.54-31	-1.37-30	-4.70-30	-3.54-29
29	-2.87-33	-4.72-33	-7.78-33	-1.29-32	-2.17-32	-3.70-32	-6.48-32	-1.18-31	-2.27-31	-4.85-31	-1.22-30	-4.26-30	-3.25-29	
28	-3.33-33	-5.61-33	-9.50-33	-1.63-32	-2.85-32	-5.10-32	-9.51-32	-1.88-31	-4.11-31	-1.06-30	-3.75-30	-2.91-29		
27	-3.89-33	-6.73-33	-1.18-32	-2.10-32	-3.86-32	-7.37-32	-1.50-31	-3.35-31	-8.85-31	-3.20-30	-2.53-29			
26	-4.57-33	-8.17-33	-1.49-32	-2.79-32	-5.46-32	-1.14-31	-2.62-31	-7.09-31	-2.63-30	-2.12-29				
25	-5.43-33	-1.01-32	-1.93-32	-3.86-32	-8.24-32	-1.94-31	-5.41-31	-2.06-30	-1.71-29					
24	-6.53-33	-1.27-32	-2.60-32	-5.67-32	-1.37-31	-3.91-31	-1.53-30	-1.31-29						
23	-8.01-33	-1.67-32	-3.71-32	-9.15-32	-2.68-31	-1.08-30	-9.47-30							
22	-1.02-32	-2.31-32	-5.81-32	-1.74-31	-7.16-31	-6.46-30								
21	-1.37-32	-3.51-32	-1.07-31	-4.49-31	-4.16-30									
20	-2.01-32	-6.25-32	-2.68-31	-2.53-30										
19	-3.45-32	-1.51-31	-1.45-30											
18	-7.92-32	-7.82-31												
17	-3.76-31													

HE + TE = 1.00+04 NE = 1.00+09 CASE B NC = 22

TOTAL RC = 1.761-12 4-3 RC = 3.106-13 4-3 EM = 1.316-24 2S RC = 5.149-13 2P RC = 1.246-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.19-03	1.90-03	8.16-04	4.23-04	2.47-04	1.56-04	1.05-04	7.41-05	5.41-05	4.08-05	3.15-05	2.48-05	1.99-05	1.62-05
45	8.52-03	2.61-03	1.12-03	5.82-04	3.39-04	2.15-04	1.45-04	1.02-04	7.45-05	5.61-05	4.33-05	3.41-05	2.73-05	2.22-05
40	1.22-02	3.73-03	1.60-03	8.31-04	4.85-04	3.07-04	2.06-04	1.45-04	1.06-04	8.00-05	6.17-05	4.86-05	3.90-05	3.17-05
35	1.82-02	5.57-03	2.39-03	1.24-03	7.23-04	4.58-04	3.08-04	2.17-04	1.59-04	1.19-04	9.21-05	7.25-05	5.81-05	4.72-05
30	2.85-02	8.76-03	3.76-03	1.95-03	1.14-03	7.19-04	4.83-04	3.40-04	2.49-04	1.87-04	1.44-04	1.14-04	9.09-05	7.39-05
29	3.14-02	9.64-03	4.14-03	2.14-03	1.25-03	7.91-04	5.32-04	3.75-04	2.74-04	2.06-04	1.59-04	1.25-04	1.00-04	8.12-05
28	3.47-02	1.06-02	4.57-03	2.36-03	1.38-03	8.73-04	5.87-04	4.13-04	3.02-04	2.27-04	1.75-04	1.38-04	1.10-04	8.95-05
27	3.83-02	1.17-02	5.04-03	2.61-03	1.52-03	9.63-04	6.48-04	4.56-04	3.33-04	2.50-04	1.93-04	1.52-04	1.21-04	9.87-05
26	4.23-02	1.30-02	5.58-03	2.89-03	1.68-03	1.06-03	7.16-04	5.04-04	3.68-04	2.77-04	2.13-04	1.68-04	1.34-04	1.09-04
25	4.66-02	1.44-02	6.17-03	3.19-03	1.86-03	1.18-03	7.91-04	5.57-04	4.06-04	3.06-04	2.35-04	1.85-04	1.48-04	1.20-04
24	5.17-02	1.59-02	6.81-03	3.53-03	2.05-03	1.30-03	8.74-04	6.15-04	4.49-04	3.37-04	2.60-04	2.04-04	1.63-04	1.32-04
23	5.71-02	1.75-02	7.52-03	3.89-03	2.27-03	1.43-03	9.63-04	6.78-04	4.95-04	3.72-04	2.86-04	2.25-04	1.79-04	1.45-04
22	6.23-02	1.91-02	8.21-03	4.25-03	2.48-03	1.57-03	1.05-03	7.41-04	5.41-04	4.06-04	3.13-04	2.46-04	1.96-04	1.59-04
21	6.81-02	2.09-02	8.98-03	4.65-03	2.71-03	1.71-03	1.15-03	8.10-04	5.91-04	4.44-04	3.42-04	2.68-04	2.14-04	1.73-04
20	7.41-02	2.27-02	9.77-03	5.06-03	2.95-03	1.87-03	1.25-03	8.82-04	6.43-04	4.83-04	3.71-04	2.91-04	2.32-04	1.87-04
19	8.02-02	2.46-02	1.06-02	5.47-03	3.19-03	2.02-03	1.36-03	9.54-04	6.95-04	5.22-04	4.01-04	3.14-04	2.50-04	2.01-04
18	8.64-02	2.65-02	1.14-02	5.90-03	3.44-03	2.18-03	1.46-03	1.03-03	7.49-04	5.62-04	4.31-04	3.37-04	2.67-04	2.13-04
17	9.30-02	2.86-02	1.23-02	6.36-03	3.71-03	2.35-03	1.58-03	1.11-03	8.08-04	6.05-04	4.63-04	3.61-04	2.84-04	2.23-04
16	1.01-01	3.10-02	1.33-02	6.92-03	4.04-03	2.55-03	1.72-03	1.21-03	8.78-04	6.56-04	5.01-04	3.68-04	3.00-04	2.22-04
15	1.11-01	3.42-02	1.47-02	7.64-03	4.46-03	2.83-03	1.90-03	1.33-03	9.69-04	7.22-04	5.48-04	4.17-04	3.04-04	
14	1.25-01	3.84-02	1.66-02	8.63-03	5.04-03	3.20-03	2.15-03	1.51-03	1.09-03	8.10-04	6.05-04	4.34-04		
13	1.43-01	4.42-02	1.91-02	9.97-03	5.84-03	3.71-03	2.49-03	1.75-03	1.26-03	9.21-04	6.49-04			
12	1.66-01	5.17-02	2.25-02	1.18-02	6.94-03	4.42-03	2.97-03	2.08-03	1.48-03	1.02-03				
11	1.97-01	6.18-02	2.72-02	1.44-02	8.50-03	5.43-03	3.65-03	2.52-03	1.70-03					
10	2.36-01	7.54-02	3.37-02	1.80-02	1.08-02	6.92-03	4.62-03	3.04-03						
9	2.88-01	9.45-02	4.33-02	2.36-02	1.43-02	9.19-03	5.87-03							
8	3.64-01	1.24-01	5.87-02	3.29-02	2.01-02	1.24-02								
7	4.88-01	1.73-01	8.58-02	4.90-02	2.89-02									
6	7.26-01	2.69-01	1.38-01	7.68-02										
5	1.25+00	4.78-01	2.42-01											
4	2.66+00	1.00+00												
3	7.80+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.33-05	1.11-05	9.38-06	7.98-06	6.84-06	5.91-06	5.14-06	4.50-06	3.96-06	3.50-06	3.11-06	2.78-06	2.49-06	2.24-06
45	1.83-05	1.53-05	1.29-05	1.10-05	9.40-06	8.12-06	7.06-06	6.18-06	5.44-06	4.81-06	4.27-06	3.81-06	3.41-06	3.07-06
40	2.61-05	2.18-05	1.84-05	1.56-05	1.34-05	1.16-05	1.00-05	8.79-06	7.73-06	6.83-06	6.06-06	5.41-06	4.84-06	4.34-06
35	3.89-05	3.24-05	2.73-05	2.32-05	1.99-05	1.72-05	1.49-05	1.30-05	1.14-05	1.01-05	8.94-06	7.95-06	7.09-06	6.34-06
30	6.08-05	5.07-05	4.26-05	3.62-05	3.09-05	2.66-05	2.31-05	2.01-05	1.76-05	1.54-05	1.35-05	1.18-05	1.02-05	8.33-06
29	6.69-05	5.57-05	4.68-05	3.97-05	3.40-05	2.92-05	2.53-05	2.20-05	1.92-05	1.68-05	1.46-05	1.25-05	1.02-05	
28	7.36-05	6.13-05	5.15-05	4.37-05	3.73-05	3.21-05	2.77-05	2.40-05	2.09-05	1.81-05	1.55-05	1.25-05		
27	8.12-05	6.75-05	5.67-05	4.81-05	4.10-05	3.52-05	3.03-05	2.62-05	2.26-05	1.93-05	1.55-05			
26	8.95-05	7.44-05	6.25-05	5.29-05	4.50-05	3.86-05	3.31-05	2.84-05	2.41-05	1.93-05				
25	9.87-05	8.20-05	6.87-05	5.81-05	4.94-05	4.21-05	3.59-05	3.02-05	2.41-05					
24	1.09-04	9.02-05	7.55-05	6.36-05	5.38-05	4.56-05	3.82-05	3.03-05						
23	1.19-04	9.88-05	8.26-05	6.93-05	5.82-05	4.84-05	3.82-05							
22	1.30-04	1.08-04	8.96-05	7.47-05	6.17-05	4.83-05								
21	1.41-04	1.17-04	9.63-05	7.89-05	6.14-05									
20	1.52-04	1.25-04	1.01-04	7.82-05										
19	1.62-04	1.31-04	9.99-05											
18	1.69-04	1.28-04												
17	1.67-04													

HE + TE = 1.00+04 NE = 1.00+09 CASE B NC = 22

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-3.23-38	-2.27-37	-7.46-37	-1.89-36	-4.11-36	-8.06-36	-1.46-35	-2.50-35	-4.05-35	-6.29-35	-9.40-35	-1.35-34	-1.86-34
45	0.00+00	-4.48-38	-3.15-37	-1.04-36	-2.64-36	-5.78-36	-1.14-35	-2.08-35	-3.58-35	-5.86-35	-9.19-35	-1.39-34	-2.02-34	-2.82-34
40	0.00+00	-6.46-38	-4.54-37	-1.50-36	-3.85-36	-8.48-36	-1.69-35	-3.11-35	-5.41-35	-8.97-35	-1.43-34	-2.19-34	-3.24-34	-4.62-34
35	0.00+00	-9.74-38	-6.87-37	-2.29-36	-5.91-36	-1.31-35	-2.65-35	-4.95-35	-8.76-35	-1.48-34	-2.40-34	-3.78-34	-5.75-34	-8.46-34
30	0.00+00	-1.53-37	-1.09-36	-3.69-36	-9.65-36	-2.16-35	-4.47-35	-8.55-35	-1.55-34	-2.70-34	-4.55-34	-7.44-34	-1.18-33	-1.84-33
29	0.00+00	-1.67-37	-1.21-36	-4.08-36	-1.07-35	-2.43-35	-5.01-35	-9.65-35	-1.76-34	-3.10-34	-5.26-34	-8.70-34	-1.40-33	-2.21-33
28	0.00+00	-1.83-37	-1.34-36	-4.53-36	-1.19-35	-2.72-35	-5.64-35	-1.09-34	-2.01-34	-3.57-34	-6.13-34	-1.03-33	-1.68-33	-2.69-33
27	0.00+00	-2.00-37	-1.48-36	-5.03-36	-1.33-35	-3.05-35	-6.36-35	-1.24-34	-2.31-34	-4.14-34	-7.19-34	-1.22-33	-2.03-33	-3.31-33
26	0.00+00	-2.18-37	-1.63-36	-5.59-36	-1.49-35	-3.42-35	-7.19-35	-1.42-34	-2.66-34	-4.82-34	-8.50-34	-1.47-33	-2.49-33	-4.16-33
25	0.00+00	-2.36-37	-1.80-36	-6.21-36	-1.66-35	-3.85-35	-8.14-35	-1.62-34	-3.07-34	-5.65-34	-1.01-33	-1.78-33	-3.09-33	-5.31-33
24	0.00+00	-2.53-37	-1.99-36	-6.88-36	-1.85-35	-4.32-35	-9.22-35	-1.85-34	-3.57-34	-6.66-34	-1.22-33	-2.19-33	-3.91-33	-6.93-33
23	0.00+00	-2.66-37	-2.18-36	-7.60-36	-2.06-35	-4.84-35	-1.04-34	-2.12-34	-4.15-34	-7.90-34	-1.47-33	-2.73-33	-5.03-33	-9.28-33
22	0.00+00	-2.67-37	-2.34-36	-8.25-36	-2.25-35	-5.35-35	-1.17-34	-2.41-34	-4.79-34	-9.31-34	-1.79-33	-3.41-33	-6.55-33	-1.27-32
21	0.00+00	-2.62-37	-2.51-36	-8.96-36	-2.47-35	-5.92-35	-1.31-34	-2.75-34	-5.58-34	-1.11-33	-2.20-33	-4.38-33	-8.84-33	-1.84-32
20	0.00+00	-2.42-37	-2.65-36	-9.61-36	-2.67-35	-6.49-35	-1.45-34	-3.11-34	-6.48-34	-1.33-33	-2.74-33	-5.74-33	-1.24-32	-2.81-32
19	0.00+00	-1.99-37	-2.74-36	-1.02-35	-2.86-35	-7.02-35	-1.60-34	-3.50-34	-7.51-34	-1.60-33	-3.47-33	-7.74-33	-1.82-32	-4.69-32
18	0.00+00	-1.27-37	-2.78-36	-1.06-35	-3.01-35	-7.50-35	-1.74-34	-3.91-34	-8.70-34	-1.95-33	-4.48-33	-1.09-32	-2.91-32	-9.10-32
17	0.00+00	-2.08-38	-2.75-36	-1.08-35	-3.13-35	-7.92-35	-1.88-34	-4.36-34	-1.01-33	-2.41-33	-6.03-33	-1.66-32	-5.38-32	-2.37-31
16	0.00+00	1.25-37	-2.66-36	-1.10-35	-3.23-35	-8.33-35	-2.03-34	-4.89-34	-1.20-33	-3.10-33	-8.76-33	-2.91-32	-1.33-31	-1.32-30
15	0.00+00	3.18-37	-2.55-36	-1.11-35	-3.36-35	-8.83-35	-2.22-34	-5.63-34	-1.49-33	-4.33-33	-1.47-32	-6.87-32	-7.03-31	
14	0.00+00	5.74-37	-2.40-36	-1.14-35	-3.54-35	-9.54-35	-2.50-34	-6.78-34	-2.01-33	-6.99-33	-3.33-32	-3.47-31		
13	0.00+00	9.29-37	-2.18-36	-1.18-35	-3.78-35	-1.05-34	-2.90-34	-8.70-34	-3.08-33	-1.50-32	-1.59-31			
12	0.00+00	1.45-36	-1.77-36	-1.20-35	-4.04-35	-1.17-34	-3.46-34	-1.21-33	-5.90-33	-6.39-32				
11	0.00+00	2.27-36	-8.95-37	-1.13-35	-4.12-35	-1.24-34	-3.99-34	-1.79-33	-1.88-32					
10	0.00+00	3.63-36	1.01-36	-8.19-36	-3.41-35	-9.58-35	-2.45-34	-8.70-34						
9	0.00+00	5.99-36	5.21-36	2.15-36	4.21-36	1.57-34	3.58-33							
8	0.00+00	1.04-35	1.49-35	3.49-35	1.92-34	3.01-33								
7	0.00+00	1.91-35	3.94-35	1.62-34	1.86-33									
6	0.00+00	3.92-35	1.23-34	1.17-33										
5	0.00+00	1.04-34	7.35-34											
4	0.00+00	5.32-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-2.46-34	-3.12-34	-3.77-34	-4.38-34	-4.91-34	-5.33-34	-5.65-34	-5.71-34	-5.73-34	-5.59-34	-5.29-34	-4.78-34	-4.01-34	-2.91-34
45	-3.79-34	-4.88-34	-6.01-34	-7.13-34	-8.19-34	-9.14-34	-9.99-34	-1.05-33	-1.10-33	-1.13-33	-1.14-33	-1.12-33	-1.06-33	-9.49-34
40	-6.35-34	-8.37-34	-1.06-33	-1.30-33	-1.54-33	-1.80-33	-2.05-33	-2.27-33	-2.54-33	-2.81-33	-3.09-33	-3.38-33	-3.68-33	-3.97-33
35	-1.20-33	-1.65-33	-2.18-33	-2.81-33	-3.53-33	-4.38-33	-5.40-33	-6.53-33	-8.05-33	-1.00-32	-1.28-32	-1.66-32	-2.24-32	-3.17-32
30	-2.77-33	-4.06-33	-5.81-33	-8.18-33	-1.14-32	-1.60-32	-2.29-32	-3.32-32	-5.12-32	-8.48-32	-1.57-31	-3.49-31	-1.08-30	-7.40-30
29	-3.38-33	-5.06-33	-7.42-33	-1.07-32	-1.55-32	-2.27-32	-3.40-32	-5.27-32	-8.86-32	-1.66-31	-3.74-31	-1.17-30	-8.13-30	
28	-4.20-33	-6.43-33	-9.69-33	-1.45-32	-2.18-32	-3.35-32	-5.36-32	-9.07-32	-1.73-31	-3.92-31	-1.24-30	-8.71-30		
27	-5.31-33	-8.35-33	-1.30-32	-2.02-32	-3.20-32	-5.24-32	-9.16-32	-1.75-31	-4.04-31	-1.29-30	-9.19-30			
26	-6.84-33	-1.11-32	-1.80-32	-2.95-32	-4.97-32	-8.88-32	-1.76-31	-4.08-31	-1.32-30	-9.48-30				
25	-9.03-33	-1.53-32	-2.60-32	-4.55-32	-8.36-32	-1.69-31	-4.04-31	-1.32-30	-9.62-30					
24	-1.23-32	-2.18-32	-3.97-32	-7.56-32	-1.57-31	-3.84-31	-1.29-30	-9.51-30						
23	-1.73-32	-3.29-32	-6.52-32	-1.40-31	-3.53-31	-1.21-30	-8.96-30							
22	-2.53-32	-5.25-32	-1.18-31	-3.07-31	-1.08-30	-8.32-30								
21	-3.99-32	-9.37-32	-2.55-31	-9.35-31	-7.41-30									
20	-6.92-32	-1.97-31	-7.56-31	-6.22-30										
19	-1.40-31	-5.65-31	-4.87-30											
18	-3.85-31	-3.49-30												
17	-2.26-30													

HE + TE = 1.00+04 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 1.974-12 4-3 αC = 3.119-13 4-3 EM = 1.322-24 2S RC = 5.962-13 2P RC = 1.378-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.18-03	1.89-03	8.14-04	4.22-04	2.46-04	1.56-04	1.05-04	7.39-05	5.40-05	4.07-05	3.14-05	2.47-05	1.98-05	1.61-05
45	8.52-03	2.61-03	1.12-03	5.82-04	3.39-04	2.15-04	1.45-04	1.02-04	7.45-05	5.61-05	4.33-05	3.41-05	2.73-05	2.22-05
40	1.22-02	3.75-03	1.61-03	8.34-04	4.86-04	3.08-04	2.07-04	1.46-04	1.07-04	8.04-05	6.20-05	4.88-05	3.91-05	3.18-05
35	1.84-02	5.65-03	2.43-03	1.26-03	7.33-04	4.64-04	3.12-04	2.20-04	1.61-04	1.21-04	9.33-05	7.34-05	5.88-05	4.79-05
30	2.96-02	9.08-03	3.90-03	2.02-03	1.18-03	7.45-04	5.01-04	3.53-04	2.58-04	1.94-04	1.50-04	1.18-04	9.43-05	7.66-05
29	3.29-02	1.01-02	4.33-03	2.24-03	1.31-03	8.27-04	5.56-04	3.92-04	2.86-04	2.15-04	1.66-04	1.31-04	1.05-04	8.49-05
28	3.66-02	1.12-02	4.82-03	2.50-03	1.46-03	9.21-04	6.19-04	4.36-04	3.19-04	2.40-04	1.85-04	1.45-04	1.16-04	9.45-05
27	4.09-02	1.26-02	5.39-03	2.79-03	1.63-03	1.03-03	6.92-04	4.87-04	3.56-04	2.68-04	2.06-04	1.62-04	1.30-04	1.05-04
26	4.60-02	1.41-02	6.05-03	3.13-03	1.83-03	1.16-03	7.77-04	5.47-04	3.99-04	3.00-04	2.31-04	1.82-04	1.45-04	1.18-04
25	5.18-02	1.59-02	6.82-03	3.53-03	2.06-03	1.30-03	8.75-04	6.16-04	4.49-04	3.38-04	2.60-04	2.05-04	1.64-04	1.33-04
24	5.86-02	1.80-02	7.72-03	3.99-03	2.33-03	1.47-03	9.89-04	6.96-04	5.08-04	3.82-04	2.94-04	2.31-04	1.85-04	1.50-04
23	6.66-02	2.04-02	8.76-03	4.53-03	2.64-03	1.67-03	1.12-03	7.90-04	5.77-04	4.33-04	3.33-04	2.62-04	2.09-04	1.70-04
22	7.59-02	2.33-02	9.99-03	5.17-03	3.01-03	1.90-03	1.28-03	9.00-04	6.57-04	4.93-04	3.79-04	2.98-04	2.38-04	1.92-04
21	8.69-02	2.66-02	1.14-02	5.91-03	3.44-03	2.18-03	1.46-03	1.03-03	7.50-04	5.63-04	4.33-04	3.40-04	2.71-04	2.19-04
20	9.94-02	3.05-02	1.31-02	6.77-03	3.94-03	2.49-03	1.67-03	1.18-03	8.57-04	6.43-04	4.94-04	3.87-04	3.08-04	2.49-04
19	1.14-01	3.50-02	1.50-02	7.76-03	4.52-03	2.86-03	1.92-03	1.35-03	9.82-04	7.36-04	5.65-04	4.42-04	3.51-04	2.82-04
18	1.31-01	4.01-02	1.72-02	8.90-03	5.18-03	3.27-03	2.20-03	1.54-03	1.12-03	8.41-04	6.45-04	5.03-04	3.98-04	3.18-04
17	1.50-01	4.58-02	1.97-02	1.02-02	5.91-03	3.74-03	2.51-03	1.76-03	1.28-03	9.56-04	7.31-04	5.69-04	4.47-04	3.50-04
16	1.69-01	5.19-02	2.23-02	1.15-02	6.70-03	4.23-03	2.83-03	1.99-03	1.44-03	1.08-03	8.20-04	6.33-04	4.89-04	3.61-04
15	1.90-01	5.81-02	2.49-02	1.29-02	7.49-03	4.72-03	3.16-03	2.21-03	1.60-03	1.19-03	9.03-04	6.85-04	4.98-04	
14	2.09-01	6.40-02	2.74-02	1.42-02	8.24-03	5.20-03	3.48-03	2.43-03	1.75-03	1.30-03	9.63-04	6.89-04		
13	2.28-01	6.98-02	2.99-02	1.55-02	8.98-03	5.66-03	3.78-03	2.63-03	1.89-03	1.37-03	9.60-04			
12	2.49-01	7.64-02	3.28-02	1.69-02	9.84-03	6.19-03	4.12-03	2.85-03	2.01-03	1.38-03				
11	2.80-01	8.60-02	3.69-02	1.91-02	1.11-02	6.95-03	4.60-03	3.13-03	2.09-03					
10	3.28-01	1.01-01	4.34-02	2.24-02	1.30-02	8.12-03	5.30-03	3.41-03						
9	3.99-01	1.23-01	5.33-02	2.76-02	1.60-02	9.87-03	6.10-03							
8	5.06-01	1.58-01	6.88-02	3.58-02	2.06-02	1.21-02								
7	6.71-01	2.13-01	9.43-02	4.93-02	2.73-02									
6	9.52-01	3.10-01	1.41-01	7.21-02										
5	1.53+00	5.12-01	2.32-01											
4	3.03+00	1.00+00												
3	8.39+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.33-05	1.11-05	9.36-06	7.96-06	6.83-06	5.90-06	5.13-06	4.49-06	3.95-06	3.50-06	3.11-06	2.77-06	2.49-06	2.24-06
45	1.83-05	1.53-05	1.29-05	1.10-05	9.40-06	8.12-06	7.06-06	6.18-06	5.44-06	4.81-06	4.27-06	3.81-06	3.41-06	3.07-06
40	2.62-05	2.19-05	1.84-05	1.57-05	1.34-05	1.16-05	1.01-05	8.82-06	7.76-06	6.86-06	6.09-06	5.43-06	4.86-06	4.36-06
35	3.94-05	3.29-05	2.77-05	2.35-05	2.02-05	1.74-05	1.51-05	1.32-05	1.16-05	1.02-05	9.06-06	8.06-06	7.19-06	6.43-06
30	6.31-05	5.25-05	4.42-05	3.75-05	3.21-05	2.76-05	2.39-05	2.08-05	1.82-05	1.60-05	1.40-05	1.23-05	1.06-05	8.64-06
29	6.99-05	5.82-05	4.90-05	4.15-05	3.55-05	3.06-05	2.64-05	2.30-05	2.01-05	1.75-05	1.53-05	1.31-05	1.07-05	
28	7.78-05	6.47-05	5.44-05	4.61-05	3.94-05	3.39-05	2.93-05	2.54-05	2.21-05	1.91-05	1.64-05	1.32-05		
27	8.68-05	7.22-05	6.06-05	5.14-05	4.38-05	3.76-05	3.24-05	2.80-05	2.42-05	2.06-05	1.66-05			
26	9.71-05	8.08-05	6.78-05	5.74-05	4.89-05	4.18-05	3.59-05	3.08-05	2.61-05	2.09-05				
25	1.09-04	9.07-05	7.60-05	6.42-05	5.46-05	4.66-05	3.97-05	3.34-05	2.67-05					
24	1.23-04	1.02-04	8.55-05	7.20-05	6.10-05	5.16-05	4.32-05	3.43-05						
23	1.39-04	1.15-04	9.62-05	8.08-05	6.79-05	5.65-05	4.45-05							
22	1.58-04	1.30-04	1.08-04	9.03-05	7.48-05	5.84-05								
21	1.79-04	1.47-04	1.22-04	9.95-05	7.73-05									
20	2.02-04	1.65-04	1.34-04	1.03-04										
19	2.28-04	1.83-04	1.40-04											
18	2.52-04	1.91-04												
17	2.62-04													

HE + TE = 1.00+04 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.78-32	-2.95-38	-2.25-37	-7.42-37	-1.86-36	-4.00-36	-7.69-36	-1.36-35	-2.21-35	-3.33-35	-4.58-35	-5.68-35	-6.27-35	-6.14-35
45	1.21-31	-4.12-38	-3.14-37	-1.04-36	-2.61-36	-5.64-36	-1.09-35	-1.94-35	-3.18-35	-4.84-35	-6.74-35	-8.47-35	-9.52-35	-9.55-35
40	1.72-31	-6.01-38	-4.55-37	-1.51-36	-3.83-36	-8.33-36	-1.63-35	-2.91-35	-4.85-35	-7.48-35	-1.06-34	-1.36-34	-1.56-34	-1.62-34
35	2.58-31	-9.27-38	-6.98-37	-2.33-36	-5.96-36	-1.31-35	-2.59-35	-4.72-35	-7.98-35	-1.26-34	-1.82-34	-2.41-34	-2.88-34	-3.13-34
30	4.11-31	-1.54-37	-1.15-36	-3.88-36	-1.01-35	-2.25-35	-4.54-35	-8.46-35	-1.47-34	-2.40-34	-3.62-34	-5.00-34	-6.35-34	-7.43-34
29	4.55-31	-1.72-37	-1.29-36	-4.34-36	-1.13-35	-2.54-35	-5.15-35	-9.67-35	-1.70-34	-2.79-34	-4.25-34	-5.95-34	-7.67-34	-9.16-34
28	5.07-31	-1.93-37	-1.44-36	-4.89-36	-1.28-35	-2.88-35	-5.89-35	-1.11-34	-1.97-34	-3.27-34	-5.04-34	-7.17-34	-9.40-34	-1.15-33
27	5.66-31	-2.18-37	-1.63-36	-5.52-36	-1.45-35	-3.29-35	-6.77-35	-1.29-34	-2.30-34	-3.87-34	-6.05-34	-8.74-34	-1.17-33	-1.46-33
26	6.35-31	-2.47-37	-1.84-36	-6.27-36	-1.66-35	-3.78-35	-7.84-35	-1.51-34	-2.72-34	-4.63-34	-7.35-34	-1.08-33	-1.48-33	-1.91-33
25	7.15-31	-2.80-37	-2.09-36	-7.16-36	-1.90-35	-4.38-35	-9.14-35	-1.78-34	-3.25-34	-5.60-34	-9.06-34	-1.36-33	-1.92-33	-2.55-33
24	8.10-31	-3.19-37	-2.39-36	-8.22-36	-2.20-35	-5.10-35	-1.08-34	-2.11-34	-3.92-34	-6.89-34	-1.14-33	-1.75-33	-2.54-33	-3.52-33
23	9.23-31	-3.65-37	-2.74-36	-9.49-36	-2.56-35	-5.98-35	-1.28-34	-2.54-34	-4.80-34	-8.59-34	-1.45-33	-2.31-33	-3.47-33	-5.04-33
22	1.06-30	-4.18-37	-3.16-36	-1.10-35	-2.99-35	-7.07-35	-1.53-34	-3.10-34	-5.96-34	-1.09-33	-1.90-33	-3.13-33	-4.92-33	-7.54-33
21	1.22-30	-4.79-37	-3.66-36	-1.28-35	-3.52-35	-8.43-35	-1.85-34	-3.82-34	-7.52-34	-1.42-33	-2.55-33	-4.39-33	-7.29-33	-1.20-32
20	1.42-30	-5.44-37	-4.23-36	-1.50-35	-4.16-35	-1.01-34	-2.26-34	-4.76-34	-9.62-34	-1.88-33	-3.53-33	-6.39-33	-1.14-32	-2.05-32
19	1.66-30	-6.17-37	-4.90-36	-1.76-35	-4.94-35	-1.22-34	-2.78-34	-6.03-34	-1.26-33	-2.56-33	-5.08-33	-9.86-33	-1.92-32	-3.95-32
18	1.96-30	-6.89-37	-5.67-36	-2.06-35	-5.88-35	-1.48-34	-3.47-34	-7.77-34	-1.69-33	-3.62-33	-7.68-33	-1.64-32	-3.63-32	-9.10-32
17	2.34-30	-7.47-37	-6.51-36	-2.41-35	-7.00-35	-1.81-34	-4.36-34	-1.02-33	-2.33-33	-5.34-33	-1.24-32	-3.01-32	-8.14-32	-2.89-31
16	2.83-30	-7.71-37	-7.36-36	-2.78-35	-8.27-35	-2.20-34	-5.51-34	-1.35-33	-3.31-33	-8.30-33	-2.20-32	-6.50-32	-2.50-31	-2.00-30
15	3.46-30	-7.22-37	-8.11-36	-3.16-35	-9.65-35	-2.65-34	-6.98-34	-1.82-33	-4.89-33	-1.40-32	-4.52-32	-1.90-31	-1.65-30	
14	4.30-30	-5.51-37	-8.61-36	-3.49-35	-1.10-34	-3.17-34	-8.86-34	-2.52-33	-7.68-33	-2.68-32	-1.23-31	-1.18-30		
13	5.44-30	-2.04-37	-8.76-36	-3.75-35	-1.24-34	-3.75-34	-1.14-33	-3.66-33	-1.35-32	-6.70-32	-7.00-31			
12	7.03-30	3.60-37	-8.56-36	-3.96-35	-1.38-34	-4.51-34	-1.53-33	-5.92-33	-3.08-32	-3.45-31				
11	9.31-30	1.20-36	-8.20-36	-4.25-35	-1.59-34	-5.77-34	-2.34-33	-1.26-32	-1.46-31					
10	1.27-29	2.46-36	-7.73-36	-4.76-35	-1.98-34	-8.48-34	-4.73-33	-5.64-32						
9	1.81-29	4.56-36	-6.70-36	-5.60-35	-2.76-34	-1.60-33	-1.95-32							
8	2.72-29	8.49-36	-3.36-36	-6.65-35	-4.42-34	-5.29-33								
7	4.39-29	1.69-35	8.87-36	-5.78-35	-6.99-34									
6	7.89-29	3.80-35	6.29-35	3.71-34										
5	1.69-28	1.07-34	5.08-34											
4	5.05-28	5.53-34												
3	3.66-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.17-35	-3.36-35	-6.78-36	2.89-35	7.43-35	1.33-34	2.03-34	2.88-34	3.92-34	5.20-34	6.76-34	8.70-34	1.11-33	1.41-33
45	-8.36-35	-5.88-35	-2.04-35	3.27-35	1.02-34	1.96-34	3.11-34	4.55-34	6.39-34	8.74-34	1.17-33	1.56-33	2.07-33	2.74-33
40	-1.49-34	-1.15-34	-5.85-35	2.51-35	1.41-34	3.06-34	5.17-34	8.00-34	1.16-33	1.70-33	2.42-33	3.42-33	4.86-33	6.95-33
35	-3.09-34	-2.68-34	-1.84-34	-4.45-35	1.68-34	5.03-34	9.74-34	1.67-33	2.73-33	4.36-33	6.95-33	1.12-32	1.87-32	3.27-32
30	-8.09-34	-8.14-34	-7.34-34	-5.25-34	-1.09-34	7.30-34	2.18-33	4.92-33	1.04-32	2.21-32	5.09-32	1.37-31	5.05-31	4.08-30
29	-1.02-33	-1.07-33	-1.02-33	-8.17-34	-3.58-34	6.72-34	2.60-33	6.60-33	1.55-32	3.78-32	1.06-31	4.00-31	3.31-30	
28	-1.32-33	-1.43-33	-1.44-33	-1.29-33	-8.19-34	4.32-34	3.05-33	9.22-33	2.53-32	7.59-32	3.01-31	2.56-30		
27	-1.74-33	-1.97-33	-2.11-33	-2.09-33	-1.70-33	-2.46-34	3.36-33	1.36-32	4.80-32	2.08-31	1.87-30			
26	-2.35-33	-2.79-33	-3.20-33	-3.51-33	-3.49-33	-2.09-33	2.71-33	2.17-32	1.19-31	1.21-30				
25	-3.28-33	-4.11-33	-5.08-33	-6.21-33	-7.41-33	-7.37-33	-2.77-33	3.68-32	5.89-31					
24	-4.74-33	-6.34-33	-8.56-33	-1.19-32	-1.72-32	-2.52-32	-3.96-32	1.39-32						
23	-7.20-33	-1.04-32	-1.56-32	-2.53-32	-4.69-32	-1.09-31	-5.18-31							
22	-1.16-32	-1.85-32	-3.21-32	-6.46-32	-1.76-31	-9.98-31								
21	-2.03-32	-3.71-32	-7.92-32	-2.29-31	-1.42-30									
20	-3.96-32	-8.84-32	-2.68-31	-1.77-30										
19	-9.31-32	-2.96-31	-2.04-30											
18	-3.04-31	-2.19-30												
17	-2.18-30													

HE + TE = 1.00+04 NE = 1.00+11 CASE B NC = 20

TOTAL RC = 2.409-12 4-3 RC = 3.504-13 4-3 EM = 1.485-24 2S RC = 7.030-13 2P RC = 1.706-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.50-03	1.69-03	7.25-04	3.76-04	2.19-04	1.39-04	9.34-05	6.58-05	4.81-05	3.62-05	2.80-05	2.20-05	1.77-05	1.44-05
45	7.59-03	2.33-03	1.00-03	5.18-04	3.02-04	1.91-04	1.29-04	9.08-05	6.64-05	5.00-05	3.86-05	3.04-05	2.43-05	1.98-05
40	1.09-02	3.34-03	1.44-03	7.44-04	4.34-04	2.75-04	1.85-04	1.30-04	9.52-05	7.17-05	5.53-05	4.35-05	3.49-05	2.84-05
35	1.64-02	5.05-03	2.17-03	1.12-03	6.55-04	4.15-04	2.79-04	1.96-04	1.44-04	1.08-04	8.33-05	6.56-05	5.26-05	4.28-05
30	2.66-02	8.15-03	3.50-03	1.81-03	1.06-03	6.69-04	4.50-04	3.17-04	2.31-04	1.74-04	1.34-04	1.06-04	8.46-05	6.88-05
29	2.96-02	9.06-03	3.89-03	2.02-03	1.18-03	7.44-04	5.00-04	3.52-04	2.57-04	1.94-04	1.49-04	1.17-04	9.40-05	7.64-05
28	3.30-02	1.01-02	4.35-03	2.25-03	1.31-03	8.30-04	5.58-04	3.93-04	2.87-04	2.16-04	1.66-04	1.31-04	1.05-04	8.51-05
27	3.70-02	1.13-02	4.87-03	2.52-03	1.47-03	9.30-04	6.26-04	4.40-04	3.22-04	2.42-04	1.86-04	1.47-04	1.17-04	9.53-05
26	4.17-02	1.28-02	5.49-03	2.84-03	1.66-03	1.05-03	7.04-04	4.96-04	3.62-04	2.72-04	2.10-04	1.65-04	1.32-04	1.07-04
25	4.72-02	1.45-02	6.21-03	3.21-03	1.87-03	1.19-03	7.97-04	5.61-04	4.09-04	3.08-04	2.37-04	1.86-04	1.49-04	1.21-04
24	5.37-02	1.65-02	7.07-03	3.66-03	2.13-03	1.35-03	9.06-04	6.38-04	4.66-04	3.50-04	2.69-04	2.12-04	1.69-04	1.37-04
23	6.15-02	1.88-02	8.09-03	4.19-03	2.44-03	1.54-03	1.04-03	7.30-04	5.32-04	4.00-04	3.08-04	2.42-04	1.93-04	1.57-04
22	7.08-02	2.17-02	9.32-03	4.82-03	2.81-03	1.78-03	1.19-03	8.40-04	6.12-04	4.60-04	3.54-04	2.78-04	2.22-04	1.80-04
21	8.22-02	2.52-02	1.08-02	5.59-03	3.26-03	2.06-03	1.38-03	9.73-04	7.09-04	5.32-04	4.09-04	3.21-04	2.56-04	2.07-04
20	9.60-02	2.94-02	1.26-02	6.53-03	3.80-03	2.40-03	1.61-03	1.13-03	8.27-04	6.20-04	4.77-04	3.73-04	2.97-04	2.40-04
19	1.13-01	3.46-02	1.49-02	7.68-03	4.47-03	2.83-03	1.90-03	1.33-03	9.71-04	7.28-04	5.59-04	4.37-04	3.47-04	2.79-04
18	1.34-01	4.11-02	1.76-02	9.11-03	5.30-03	3.35-03	2.25-03	1.58-03	1.15-03	8.60-04	6.59-04	5.15-04	4.07-04	3.24-04
17	1.60-01	4.92-02	2.11-02	1.09-02	6.34-03	4.00-03	2.68-03	1.88-03	1.37-03	1.02-03	7.83-04	6.08-04	4.78-04	3.74-04
16	1.93-01	5.92-02	2.54-02	1.31-02	7.63-03	4.82-03	3.23-03	2.26-03	1.64-03	1.22-03	9.32-04	7.19-04	5.55-04	4.09-04
15	2.35-01	7.18-02	3.08-02	1.59-02	9.24-03	5.83-03	3.90-03	2.73-03	1.98-03	1.47-03	1.11-03	8.41-04	6.11-04	
14	2.85-01	8.73-02	3.74-02	1.93-02	1.12-02	7.06-03	4.72-03	3.29-03	2.38-03	1.75-03	1.30-03	9.28-04		
13	3.45-01	1.06-01	4.52-02	2.33-02	1.35-02	8.51-03	5.67-03	3.94-03	2.82-03	2.05-03	1.43-03			
12	4.11-01	1.26-01	5.38-02	2.77-02	1.61-02	1.01-02	6.69-03	4.62-03	3.25-03	2.22-03				
11	4.76-01	1.45-01	6.22-02	3.20-02	1.85-02	1.16-02	7.62-03	5.18-03	3.43-03					
10	5.31-01	1.62-01	6.93-02	3.56-02	2.05-02	1.27-02	8.26-03	5.28-03						
9	5.88-01	1.79-01	7.65-02	3.92-02	2.24-02	1.37-02	8.39-03							
8	6.82-01	2.08-01	8.86-02	4.52-02	2.55-02	1.47-02								
7	8.60-01	2.62-01	1.12-01	5.61-02	3.00-02									
6	1.19+00	3.63-01	1.53-01	7.36-02										
5	1.84+00	5.61-01	2.29-01											
4	3.44+00	1.00+00												
3	8.89+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.19-05	9.89-06	8.34-06	7.09-06	6.08-06	5.26-06	4.57-06	4.00-06	3.52-06	3.11-06	2.77-06	2.47-06	2.21-06	1.99-06
45	1.63-05	1.36-05	1.15-05	9.77-06	8.38-06	7.24-06	6.29-06	5.51-06	4.84-06	4.28-06	3.81-06	3.40-06	3.04-06	2.74-06
40	2.34-05	1.95-05	1.64-05	1.40-05	1.20-05	1.03-05	9.00-06	7.87-06	6.92-06	6.11-06	5.43-06	4.84-06	4.33-06	3.89-06
35	3.52-05	2.94-05	2.47-05	2.10-05	1.80-05	1.55-05	1.35-05	1.18-05	1.04-05	9.14-06	8.10-06	7.20-06	6.42-06	5.74-06
30	5.66-05	4.72-05	3.97-05	3.37-05	2.88-05	2.48-05	2.15-05	1.87-05	1.64-05	1.43-05	1.26-05	1.10-05	9.51-06	7.75-06
29	6.29-05	5.23-05	4.40-05	3.73-05	3.19-05	2.75-05	2.38-05	2.07-05	1.80-05	1.57-05	1.37-05	1.18-05	9.58-06	
28	7.01-05	5.83-05	4.90-05	4.16-05	3.55-05	3.05-05	2.64-05	2.29-05	1.99-05	1.72-05	1.47-05	1.19-05		
27	7.84-05	6.52-05	5.48-05	4.64-05	3.96-05	3.40-05	2.93-05	2.53-05	2.18-05	1.86-05	1.50-05			
26	8.81-05	7.32-05	6.15-05	5.20-05	4.43-05	3.79-05	3.26-05	2.79-05	2.37-05	1.90-05				
25	9.94-05	8.26-05	6.92-05	5.85-05	4.97-05	4.24-05	3.61-05	3.05-05	2.43-05					
24	1.13-04	9.35-05	7.83-05	6.60-05	5.59-05	4.73-05	3.96-05	3.14-05						
23	1.28-04	1.06-04	8.89-05	7.46-05	6.27-05	5.21-05	4.11-05							
22	1.47-04	1.22-04	1.01-04	8.42-05	6.96-05	5.44-05								
21	1.69-04	1.39-04	1.15-04	9.41-05	7.31-05									
20	1.95-04	1.59-04	1.29-04	9.97-05										
19	2.25-04	1.81-04	1.38-04											
18	2.58-04	1.95-04												
17	2.80-04													

HE + TE = 1.00+04 NE = 1.00+11 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.07-31	-2.90-38	-2.15-37	-6.82-37	-1.65-36	-3.36-36	-5.82-36	-8.25-36	-8.57-36	-4.55-36	4.55-36	1.84-35	3.66-35	5.91-35
45	1.47-31	-4.06-38	-3.00-37	-9.53-37	-2.32-36	-4.74-36	-8.28-36	-1.19-35	-1.26-35	-7.11-36	5.70-36	2.56-35	5.21-35	8.57-35
40	2.10-31	-5.93-38	-4.36-37	-1.39-36	-3.41-36	-7.03-36	-1.24-35	-1.80-35	-1.96-35	-1.20-35	6.84-36	3.70-35	7.83-35	1.32-34
35	3.14-31	-9.20-38	-6.72-37	-2.16-36	-5.33-36	-1.11-35	-1.99-35	-2.96-35	-3.33-35	-2.27-35	6.73-36	5.59-35	1.26-34	2.21-34
30	5.01-31	-1.55-37	-1.12-36	-3.62-36	-9.09-36	-1.93-35	-3.55-35	-5.45-35	-6.47-35	-5.02-35	-1.09-36	8.82-35	2.25-34	4.22-34
29	5.55-31	-1.74-37	-1.25-36	-4.07-36	-1.03-35	-2.19-35	-4.05-35	-6.27-35	-7.55-35	-6.05-35	-5.55-36	9.67-35	2.56-34	4.92-34
28	6.18-31	-1.96-37	-1.41-36	-4.60-36	-1.16-35	-2.50-35	-4.65-35	-7.27-35	-8.88-35	-7.37-35	-1.21-35	1.06-34	2.94-34	5.78-34
27	6.90-31	-2.22-37	-1.59-36	-5.22-36	-1.33-35	-2.87-35	-5.38-35	-8.51-35	-1.06-34	-9.08-35	-2.17-35	1.15-34	3.40-34	6.88-34
26	7.74-31	-2.54-37	-1.81-36	-5.96-36	-1.52-35	-3.32-35	-6.28-35	-1.00-34	-1.27-34	-1.13-34	-3.60-35	1.24-34	3.95-34	8.29-34
25	8.72-31	-2.91-37	-2.08-36	-6.85-36	-1.76-35	-3.87-35	-7.40-35	-1.20-34	-1.55-34	-1.44-34	-5.73-35	1.32-34	4.63-34	1.02-33
24	9.88-31	-3.37-37	-2.39-36	-7.94-36	-2.06-35	-4.56-35	-8.81-35	-1.45-34	-1.92-34	-1.86-34	-8.99-35	1.34-34	5.47-34	1.27-33
23	1.13-30	-3.92-37	-2.78-36	-9.27-36	-2.42-35	-5.42-35	-1.06-34	-1.78-34	-2.41-34	-2.45-34	-1.40-34	1.27-34	6.49-34	1.61-33
22	1.29-30	-4.60-37	-3.25-36	-1.09-35	-2.88-35	-6.52-35	-1.30-34	-2.22-34	-3.09-34	-3.31-34	-2.21-34	9.94-35	7.73-34	2.11-33
21	1.49-30	-5.45-37	-3.84-36	-1.30-35	-3.46-35	-7.95-35	-1.61-34	-2.81-34	-4.06-34	-4.99-34	-3.53-34	2.74-35	9.14-34	2.85-33
20	1.73-30	-6.49-37	-4.57-36	-1.56-35	-4.21-35	-9.83-35	-2.03-34	-3.65-34	-5.47-34	-6.57-34	-5.78-34	-1.35-34	1.06-33	4.06-33
19	2.02-30	-7.83-37	-5.51-36	-1.90-35	-5.20-35	-1.24-34	-2.61-34	-4.85-34	-7.60-34	-9.79-34	-9.87-34	-5.21-34	1.10-33	6.07-33
18	2.39-30	-9.52-37	-6.71-36	-2.34-35	-6.52-35	-1.58-34	-3.45-34	-6.65-34	-1.10-33	-1.53-33	-1.78-33	-1.46-33	6.48-34	9.77-33
17	2.86-30	-1.17-36	-8.26-36	-2.93-35	-8.32-35	-2.08-34	-4.68-34	-9.45-34	-1.67-33	-2.55-33	-3.46-33	-4.00-33	-2.16-33	1.69-32
16	3.45-30	-1.44-36	-1.03-35	-3.71-35	-1.08-34	-2.79-34	-6.56-34	-1.40-33	-2.68-33	-4.61-33	-7.51-33	-1.22-32	-1.96-32	8.87-33
15	4.22-30	-1.79-36	-1.29-35	-4.78-35	-1.43-34	-3.85-34	-9.56-34	-2.20-33	-4.66-33	-9.35-33	-1.95-32	-4.95-32	-2.37-31	
14	5.24-30	-2.20-36	-1.64-35	-6.21-35	-1.94-34	-5.48-34	-1.46-33	-3.71-33	-9.06-33	-2.27-32	-6.95-32	-4.29-31		
13	6.63-30	-2.65-36	-2.06-35	-8.12-35	-2.66-34	-8.05-34	-2.36-33	-6.88-33	-2.08-32	-7.53-32	-5.40-31			
12	8.57-30	-3.01-36	-2.56-35	-1.06-34	-3.69-34	-1.22-33	-4.09-33	-1.47-32	-6.42-32	-5.38-31				
11	1.14-29	-3.03-36	-3.03-35	-1.34-34	-5.10-34	-1.92-33	-7.91-33	-4.10-32	-4.13-31					
10	1.55-29	-2.28-36	-3.37-35	-1.63-34	-7.02-34	-3.22-33	-1.90-32	-2.27-31						
9	2.21-29	-3.88-37	-3.53-35	-1.96-34	-1.02-33	-6.56-33	-8.78-32							
8	3.32-29	3.06-36	-3.71-35	-2.59-34	-1.86-33	-2.67-32								
7	5.36-29	9.80-36	-4.16-35	-4.40-34	-6.93-33									
6	9.63-29	2.67-35	-4.60-35	-1.36-33										
5	2.96-28	8.69-35	3.29-35											
4	6.16-28	4.97-34												
3	4.47-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.64-35	1.19-34	1.58-34	2.05-34	2.61-34	3.28-34	4.09-34	5.07-34	6.26-34	7.70-34	9.46-34	1.16-33	1.43-33	1.76-33
45	1.27-34	1.77-34	2.39-34	3.14-34	4.07-34	5.22-34	6.64-34	8.40-34	1.06-33	1.34-33	1.69-33	2.15-33	2.74-33	3.51-33
40	2.00-34	2.85-34	3.93-34	5.29-34	7.02-34	9.27-34	1.22-33	1.59-33	2.09-33	2.76-33	3.67-33	4.92-33	6.69-33	9.25-33
35	3.46-34	5.12-34	7.31-34	1.02-33	1.42-33	1.97-33	2.74-33	3.82-33	5.41-33	7.79-33	1.15-32	1.75-32	2.77-32	4.65-32
30	7.04-34	1.11-33	1.69-33	2.56-33	3.88-33	5.98-33	9.41-33	1.53-32	2.64-32	4.88-32	1.01-31	2.51-31	8.69-31	6.67-30
29	8.35-34	1.34-33	2.09-33	3.24-33	5.06-33	8.08-33	1.33-32	2.30-32	4.29-32	8.93-32	2.23-31	7.73-31	5.97-30	
28	1.00-33	1.64-33	2.63-33	4.20-33	6.81-33	1.14-32	1.99-32	3.73-32	7.83-32	1.96-31	6.85-31	5.30-30		
27	1.22-33	2.06-33	3.40-33	5.64-33	9.55-33	1.70-32	3.22-32	6.80-32	1.72-31	6.01-31	4.68-30			
26	1.52-33	2.64-33	4.53-33	7.87-33	1.42-32	2.73-32	5.83-32	1.48-31	5.24-31	4.09-30				
25	1.93-33	3.50-33	6.29-33	1.16-32	2.27-32	4.93-32	1.27-31	4.51-31	3.55-30					
24	2.52-33	4.80-33	9.20-33	1.85-32	4.07-32	1.06-31	3.82-31	3.03-30						
23	3.41-33	6.94-33	1.45-32	3.28-32	8.71-32	3.19-31	2.56-30							
22	4.82-33	1.08-32	2.54-32	6.94-32	2.59-31	2.11-30								
21	7.27-33	1.85-32	5.29-32	2.03-31	1.70-30									
20	1.21-32	3.76-32	1.52-31	1.31-30										
19	2.31-32	1.03-31	9.47-31											
18	5.82-32	6.08-31												
17	2.93-31													

HE + TE = 1.00+04 NE = 1.00+12 CASE B NC = 20

TOTAL RC = 3.368-12 4-3 RC = 4.906-13 4-3 EM = 2.079-24 2S RC = 8.167-13 2P RC = 2.551-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.93-03	1.21-03	5.18-04	2.68-04	1.57-04	9.91-05	6.67-05	4.70-05	3.44-05	2.59-05	2.00-05	1.57-05	1.26-05	1.03-05
45	5.42-03	1.66-03	7.15-04	3.70-04	2.16-04	1.37-04	9.20-05	6.48-05	4.74-05	3.57-05	2.75-05	2.17-05	1.74-05	1.41-05
40	7.78-03	2.39-03	1.03-03	5.31-04	3.10-04	1.96-04	1.32-04	9.30-05	6.80-05	5.12-05	3.95-05	3.11-05	2.49-05	2.03-05
35	1.18-02	3.61-03	1.55-03	8.02-04	4.68-04	2.96-04	1.99-04	1.40-04	1.03-04	7.72-05	5.95-05	4.69-05	3.76-05	3.05-05
30	1.90-02	5.83-03	2.50-03	1.30-03	7.56-04	4.78-04	3.22-04	2.27-04	1.66-04	1.25-04	9.60-05	7.56-05	6.05-05	4.92-05
29	2.11-02	6.48-03	2.79-03	1.44-03	8.41-04	5.32-04	3.58-04	2.52-04	1.84-04	1.38-04	1.07-04	8.40-05	6.72-05	5.46-05
28	2.36-02	7.24-03	3.11-03	1.61-03	9.39-04	5.94-04	3.99-04	2.81-04	2.05-04	1.55-04	1.19-04	9.37-05	7.50-05	6.09-05
27	2.65-02	8.12-03	3.49-03	1.81-03	1.05-03	6.66-04	4.48-04	3.15-04	2.30-04	1.73-04	1.33-04	1.05-04	8.40-05	6.82-05
26	2.99-02	9.16-03	3.93-03	2.04-03	1.19-03	7.51-04	5.05-04	3.55-04	2.59-04	1.95-04	1.50-04	1.18-04	9.45-05	7.67-05
25	3.38-02	1.04-02	4.45-03	2.31-03	1.34-03	8.50-04	5.71-04	4.02-04	2.94-04	2.21-04	1.70-04	1.34-04	1.07-04	8.67-05
24	3.86-02	1.18-02	5.08-03	2.63-03	1.53-03	9.68-04	6.51-04	4.58-04	3.34-04	2.51-04	1.93-04	1.52-04	1.22-04	9.86-05
23	4.42-02	1.36-02	5.82-03	3.01-03	1.75-03	1.11-03	7.46-04	5.25-04	3.83-04	2.88-04	2.21-04	1.74-04	1.39-04	1.13-04
22	5.10-02	1.56-02	6.72-03	3.48-03	2.02-03	1.28-03	8.60-04	6.05-04	4.41-04	3.32-04	2.55-04	2.00-04	1.60-04	1.29-04
21	5.94-02	1.82-02	7.81-03	4.04-03	2.35-03	1.49-03	1.00-03	7.03-04	5.13-04	3.85-04	2.96-04	2.32-04	1.85-04	1.50-04
20	6.97-02	2.13-02	9.16-03	4.74-03	2.76-03	1.74-03	1.17-03	8.23-04	6.00-04	4.50-04	3.46-04	2.71-04	2.16-04	1.74-04
19	8.25-02	2.53-02	1.08-02	5.61-03	3.27-03	2.06-03	1.39-03	9.73-04	7.09-04	5.31-04	4.08-04	3.19-04	2.53-04	2.03-04
18	9.88-02	3.03-02	1.30-02	6.71-03	3.91-03	2.47-03	1.65-03	1.16-03	8.46-04	6.33-04	4.85-04	3.79-04	3.00-04	2.39-04
17	1.20-01	3.66-02	1.57-02	8.12-03	4.72-03	2.98-03	2.00-03	1.40-03	1.02-03	7.63-04	5.83-04	4.53-04	3.56-04	2.79-04
16	1.47-01	4.49-02	1.93-02	9.96-03	5.79-03	3.65-03	2.45-03	1.71-03	1.24-03	9.28-04	7.07-04	5.45-04	4.21-04	3.10-04
15	1.83-01	5.60-02	2.40-02	1.24-02	7.20-03	4.54-03	3.04-03	2.12-03	1.54-03	1.14-03	8.64-04	6.55-04	4.75-04	
14	2.31-01	7.08-02	3.03-02	1.57-02	9.09-03	5.72-03	3.82-03	2.67-03	1.92-03	1.42-03	1.05-03	7.52-04		
13	2.98-01	9.11-02	3.90-02	2.01-02	1.17-02	7.34-03	4.89-03	3.40-03	2.43-03	1.76-03	1.23-03			
12	3.90-01	1.19-01	5.10-02	2.63-02	1.52-02	9.55-03	6.34-03	4.37-03	3.08-03	2.10-03				
11	5.18-01	1.58-01	6.75-02	3.47-02	2.01-02	1.25-02	8.26-03	5.60-03	3.71-03					
10	6.87-01	2.10-01	8.94-02	4.59-02	2.64-02	1.64-02	1.06-02	6.76-03						
9	8.87-01	2.70-01	1.15-01	5.88-02	3.36-02	2.05-02	1.25-02							
8	1.07+00	3.25-01	1.38-01	7.06-02	3.93-02	2.25-02								
7	1.21+00	3.66-01	1.54-01	7.69-02	4.07-02									
6	1.44+00	4.34-01	1.80-01	8.49-02										
5	2.03+00	6.04-01	2.37-01											
4	3.57+00	1.00+00												
3	8.88+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.47-06	7.06-06	5.95-06	5.06-06	4.34-06	3.75-06	3.26-06	2.86-06	2.51-06	2.22-06	1.98-06	1.76-06	1.58-06	1.42-06
45	1.17-05	9.73-06	8.20-06	6.98-06	5.98-06	5.17-06	4.49-06	3.93-06	3.46-06	3.06-06	2.72-06	2.43-06	2.17-06	1.95-06
40	1.67-05	1.39-05	1.17-05	9.99-06	8.56-06	7.39-06	6.43-06	5.62-06	4.94-06	4.37-06	3.88-06	3.46-06	3.09-06	2.78-06
35	2.52-05	2.10-05	1.77-05	1.50-05	1.29-05	1.11-05	9.64-06	8.42-06	7.40-06	6.53-06	5.78-06	5.14-06	4.59-06	4.10-06
30	4.05-05	3.37-05	2.84-05	2.41-05	2.06-05	1.77-05	1.54-05	1.34-05	1.17-05	1.03-05	9.00-06	7.88-06	6.80-06	5.54-06
29	4.50-05	3.74-05	3.15-05	2.67-05	2.28-05	1.97-05	1.70-05	1.48-05	1.29-05	1.13-05	9.81-06	8.43-06	6.85-06	
28	5.01-05	4.17-05	3.51-05	2.97-05	2.54-05	2.18-05	1.89-05	1.64-05	1.42-05	1.23-05	1.06-05	8.53-06		
27	5.61-05	4.67-05	3.92-05	3.32-05	2.84-05	2.43-05	2.10-05	1.81-05	1.56-05	1.33-05	1.07-05			
26	6.31-05	5.25-05	4.40-05	3.73-05	3.18-05	2.72-05	2.33-05	2.00-05	1.70-05	1.36-05				
25	7.13-05	5.92-05	4.97-05	4.20-05	3.57-05	3.04-05	2.59-05	2.18-05	1.74-05					
24	8.09-05	6.72-05	5.62-05	4.74-05	4.01-05	3.40-05	2.84-05	2.26-05						
23	9.24-05	7.65-05	6.39-05	5.37-05	4.51-05	3.75-05	2.96-05							
22	1.06-04	8.76-05	7.29-05	6.07-05	5.01-05	3.92-05								
21	1.22-04	1.01-04	8.31-05	6.80-05	5.28-05									
20	1.42-04	1.16-04	9.39-05	7.23-05										
19	1.64-04	1.32-04	1.01-04											
18	1.90-04	1.43-04												
17	2.08-04													

HE + TE = 1.00+04 NE = 1.00+12 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.49-31	-2.57-38	-1.70-37	-4.90-37	-9.44-37	-8.35-37	1.63-36	7.57-36	1.64-35	2.75-35	4.09-35	5.68-35	7.57-35	9.84-35
45	2.05-31	-3.60-38	-2.37-37	-6.87-37	-1.33-36	-1.22-36	2.20-36	1.05-35	2.30-35	3.90-35	5.84-35	8.19-35	1.10-34	1.45-34
40	2.93-31	-5.28-38	-3.46-37	-1.01-36	-1.98-36	-1.88-36	3.03-36	1.53-35	3.39-35	5.81-35	8.82-35	1.25-34	1.71-34	2.28-34
35	4.39-31	-8.22-38	-5.35-37	-1.57-36	-3.15-36	-3.15-36	4.27-36	2.34-35	5.32-35	9.30-35	1.44-34	2.08-34	2.90-34	3.96-34
30	7.00-31	-1.39-37	-8.98-37	-2.68-36	-5.48-36	-5.93-36	6.03-36	3.85-35	9.14-35	1.65-34	2.62-34	3.92-34	5.68-34	8.07-34
29	7.75-31	-1.57-37	-1.01-36	-3.02-36	-6.22-36	-6.85-36	6.43-36	4.30-35	1.03-34	1.88-34	3.01-34	4.55-34	6.65-34	9.58-34
28	8.63-31	-1.77-37	-1.14-36	-3.42-36	-7.10-36	-7.98-36	6.82-36	4.83-35	1.17-34	2.15-34	3.49-34	5.33-34	7.89-34	1.15-33
27	9.64-31	-2.01-37	-1.29-36	-3.90-36	-8.15-36	-9.37-36	7.18-36	5.45-35	1.34-34	2.49-34	4.09-34	6.31-34	9.48-34	1.41-33
26	1.08-30	-2.31-37	-1.47-36	-4.47-36	-9.44-36	-1.11-35	7.47-36	6.18-35	1.55-34	2.91-34	4.83-34	7.57-34	1.16-33	1.75-33
25	1.22-30	-2.66-37	-1.69-36	-5.17-36	-1.10-35	-1.33-35	7.62-36	7.05-35	1.80-34	3.43-34	5.78-34	9.22-34	1.43-33	2.22-33
24	1.38-30	-3.09-37	-1.96-36	-6.02-36	-1.30-35	-1.61-35	7.53-36	8.08-35	2.11-34	4.09-34	7.02-34	1.14-33	1.82-33	2.89-33
23	1.57-30	-3.61-37	-2.29-36	-7.08-36	-1.54-35	-1.98-35	7.03-36	9.32-35	2.50-34	4.95-34	8.67-34	1.44-33	2.36-33	3.90-33
22	1.80-30	-4.27-37	-2.70-36	-8.41-36	-1.86-35	-2.46-35	5.82-36	1.08-34	3.00-34	6.08-34	1.09-33	1.87-33	3.18-33	5.48-33
21	2.08-30	-5.10-37	-3.21-36	-1.01-35	-2.27-35	-3.12-35	3.43-36	1.27-34	3.65-34	7.61-34	1.41-33	2.50-33	4.45-33	8.14-33
20	2.41-30	-6.15-37	-3.87-36	-1.23-35	-2.81-35	-4.02-35	-8.93-37	1.49-34	4.51-34	9.75-34	1.88-33	3.49-33	6.58-33	1.31-32
19	2.82-30	-7.53-37	-4.72-36	-1.52-35	-3.55-35	-5.29-35	-8.80-36	1.76-34	5.69-34	1.29-33	2.60-33	5.13-33	1.05-32	2.34-32
18	3.34-30	-9.34-37	-5.85-36	-1.91-35	-4.57-35	-7.16-35	-2.30-35	2.09-34	7.33-34	1.75-33	3.78-33	8.12-33	1.87-32	5.02-32
17	3.99-30	-1.18-36	-7.37-36	-2.45-35	-6.02-35	-9.97-35	-4.88-35	2.47-34	9.71-34	2.51-33	5.90-33	1.43-32	3.97-32	1.49-31
16	4.81-30	-1.51-36	-9.48-36	-3.21-35	-8.16-35	-1.44-34	-9.70-35	2.87-34	1.33-33	3.83-33	1.02-32	2.99-32	1.16-31	9.76-31
15	5.89-30	-1.99-36	-1.25-35	-4.33-35	-1.14-34	-2.16-34	-1.91-34	3.11-34	1.91-33	6.40-33	2.09-32	8.60-32	7.48-31	
14	7.32-30	-2.66-36	-1.68-35	-6.03-35	-1.67-34	-3.43-34	-3.86-34	2.63-34	2.89-33	1.24-32	5.78-32	5.37-31		
13	9.26-30	-3.65-36	-2.33-35	-8.70-35	-2.56-34	-5.81-34	-8.27-34	-7.98-35	4.67-33	3.15-32	3.40-31			
12	1.20-29	-5.13-36	-3.34-35	-1.31-34	-4.17-34	-1.07-33	-1.95-33	-1.71-33	7.83-33	1.58-31				
11	1.59-29	-7.31-36	-4.93-35	-2.07-34	-7.28-34	-2.20-33	-5.43-33	-1.10-32	-1.67-33					
10	2.17-29	-1.04-35	-7.43-35	-3.41-34	-1.39-33	-5.31-33	-2.03-32	-1.20-31						
9	3.09-29	-1.40-35	-1.11-34	-5.83-34	-2.95-33	-1.67-32	-1.57-31							
8	4.63-29	-1.59-35	-1.56-34	-1.01-33	-7.41-33	-1.00-31								
7	7.48-29	-1.24-35	-1.99-34	-1.87-33	-3.21-32									
6	1.34-28	-2.28-38	-2.78-34	-6.15-33										
5	2.88-28	4.23-35	-6.55-34											
4	8.60-28	3.84-34												
3	6.24-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.26-34	1.58-34	1.97-34	2.44-34	3.01-34	3.69-34	4.51-34	5.51-34	6.71-34	8.18-34	9.97-34	1.22-33	1.49-33	1.83-33
45	1.87-34	2.38-34	3.01-34	3.78-34	4.73-34	5.91-34	7.36-34	9.18-34	1.14-33	1.43-33	1.79-33	2.26-33	2.86-33	3.65-33
40	2.99-34	3.88-34	5.00-34	6.43-34	8.24-34	1.06-33	1.36-33	1.75-33	2.27-33	2.97-33	3.91-33	5.21-33	7.04-33	9.68-33
35	5.33-34	7.13-34	9.50-34	1.27-33	1.69-33	2.28-33	3.10-33	4.26-33	5.94-33	8.47-33	1.24-32	1.87-32	2.94-32	4.91-32
30	1.14-33	1.61-33	2.28-33	3.27-33	4.76-33	7.11-33	1.09-32	1.75-32	2.96-32	5.41-32	1.11-31	2.73-31	9.38-31	7.17-30
29	1.37-33	1.97-33	2.84-33	4.17-33	6.25-33	9.67-33	1.55-32	2.64-32	4.64-32	9.96-32	2.46-31	8.46-31	6.47-30	
28	1.67-33	2.45-33	3.62-33	5.47-33	8.50-33	1.37-32	2.34-32	4.31-32	8.90-32	2.20-31	7.61-31	5.83-30		
27	2.08-33	3.12-33	4.75-33	7.43-33	1.21-32	2.07-32	3.83-32	7.92-32	1.97-31	6.81-31	5.24-30			
26	2.65-33	4.08-33	6.43-33	1.05-32	1.81-32	3.37-32	7.01-32	1.75-31	6.06-31	4.67-30				
25	3.46-33	5.52-33	9.10-33	1.58-32	2.95-32	6.17-32	1.54-31	5.38-31	4.16-30					
24	4.68-33	7.80-33	1.36-32	2.57-32	5.39-32	1.36-31	4.74-31	3.68-30						
23	6.59-33	1.17-32	2.21-32	4.67-32	1.18-31	4.15-31	3.23-30							
22	9.82-33	1.88-32	4.01-32	1.02-31	3.60-31	2.82-30								
21	1.58-32	3.41-32	8.74-32	3.11-31	2.45-30									
20	2.86-32	7.40-32	2.65-31	2.10-30										
19	6.16-32	2.23-31	1.78-30											
18	1.85-31	1.49-30												
17	1.22-30													

HE + TE = 1.00+04 NE = 1.00+13 CASE B NC = 20

TOTAL RC = 5.813-12 4-3 RC = 9.215-13 4-3 EM = 3.905-24 2S RC = 1.246-12 2P RC = 4.567-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.09-03	6.42-04	2.76-04	1.43-04	8.33-05	5.28-05	3.55-05	2.50-05	1.83-05	1.38-05	1.06-05	8.38-06	6.72-06	5.47-06
45	2.89-03	8.85-04	3.81-04	1.97-04	1.15-04	7.28-05	4.90-05	3.45-05	2.52-05	1.90-05	1.47-05	1.15-05	9.26-06	7.53-06
40	4.14-03	1.27-03	5.46-04	2.83-04	1.65-04	1.04-04	7.03-05	4.95-05	3.62-05	2.73-05	2.10-05	1.66-05	1.33-05	1.08-05
35	6.26-03	1.92-03	8.25-04	4.27-04	2.49-04	1.58-04	1.06-04	7.47-05	5.46-05	4.11-05	3.17-05	2.50-05	2.00-05	1.63-05
30	1.01-02	3.10-03	1.33-03	6.90-04	4.03-04	2.55-04	1.71-04	1.21-04	8.82-05	6.63-05	5.11-05	4.02-05	3.22-05	2.62-05
29	1.13-02	3.45-03	1.48-03	7.68-04	4.48-04	2.83-04	1.91-04	1.34-04	9.80-05	7.37-05	5.68-05	4.47-05	3.58-05	2.91-05
28	1.26-02	3.86-03	1.66-03	8.58-04	5.00-04	3.16-04	2.13-04	1.50-04	1.09-04	8.23-05	6.34-05	4.99-05	3.99-05	3.25-05
27	1.41-02	4.33-03	1.86-03	9.62-04	5.61-04	3.55-04	2.39-04	1.68-04	1.23-04	9.23-05	7.11-05	5.59-05	4.47-05	3.63-05
26	1.59-02	4.88-03	2.10-03	1.08-03	6.32-04	4.00-04	2.69-04	1.89-04	1.38-04	1.04-04	8.01-05	6.30-05	5.04-05	4.09-05
25	1.80-02	5.53-03	2.37-03	1.23-03	7.16-04	4.53-04	3.05-04	2.14-04	1.56-04	1.18-04	9.06-05	7.12-05	5.70-05	4.62-05
24	2.05-02	6.30-03	2.71-03	1.40-03	8.16-04	5.16-04	3.47-04	2.44-04	1.78-04	1.34-04	1.03-04	8.10-05	6.48-05	5.25-05
23	2.36-02	7.23-03	3.10-03	1.61-03	9.35-04	5.92-04	3.98-04	2.80-04	2.04-04	1.53-04	1.18-04	9.27-05	7.41-05	6.00-05
22	2.72-02	8.35-03	3.58-03	1.85-03	1.08-03	6.83-04	4.59-04	3.23-04	2.35-04	1.77-04	1.36-04	1.07-04	8.52-05	6.90-05
21	3.17-02	9.72-03	4.17-03	2.16-03	1.26-03	7.95-04	5.34-04	3.75-04	2.74-04	2.05-04	1.58-04	1.24-04	9.88-05	7.98-05
20	3.72-02	1.14-02	4.89-03	2.53-03	1.47-03	9.32-04	6.26-04	4.40-04	3.21-04	2.41-04	1.85-04	1.45-04	1.15-04	9.29-05
19	4.41-02	1.35-02	5.80-03	3.00-03	1.75-03	1.10-03	7.41-04	5.20-04	3.79-04	2.84-04	2.18-04	1.71-04	1.35-04	1.09-04
18	5.29-02	1.62-02	6.95-03	3.59-03	2.09-03	1.32-03	8.86-04	6.22-04	4.53-04	3.39-04	2.60-04	2.03-04	1.60-04	1.28-04
17	6.42-02	1.97-02	8.44-03	4.36-03	2.54-03	1.60-03	1.07-03	7.53-04	5.48-04	4.09-04	3.13-04	2.43-04	1.91-04	1.50-04
16	7.91-02	2.42-02	1.04-02	5.37-03	3.12-03	1.97-03	1.32-03	9.24-04	6.71-04	5.00-04	3.81-04	2.94-04	2.27-04	1.67-04
15	9.91-02	3.03-02	1.30-02	6.71-03	3.90-03	2.46-03	1.65-03	1.15-03	8.34-04	6.20-04	4.68-04	3.55-04	2.58-04	
14	1.27-01	3.87-02	1.66-02	8.57-03	4.97-03	3.13-03	2.09-03	1.46-03	1.05-03	7.77-04	5.77-04	4.11-04		
13	1.66-01	5.07-02	2.17-02	1.12-02	6.48-03	4.08-03	2.72-03	1.89-03	1.35-03	9.80-04	6.85-04			
12	2.23-01	6.81-02	2.91-02	1.50-02	8.68-03	5.45-03	3.61-03	2.49-03	1.75-03	1.20-03				
11	3.09-01	9.45-02	4.04-02	2.08-02	1.20-02	7.49-03	4.93-03	3.34-03	2.21-03					
10	4.46-01	1.36-01	5.80-02	2.98-02	1.71-02	1.06-02	6.87-03	4.38-03						
9	6.68-01	2.03-01	8.65-02	4.42-02	2.52-02	1.54-02	9.36-03							
8	1.03+00	3.12-01	1.32-01	6.71-02	3.76-02	2.16-02								
7	1.55+00	4.70-01	1.98-01	9.84-02	5.19-02									
6	2.06+00	6.18-01	2.55-01	1.20-01										
5	2.44+00	7.20-01	2.80-01											
4	3.60+00	1.00+00												
3	8.32+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.51-06	3.76-06	3.17-06	2.70-06	2.31-06	2.00-06	1.74-06	1.52-06	1.34-06	1.18-06	1.05-06	9.40-07	8.42-07	7.58-07
45	6.21-06	5.18-06	4.37-06	3.71-06	3.18-06	2.75-06	2.39-06	2.09-06	1.84-06	1.63-06	1.45-06	1.29-06	1.16-06	1.04-06
40	8.90-06	7.42-06	6.25-06	5.32-06	4.56-06	3.94-06	3.42-06	2.99-06	2.63-06	2.33-06	2.06-06	1.84-06	1.65-06	1.48-06
35	1.34-05	1.12-05	9.41-06	8.00-06	6.85-06	5.91-06	5.13-06	4.49-06	3.94-06	3.48-06	3.08-06	2.74-06	2.44-06	2.18-06
30	2.16-05	1.80-05	1.51-05	1.28-05	1.10-05	9.45-06	8.19-06	7.13-06	6.23-06	5.46-06	4.79-06	4.19-06	3.62-06	2.95-06
29	2.40-05	1.99-05	1.68-05	1.42-05	1.22-05	1.05-05	9.06-06	7.88-06	6.87-06	6.00-06	5.23-06	4.49-06	3.65-06	
28	2.67-05	2.22-05	1.87-05	1.58-05	1.35-05	1.16-05	1.01-05	8.72-06	7.57-06	6.57-06	5.62-06	4.55-06		
27	2.99-05	2.49-05	2.09-05	1.77-05	1.51-05	1.30-05	1.12-05	9.66-06	8.33-06	7.09-06	5.71-06			
26	3.36-05	2.80-05	2.35-05	1.99-05	1.69-05	1.45-05	1.24-05	1.07-05	9.04-06	7.24-06				
25	3.80-05	3.16-05	2.65-05	2.24-05	1.90-05	1.62-05	1.38-05	1.16-05	9.28-06					
24	4.31-05	3.58-05	3.00-05	2.53-05	2.14-05	1.81-05	1.52-05	1.20-05						
23	4.92-05	4.08-05	3.41-05	2.86-05	2.40-05	2.00-05	1.58-05							
22	5.65-05	4.67-05	3.89-05	3.24-05	2.67-05	2.09-05								
21	6.52-05	5.37-05	4.43-05	3.63-05	2.82-05									
20	7.56-05	6.18-05	5.01-05	3.86-05										
19	8.79-05	7.06-05	5.39-05											
18	1.02-04	7.67-05												
17	1.12-04													

HE + TE = 1.00+04 NE = 1.00+13 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.54-31	2.26-39	-1.99-38	2.29-37	2.04-36	6.54-36	1.27-35	2.00-35	2.86-35	3.90-35	5.14-35	6.66-35	8.49-35	1.07-34
45	3.49-31	2.46-39	-3.02-38	3.08-37	2.81-36	9.08-36	1.78-35	2.81-35	4.05-35	5.55-35	7.38-35	9.62-35	1.24-34	1.58-34
40	4.98-31	2.21-39	-4.90-38	4.27-37	4.03-36	1.32-35	2.60-35	4.15-35	6.02-35	8.32-35	1.12-34	1.48-34	1.93-34	2.49-34
35	7.45-31	4.42-40	-8.67-38	6.09-37	6.08-36	2.02-35	4.03-35	6.51-35	9.57-35	1.34-34	1.84-34	2.47-34	3.28-34	4.34-34
30	1.19-30	-6.52-39	-1.72-37	8.94-37	9.82-36	3.34-35	6.79-35	1.12-34	1.68-34	2.41-34	3.39-34	4.70-34	6.48-34	8.92-34
29	1.32-30	-9.38-39	-2.01-37	9.67-37	1.09-35	3.74-35	7.64-35	1.26-34	1.91-34	2.76-34	3.91-34	5.47-34	7.61-34	1.06-33
28	1.47-30	-1.31-38	-2.36-37	1.05-36	1.22-35	4.20-35	8.64-35	1.44-34	2.19-34	3.19-34	4.55-34	6.42-34	9.05-34	1.28-33
27	1.64-30	-1.80-38	-2.80-37	1.13-36	1.36-35	4.75-35	9.83-35	1.65-34	2.52-34	3.71-34	5.35-34	7.64-34	1.09-33	1.56-33
26	1.84-30	-2.45-38	-3.34-37	1.22-36	1.54-35	5.40-35	1.13-34	1.90-34	2.94-34	4.36-34	6.35-34	9.20-34	1.33-33	1.95-33
25	2.07-30	-3.30-38	-4.03-37	1.31-36	1.74-35	6.18-35	1.30-34	2.21-34	3.45-34	5.18-34	7.65-34	1.12-33	1.66-33	2.48-33
24	2.34-30	-4.44-38	-4.91-37	1.40-36	1.98-35	7.12-35	1.51-34	2.60-34	4.10-34	6.23-34	9.47-34	1.48-33	2.12-33	3.25-33
23	2.67-30	-5.98-38	-6.04-37	1.48-36	2.26-35	8.26-35	1.77-34	3.09-34	4.93-34	7.62-34	1.16-33	1.78-33	2.77-33	4.41-33
22	3.06-30	-8.06-38	-7.52-37	1.54-36	2.61-35	9.68-35	2.10-34	3.71-34	6.02-34	9.47-34	1.48-33	2.33-33	3.74-33	6.23-33
21	3.53-30	-1.09-37	-9.49-37	1.56-36	3.02-35	1.14-34	2.53-34	4.53-34	7.48-34	1.20-33	1.93-33	3.15-33	5.29-33	9.32-33
20	4.10-30	-1.49-37	-1.21-36	1.51-36	3.53-35	1.37-34	3.08-34	5.62-34	9.50-34	1.57-33	2.61-33	4.44-33	7.90-33	1.51-32
19	4.80-30	-2.06-37	-1.58-36	1.34-36	4.16-35	1.66-34	3.81-34	7.12-34	1.24-33	2.12-33	3.67-33	6.62-33	1.28-32	2.74-32
18	5.67-30	-2.87-37	-2.09-36	9.44-37	4.94-35	2.05-34	4.81-34	9.25-34	1.66-33	2.97-33	5.46-33	1.07-32	2.31-32	5.96-32
17	6.77-30	-4.07-37	-2.84-36	1.49-37	5.92-35	2.56-34	6.23-34	1.24-33	2.33-33	4.41-33	8.78-33	1.93-32	5.01-32	1.80-31
16	8.18-30	-5.86-37	-3.94-36	-1.36-36	7.16-35	3.28-34	8.30-34	1.73-33	3.45-33	7.06-33	1.58-32	4.16-32	1.51-31	1.21-30
15	1.00-29	-8.62-37	-5.62-36	-4.21-36	8.73-35	4.31-34	1.15-33	2.54-33	5.49-33	1.26-32	3.39-32	1.25-31	1.01-30	
14	1.24-29	-1.30-36	-8.29-36	-9.60-36	1.07-34	5.85-34	1.67-33	4.02-33	9.76-33	2.70-32	1.01-31	8.27-31		
13	1.57-29	-2.02-36	-1.27-35	-2.01-35	1.30-34	8.26-34	2.60-33	7.07-33	2.06-32	7.97-32	6.64-31			
12	2.03-29	-3.27-36	-2.05-35	-4.17-35	1.52-34	1.23-33	4.46-33	1.47-32	6.01-32	5.17-31				
11	2.69-29	-5.49-36	-3.49-35	-8.84-35	1.54-34	1.96-33	8.94-33	4.17-32	3.81-31					
10	3.68-29	-9.68-36	-6.37-35	-1.99-34	4.76-35	3.46-33	2.38-32	2.53-31						
9	5.24-29	-1.79-35	-1.26-34	-4.94-34	-5.93-34	6.92-33	1.28-31							
8	7.87-29	-3.45-35	-2.72-34	-1.42-33	-4.61-33	1.27-32								
7	1.27-28	-6.48-35	-6.33-34	-5.10-33	-5.14-32									
6	2.28-28	-9.76-35	-1.49-33	-2.99-32										
5	4.88-28	-8.29-35	-4.49-33											
4	1.46-27	2.40-34												
3	1.06-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.34-34	1.66-34	2.05-34	2.52-34	3.09-34	3.77-34	4.60-34	5.59-34	6.80-34	8.27-34	1.01-33	1.23-33	1.50-33	1.84-33
45	1.99-34	2.51-34	3.14-34	3.91-34	4.86-34	6.04-34	7.50-34	9.32-34	1.16-33	1.45-33	1.81-33	2.28-33	2.89-33	3.68-33
40	3.20-34	4.09-34	5.22-34	6.65-34	8.48-34	1.08-33	1.39-33	1.78-33	2.31-33	3.00-33	3.95-33	5.26-33	7.10-33	9.76-33
35	5.73-34	7.54-34	9.95-34	1.32-33	1.75-33	2.34-33	3.17-33	4.34-33	6.05-33	8.59-33	1.25-32	1.89-32	2.97-32	4.96-32
30	1.23-33	1.71-33	2.40-33	3.41-33	4.94-33	7.32-33	1.12-32	1.79-32	3.02-32	5.51-32	1.13-31	2.77-31	9.51-31	7.25-30
29	1.48-33	2.09-33	2.99-33	4.36-33	6.49-33	9.98-33	1.60-32	2.70-32	4.95-32	1.02-31	2.50-31	8.60-31	6.57-30	
28	1.82-33	2.61-33	3.82-33	5.72-33	8.83-33	1.42-32	2.41-32	4.43-32	9.11-32	2.25-31	7.75-31	5.93-30		
27	2.27-33	3.34-33	5.02-33	7.78-33	1.26-32	2.14-32	3.94-32	8.14-32	2.02-31	6.96-31	5.34-30			
26	2.89-33	4.38-33	6.82-33	1.11-32	1.89-32	3.50-32	7.24-32	1.80-31	6.22-31	4.78-30				
25	3.79-33	5.94-33	9.68-33	1.66-32	3.09-32	6.42-32	1.60-31	5.55-31	4.28-30					
24	5.14-33	8.42-33	1.45-32	2.71-32	5.65-32	1.41-31	4.92-31	3.80-30						
23	7.27-33	1.26-32	2.37-32	4.95-32	1.24-31	4.34-31	3.37-30							
22	1.09-32	2.05-32	4.32-32	1.09-31	3.81-31	2.97-30								
21	1.77-32	3.74-32	9.45-32	3.33-31	2.60-30									
20	3.21-32	8.17-32	2.89-31	2.26-30										
19	7.01-32	2.49-31	1.96-30											
18	2.13-31	1.68-30												
17	1.43-30													

HE + TE = 1.25+04 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 1.295-12 4-3 RC = 2.823-13 4-3 EM = 1.196-24 2S RC = 3.572-13 2P RC = 9.375-13

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.53-04	3.62-04	1.93-04	1.18-04	7.91-05	5.57-05	4.08-05	3.09-05	2.39-05	1.89-05	1.52-05	1.24-05	1.03-05	8.57-06
45	1.28-03	4.87-04	2.61-04	1.61-04	1.08-04	7.62-05	5.60-05	4.24-05	3.29-05	2.60-05	2.10-05	1.71-05	1.42-05	1.18-05
40	1.79-03	6.85-04	3.68-04	2.28-04	1.53-04	1.08-04	7.97-05	6.04-05	4.69-05	3.72-05	3.00-05	2.45-05	2.03-05	1.69-05
35	2.63-03	1.01-03	5.46-04	3.39-04	2.28-04	1.62-04	1.19-04	9.04-05	7.03-05	5.57-05	4.49-05	3.67-05	3.04-05	2.54-05
30	4.14-03	1.60-03	8.62-04	5.36-04	3.61-04	2.57-04	1.89-04	1.44-04	1.12-04	8.90-05	7.18-05	5.88-05	4.87-05	4.08-05
29	4.57-03	1.76-03	9.53-04	5.93-04	4.00-04	2.84-04	2.10-04	1.60-04	1.24-04	9.87-05	7.97-05	6.52-05	5 40-05	4.52-05
28	5.07-03	1.96-03	1.06-03	6.59-04	4.44-04	3.16-04	2.33-04	1.78-04	1.38-04	1.10-04	8.87-05	7.26-05	6.02-05	5.04-05
27	5.64-03	2.18-03	1.18-03	7.34-04	4.95-04	3.53-04	2.61-04	1.98-04	1.55-04	1.23-04	9.92-05	8.12-05	6.73-05	5.63-05
26	6.30-03	2.43-03	1.32-03	8.22-04	5.55-04	3.95-04	2.92-04	2.23-04	1.73-04	1.38-04	1.11-04	9.12-05	7.56-05	6.33-05
25	7.07-03	2.73-03	1.48-03	9.24-04	6.25-04	4.45-04	3.29-04	2.51-04	1.96-04	1.56-04	1.26-04	1.03-04	8.53-05	7.14-05
24	7.97-03	3.08-03	1.67-03	1.04-03	7.06-04	5.03-04	3.73-04	2.84-04	2.22-04	1.76-04	1.43-04	1.17-04	9.68-05	8.10-05
23	9.03-03	3.50-03	1.90-03	1.19-03	8.03-04	5.73-04	4.25-04	3.24-04	2.53-04	2.01-04	1.63-04	1.33-04	1.10-04	9.24-05
22	1.03-02	3.99-03	2.17-03	1.36-03	9.19-04	6.56-04	4.86-04	3.71-04	2.90-04	2.31-04	1.87-04	1.53-04	1.27-04	1.06-04
21	1.18-02	4.57-03	2.49-03	1.56-03	1.06-03	7.56-04	5.61-04	4.29-04	3.35-04	2.67-04	2.16-04	1.77-04	1.47-04	1.22-04
20	1.36-02	5.28-03	2.88-03	1.81-03	1.23-03	8.78-04	6.52-04	4.99-04	3.90-04	3.11-04	2.52-04	2.06-04	1.71-04	1.42-04
19	1.58-02	6.15-03	3.35-03	2.11-03	1.43-03	1.03-03	7.64-04	5.85-04	4.58-04	3.65-04	2.96-04	2.42-04	2.00-04	1.66-04
18	1.85-02	7.22-03	3.94-03	2.48-03	1.69-03	1.21-03	9.04-04	6.93-04	5.43-04	4.33-04	3.51-04	2.87-04	2.36-04	1.93-04
17	2.19-02	8.55-03	4.68-03	2.95-03	2.02-03	1.45-03	1.08-03	8.30-04	6.51-04	5.19-04	4.20-04	3.42-04	2.79-04	2.23-04
16	2.62-02	1.02-02	5.62-03	3.55-03	2.43-03	1.75-03	1.31-03	1.01-03	7.90-04	6.30-04	5.08-04	4.11-04	3.27-04	2.40-04
15	3.17-02	1.24-02	6.83-03	4.33-03	2.97-03	2.15-03	1.61-03	1.24-03	9.71-04	7.74-04	6.20-04	4.90-04	3.58-04	
14	3.88-02	1.52-02	8.42-03	5.36-03	3.69-03	2.67-03	2.00-03	1.54-03	1.21-03	9.62-04	7.56-04	5.50-04		
13	4.84-02	1.90-02	1.06-02	6.75-03	4.66-03	3.39-03	2.55-03	1.97-03	1.54-03	1.20-03	8.70-04			
12	6.13-02	2.42-02	1.35-02	8.68-03	6.02-03	4.39-03	3.32-03	2.56-03	1.97-03	1.42-03				
11	7.94-02	3.15-02	1.77-02	1.14-02	7.99-03	5.86-03	4.43-03	3.38-03	2.43-03					
10	1.06-01	4.22-02	2.39-02	1.56-02	1.10-02	8.08-03	6.08-03	4.35-03						
9	1.45-01	5.85-02	3.35-02	2.21-02	1.57-02	1.16-02	8.24-03							
8	2.08-01	8.48-02	4.93-02	3.30-02	2.37-02	1.68-02								
7	3.15-01	1.31-01	7.76-02	5.30-02	3.71-02									
6	5.16-01	2.19-01	1.35-01	9.23-02										
5	9.47-01	4.20-01	2.68-01											
4	2.10+00	1.00+00												
3	6.76+00													

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.23-06	6.16-06	5.28-06	4.56-06	3.96-06	3.47-06	3.05-06	2.69-06	2.39-06	2.12-06	1.90-06	1.70-06	1.53-06	1.38-06
45	9.99-06	8.50-06	7.29-06	6.30-06	5.48-06	4.79-06	4.21-06	3.71-06	3.29-06	2.93-06	2.62-06	2.34-06	2.11-06	1.90-06
40	1.43-05	1.22-05	1.04-05	9.02-06	7.84-06	6.85-06	6.02-06	5.31-06	4.70-06	4.18-06	3.73-06	3.33-06	2.99-06	2.68-06
35	2.15-05	1.83-05	1.57-05	1.36-05	1.18-05	1.03-05	9.01-06	7.94-06	7.01-06	6.21-06	5.52-06	4.91-06	4.37-06	3.89-06
30	3.44-05	2.93-05	2.51-05	2.17-05	1.88-05	1.63-05	1.43-05	1.25-05	1.09-05	9.57-06	8.34-06	7.20-06	6.06-06	4.73-06
29	3.82-05	3.25-05	2.79-05	2.40-05	2.08-05	1.81-05	1.58-05	1.38-05	1.20-05	1.04-05	8.95-06	7.52-06	5.84-06	
28	4.25-05	3.62-05	3.10-05	2.67-05	2.31-05	2.00-05	1.74-05	1.51-05	1.31-05	1.12-05	9.39-06	7.27-06		
27	4.76-05	4.05-05	3.46-05	2.98-05	2.57-05	2.23-05	1.93-05	1.66-05	1.42-05	1.18-05	9.12-06			
26	5.34-05	4.54-05	3.88-05	3.34-05	2.87-05	2.48-05	2.13-05	1.81-05	1.50-05	1.15-05				
25	6.03-05	5.12-05	4.37-05	3.75-05	3.21-05	2.75-05	2.33-05	1.93-05	1.47-05					
24	6.83-05	5.80-05	4.94-05	4.22-05	3.59-05	3.04-05	2.50-05	1.90-05						
23	7.78-05	6.59-05	5.60-05	4.75-05	3.99-05	3.28-05	2.48-05							
22	8.91-05	7.52-05	6.35-05	5.32-05	4.35-05	3.28-05								
21	1.03-04	8.61-05	7.18-05	5.85-05	4.39-05									
20	1.18-04	9.83-05	7.97-05	5.95-05										
19	1.37-04	1.10-04	8.20-05											
18	1.55-04	1.15-04												
17	1.64-04													

HE + TE = 1.25+04 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.83-38	2.79-38	5.58-38	1.09-37	1.97-37	3.31-37	5.22-37	7.82-37	1.12-36	1.56-36	2.11-36	2.77-36	3.56-36
45	0.00+00	2.52-38	3.90-38	7.97-38	1.58-37	2.89-37	4.87-37	7.68-37	1.15-36	1.64-36	2.24-36	2.97-36	3.82-36	4.76-36
40	0.00+00	3.60-38	5.66-38	1.17-37	2.37-37	4.37-37	7.43-37	1.18-36	1.77-36	2.54-36	3.48-36	4.60-36	5.86-36	7.19-36
35	0.00+00	5.42-38	8.64-38	1.82-37	3.73-37	6.99-37	1.21-36	1.94-36	2.96-36	4.28-36	5.94-36	7.92-36	1.01-35	1.24-35
30	0.00+00	8.71-38	1.41-37	3.05-37	6.37-37	1.22-36	2.15-36	3.53-36	5.49-36	8.13-36	1.15-35	1.57-35	2.03-35	2.49-35
29	0.00+00	9.68-38	1.58-37	3.42-37	7.18-37	1.38-36	2.44-36	4.04-36	6.32-36	9.43-36	1.34-35	1.84-35	2.39-35	2.92-35
28	0.00+00	1.08-37	1.77-37	3.85-37	8.13-37	1.57-36	2.80-36	4.66-36	7.34-36	1.10-35	1.58-35	2.17-35	2.84-35	3.46-35
27	0.00+00	1.21-37	1.99-37	4.36-37	9.25-37	1.80-36	3.23-36	5.41-36	8.58-36	1.30-35	1.88-35	2.60-35	3.41-35	4.13-35
26	0.00+00	1.36-37	2.25-37	4.96-37	1.06-36	2.08-36	3.75-36	6.34-36	1.01-35	1.54-35	2.25-35	3.14-35	4.13-35	4.96-35
25	0.00+00	1.54-37	2.56-37	5.68-37	1.22-36	2.41-36	4.39-36	7.48-36	1.21-35	1.86-35	2.74-35	3.84-35	5.06-35	5.99-35
24	0.00+00	1.75-37	2.93-37	6.55-37	1.42-36	2.83-36	5.19-36	8.93-36	1.46-35	2.27-35	3.37-35	4.77-35	6.29-35	7.22-35
23	0.00+00	2.00-37	3.37-37	7.60-37	1.66-36	3.34-36	6.20-36	1.08-35	1.78-35	2.80-35	4.22-35	6.02-35	7.90-35	8.57-35
22	0.00+00	2.30-37	3.91-37	8.90-37	1.97-36	3.99-36	7.49-36	1.32-35	2.21-35	3.53-35	5.38-35	7.74-35	1.00-34	9.63-35
21	0.00+00	2.66-37	4.57-37	1.05-36	2.35-36	4.82-36	9.18-36	1.64-35	2.79-35	4.53-35	7.02-35	1.01-34	1.27-34	8.84-35
20	0.00+00	3.11-37	5.39-37	1.25-36	2.84-36	5.91-36	1.14-35	2.08-35	3.60-35	5.97-35	9.39-35	1.36-34	1.55-34	2.77-36
19	0.00+00	3.66-37	6.42-37	1.51-36	3.48-36	7.36-36	1.45-35	2.69-35	4.77-35	8.08-35	1.29-34	1.83-34	1.62-34	-4.13-34
18	0.00+00	4.35-37	7.73-37	1.85-36	4.33-36	9.34-36	1.88-35	3.58-35	6.52-35	1.13-34	1.84-34	2.44-34	1.99-35	-2.52-33
17	0.00+00	5.23-37	9.43-37	2.30-36	5.49-36	1.21-35	2.51-35	4.92-35	9.26-35	1.66-34	2.70-34	2.75-34	-1.05-33	-1.75-32
16	0.00+00	6.37-37	1.17-36	2.91-36	7.12-36	1.62-35	3.45-35	7.04-35	1.38-34	2.57-34	3.95-34	-9.56-35	-1.01-32	-2.84-31
15	0.00+00	7.88-37	1.47-36	3.77-36	9.49-36	2.23-35	4.97-35	1.06-34	2.20-34	4.20-34	4.94-34	-4.84-33	-1.89-31	
14	0.00+00	9.90-37	1.90-36	5.01-36	1.31-35	3.22-35	7.57-35	1.73-34	3.82-34	7.00-34	-1.41-33	-1.16-31		
13	0.00+00	1.27-36	2.51-36	6.88-36	1.88-35	4.92-35	1.24-34	3.11-34	7.37-34	5.73-34	-6.32-32			
12	0.00+00	1.67-36	3.41-36	9.86-36	2.88-35	8.14-35	2.29-34	6.48-34	1.49-33	-2.77-32				
11	0.00+00	2.26-36	4.84-36	1.50-35	4.76-35	1.51-34	4.98-34	1.68-33	-6.45-33					
10	0.00+00	3.18-36	7.25-36	2.45-35	8.86-35	3.37-34	1.45-33	4.14-33						
9	0.00+00	4.69-36	1.17-35	4.52-35	1.99-34	1.05-33	7.53-33							
8	0.00+00	7.40-36	2.09-35	1.00-34	6.33-34	6.86-33								
7	0.00+00	1.29-35	4.47-35	3.16-34	4.58-33									
6	0.00+00	2.62-35	1.33-34	2.33-33										
5	0.00+00	7.09-35	8.97-34											
4	0.00+00	3.87-34												
3	0.00+00													

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.49-36	5.55-36	6.72-36	7.99-36	9.30-36	1.06-35	1.17-35	1.24-35	1.24-35	1.14-35	8.64-36	3.25-36	-6.07-36	-2.12-35
45	5.75-36	6.71-36	7.53-36	7.98-36	7.79-36	6.47-36	3.37-36	-2.54-36	-1.28-35	-2.95-35	-5.61-35	-9.75-35	-1.61-34	-2.59-34
40	8.44-36	9.37-36	9.59-36	8.43-36	4.87-36	-2.73-36	-1.70-35	-4.19-35	-8.41-35	-1.54-34	-2.69-34	-4.57-34	-7.66-34	-1.28-33
35	1.43-35	1.50-35	1.34-35	6.87-36	-8.56-36	-4.02-35	-1.01-34	-2.13-34	-4.21-34	-8.03-34	-1.52-33	-2.89-33	-5.65-33	-1.15-32
30	2.76-35	2.58-35	1.22-35	-2.69-35	-1.21-34	-3.31-34	-7.99-34	-1.85-33	-4.34-33	-1.06-32	-2.87-32	-9.16-32	-4.03-31	-3.93-30
29	3.22-35	2.81-35	6.72-36	-5.40-35	-2.03-34	-5.52-34	-1.37-33	-3.36-33	-8.55-33	-2.38-32	-7.81-32	-3.53-31	-3.54-30	
28	3.73-35	2.94-35	-5.25-36	-1.04-34	-3.53-34	-9.70-34	-2.53-33	-6.73-33	-1.94-32	-6.57-32	-3.07-31	-3.17-30		
27	4.31-35	2.83-35	-3.03-35	-1.99-34	-6.46-34	-1.83-33	-5.16-33	-1.55-32	-5.45-32	-2.63-31	-2.81-30			
26	4.91-35	2.10-35	-8.32-35	-3.92-34	-1.27-33	-3.84-33	-1.21-32	-4.45-32	-2.23-31	-2.48-30				
25	5.40-35	-8.30-37	-1.99-34	-8.16-34	-2.74-33	-9.25-33	-3.56-32	-1.86-31	-2.16-30					
24	5.37-35	-5.85-35	-4.68-34	-1.86-33	-6.83-33	-2.79-32	-1.53-31	-1.87-30						
23	3.71-35	-2.10-34	-1.16-33	-4.83-33	-2.12-32	-1.24-31	-1.59-30							
22	-2.91-35	-6.36-34	-3.23-33	-1.57-32	-9.77-32	-1.34-30								
21	-2.55-34	-2.00-33	-1.11-32	-7.52-32	-1.10-30									
20	-1.07-33	-7.44-33	-5.62-32	-8.94-31										
19	-4.62-33	-4.03-32	-7.07-31											
18	-2.75-32	-5.42-31												
17	-4.01-31													

HE + TE = 1.25+04 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 1.296-12 4-3 RC = 2.819-13 4-3 EM = 1.195-24 2S RC = 3.578-13 2P RC = 9.383-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.18-03	4.30-04	2.17-04	1.28-04	8.28-05	5.70-05	4.11-05	3.06-05	2.35-05	1.84-05	1.47-05	1.19-05	9.82-06	8.17-06
45	1.45-03	5.40-04	2.80-04	1.69-04	1.11-04	7.72-05	5.61-05	4.21-05	3.25-05	2.56-05	2.05-05	1.67-05	1.37-05	1.15-05
40	1.91-03	7.22-04	3.82-04	2.34-04	1.55-04	1.09-04	7.98-05	6.02-05	4.66-05	3.68-05	2.96-05	2.41-05	1.99-05	1.66-05
35	2.72-03	1.04-03	5.55-04	3.43-04	2.29-04	1.62-04	1.19-04	9.02-05	7.00-05	5.54-05	4.46-05	3.64-05	3.01-05	2.51-05
30	4.20-03	1.61-03	8.69-04	5.39-04	3.63-04	2.57-04	1.90-04	1.44-04	1.12-04	8.87-05	7.15-05	5.84-05	4.83-05	4.04-05
29	4.63-03	1.78-03	9.60-04	5.96-04	4.01-04	2.85-04	2.10-04	1.59-04	1.24-04	9.84-05	7.93-05	6.48-05	5.36-05	4.48-05
28	5.12-03	1.97-03	1.06-03	6.62-04	4.46-04	3.16-04	2.33-04	1.77-04	1.38-04	1.10-04	8.83-05	7.22-05	5.97-05	5.00-05
27	5.69-03	2.19-03	1.18-03	7.37-04	4.97-04	3.53-04	2.61-04	1.98-04	1.54-04	1.22-04	9.87-05	8.08-05	6.68-05	5.59-05
26	6.35-03	2.45-03	1.32-03	8.25-04	5.57-04	3.96-04	2.92-04	2.22-04	1.73-04	1.37-04	1.11-04	9.07-05	7.51-05	6.28-05
25	7.11-03	2.75-03	1.49-03	9.27-04	6.26-04	4.45-04	3.29-04	2.51-04	1.95-04	1.55-04	1.25-04	1.02-04	8.47-05	7.08-05
24	8.01-03	3.10-03	1.68-03	1.05-03	7.08-04	5.04-04	3.73-04	2.84-04	2.21-04	1.76-04	1.42-04	1.16-04	9.61-05	8.03-05
23	9.08-03	3.51-03	1.91-03	1.19-03	8.05-04	5.74-04	4.25-04	3.23-04	2.52-04	2.01-04	1.62-04	1.33-04	1.10-04	9.16-05
22	1.03-02	4.00-03	2.17-03	1.36-03	9.20-04	6.57-04	4.86-04	3.71-04	2.89-04	2.30-04	1.86-04	1.52-04	1.26-04	1.05-04
21	1.18-02	4.59-03	2.50-03	1.56-03	1.06-03	7.57-04	5.61-04	4.28-04	3.34-04	2.66-04	2.15-04	1.76-04	1.45-04	1.21-04
20	1.37-02	5.31-03	2.89-03	1.81-03	1.23-03	8.78-04	6.52-04	4.98-04	3.89-04	3.10-04	2.50-04	2.05-04	1.69-04	1.41-04
19	1.59-02	6.17-03	3.37-03	2.11-03	1.44-03	1.03-03	7.64-04	5.84-04	4.57-04	3.64-04	2.94-04	2.40-04	1.98-04	1.64-04
18	1.86-02	7.25-03	3.96-03	2.49-03	1.69-03	1.21-03	9.04-04	6.92-04	5.41-04	4.31-04	3.48-04	2.84-04	2.34-04	1.92-04
17	2.20-02	8.58-03	4.70-03	2.96-03	2.02-03	1.45-03	1.08-03	8.28-04	6.48-04	5.17-04	4.17-04	3.39-04	2.76-04	2.22-04
16	2.63-02	1.03-02	5.64-03	3.56-03	2.43-03	1.75-03	1.31-03	1.00-03	7.86-04	6.26-04	5.04-04	4.07-04	3.25-04	2.43-04
15	3.18-02	1.25-02	6.85-03	4.34-03	2.98-03	2.15-03	1.60-03	1.23-03	9.67-04	7.69-04	6.15-04	4.87-04	3.62-04	
14	3.90-02	1.53-02	8.45-03	5.37-03	3.69-03	2.67-03	2.00-03	1.54-03	1.21-03	9.55-04	7.50-04	5.53-04		
13	4.85-02	1.91-02	1.06-02	6.76-03	4.67-03	3.39-03	2.54-03	1.96-03	1.53-03	1.19-03	8.73-04			
12	6.15-02	2.43-02	1.35-02	8.69-03	6.03-03	4.39-03	3.31-03	2.54-03	1.96-03	1.43-03				
11	7.97-02	3.16-02	1.77-02	1.15-02	7.99-03	5.85-03	4.41-03	3.36-03	2.43-03					
10	1.06-01	4.23-02	2.40-02	1.56-02	1.10-02	8.06-03	6.04-03	4.34-03						
9	1.46-01	5.87-02	3.36-02	2.21-02	1.57-02	1.15-02	8.22-03							
8	2.09-01	8.50-02	4.94-02	3.30-02	2.36-02	1.67-02								
7	3.16-01	1.31-01	7.78-02	5.30-02	3.70-02									
6	5.17-01	2.20-01	1.35-01	9.21-02										
5	9.50-01	4.21-01	2.68-01											
4	2.11+00	1.00+00												
3	6.77+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.88-06	5.84-06	5.00-06	4.32-06	3.75-06	3.28-06	2.88-06	2.54-06	2.26-06	2.01-06	1.80-06	1.61-06	1.45-06	1.31-06
45	9.66-06	8.22-06	7.04-06	6.08-06	5.28-06	4.61-06	4.05-06	3.58-06	3.17-06	2.83-06	2.53-06	2.27-06	2.04-06	1.84-06
40	1.40-05	1.19-05	1.02-05	8.82-06	7.66-06	6.70-06	5.88-06	5.19-06	4.60-06	4.09-06	3.65-06	3.27-06	2.93-06	2.64-06
35	2.12-05	1.80-05	1.55-05	1.34-05	1.16-05	1.01-05	8.87-06	7.82-06	6.91-06	6.13-06	5.45-06	4.86-06	4.34-06	3.88-06
30	3.41-05	2.90-05	2.48-05	2.14-05	1.86-05	1.62-05	1.41-05	1.24-05	1.09-05	9.54-06	8.37-06	7.29-06	6.24-06	5.01-06
29	3.78-05	3.22-05	2.76-05	2.37-05	2.06-05	1.79-05	1.56-05	1.36-05	1.19-05	1.04-05	9.05-06	7.72-06	6.17-06	
28	4.21-05	3.58-05	3.07-05	2.64-05	2.28-05	1.98-05	1.73-05	1.50-05	1.31-05	1.13-05	9.62-06	7.66-06		
27	4.71-05	4.01-05	3.43-05	2.95-05	2.55-05	2.21-05	1.91-05	1.66-05	1.43-05	1.21-05	9.59-06			
26	5.29-05	4.50-05	3.84-05	3.30-05	2.84-05	2.46-05	2.12-05	1.82-05	1.53-05	1.21-05				
25	5.97-05	5.07-05	4.33-05	3.71-05	3.19-05	2.74-05	2.34-05	1.96-05	1.54-05					
24	6.77-05	5.74-05	4.89-05	4.18-05	3.57-05	3.03-05	2.54-05	1.98-05						
23	7.71-05	6.52-05	5.54-05	4.71-05	3.99-05	3.31-05	2.58-05							
22	8.83-05	7.45-05	6.30-05	5.30-05	4.38-05	3.39-05								
21	1.02-04	8.53-05	7.14-05	5.88-05	4.52-05									
20	1.17-04	9.76-05	7.99-05	6.12-05										
19	1.36-04	1.10-04	8.40-05											
18	1.55-04	1.17-04												
17	1.67-04													

HE + TE = 1.25+04 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.76-38	2.14-38	3.43-38	6.01-38	1.10-37	2.06-37	3.83-37	6.91-37	1.21-36	2.03-36	3.31-36	5.22-36	8.02-36
45	0.00+00	2.52-38	3.53-38	6.52-38	1.23-37	2.24-37	3.93-37	6.63-37	1.09-36	1.73-36	2.69-36	4.09-36	6.09-36	8.92-36
40	0.00+00	3.64-38	5.49-38	1.09-37	2.13-37	3.92-37	6.74-37	1.10-36	1.71-36	2.59-36	3.79-36	5.44-36	7.65-36	1.06-35
35	0.00+00	5.47-38	8.57-38	1.77-37	3.57-37	6.65-37	1.15-36	1.86-36	2.86-36	4.22-36	6.02-36	8.33-36	1.12-35	1.48-35
30	0.00+00	8.75-38	1.41-37	3.01-37	6.22-37	1.18-36	2.08-36	3.41-36	5.31-36	7.88-36	1.12-35	1.55-35	2.05-35	2.62-35
29	0.00+00	9.72-38	1.57-37	3.37-37	7.03-37	1.34-36	2.37-36	3.91-36	6.11-36	9.11-36	1.30-35	1.80-35	2.39-35	3.03-35
28	0.00+00	1.08-37	1.76-37	3.80-37	7.97-37	1.53-36	2.72-36	4.51-36	7.09-36	1.06-35	1.53-35	2.12-35	2.81-35	3.56-35
27	0.00+00	1.21-37	1.98-37	4.31-37	9.09-37	1.76-36	3.14-36	5.24-36	8.29-36	1.25-35	1.81-35	2.52-35	3.36-35	4.23-35
26	0.00+00	1.36-37	2.24-37	4.91-37	1.04-36	2.03-36	3.65-36	6.14-36	9.78-36	1.49-35	2.17-35	3.04-35	4.06-35	5.08-35
25	0.00+00	1.54-37	2.55-37	5.62-37	1.20-36	2.36-36	4.28-36	7.26-36	1.17-35	1.79-35	2.63-35	3.71-35	4.98-35	6.19-35
24	0.00+00	1.75-37	2.92-37	6.48-37	1.40-36	2.77-36	5.06-36	8.67-36	1.41-35	2.18-35	3.24-35	4.61-35	6.20-35	7.60-35
23	0.00+00	2.00-37	3.36-37	7.53-37	1.64-36	3.27-36	6.05-36	1.05-35	1.72-35	2.70-35	4.06-35	5.83-35	7.85-35	9.38-35
22	0.00+00	2.30-37	3.90-37	8.82-37	1.94-36	3.91-36	7.31-36	1.28-35	2.13-35	3.40-35	5.18-35	7.52-35	1.01-34	1.15-34
21	0.00+00	2.66-37	4.55-37	1.04-36	2.32-36	4.73-36	8.97-36	1.60-35	2.70-35	4.37-35	6.77-35	9.94-35	1.32-34	1.33-34
20	0.00+00	3.11-37	5.37-37	1.24-36	2.80-36	5.81-36	1.12-35	2.02-35	3.48-35	5.76-35	9.09-35	1.35-34	1.73-34	1.21-34
19	0.00+00	3.66-37	6.40-37	1.50-36	3.43-36	7.23-36	1.42-35	2.62-35	4.62-35	7.81-35	1.26-34	1.87-34	2.18-34	-4.96-35
18	0.00+00	4.36-37	7.71-37	1.84-36	4.27-36	9.18-36	1.84-35	3.48-35	6.32-35	1.10-34	1.82-34	2.66-34	2.12-34	-1.09-33
17	0.00+00	5.24-37	9.40-37	2.28-36	5.42-36	1.19-35	2.45-35	4.79-35	8.99-35	1.62-34	2.74-34	3.65-34	-2.32-34	-8.78-33
16	0.00+00	6.38-37	1.17-36	2.89-36	7.03-36	1.59-35	3.38-35	6.86-35	1.35-34	2.54-34	4.29-34	3.32-34	-4.76-33	-1.39-31
15	0.00+00	7.89-37	1.47-36	3.74-36	9.37-36	2.19-35	4.86-35	1.04-34	2.16-34	4.26-34	6.50-34	-1.83-33	-9.47-32	
14	0.00+00	9.91-37	1.89-36	4.97-36	1.29-35	3.17-35	7.41-35	1.69-34	3.78-34	7.73-34	1.36-34	-5.87-32		
13	0.00+00	1.27-36	2.50-36	6.83-36	1.86-35	4.84-35	1.22-34	3.05-34	7.53-34	1.27-33	-3.11-32			
12	0.00+00	1.67-36	3.40-36	9.78-36	2.84-35	8.00-35	2.24-34	6.43-34	1.74-33	-1.16-32				
11	0.00+00	2.26-36	4.83-36	1.48-35	4.70-35	1.49-34	4.90-34	1.74-33	5.80-34					
10	0.00+00	3.18-36	7.22-36	2.43-35	8.74-35	3.32-34	1.45-33	6.62-33						
9	0.00+00	4.69-36	1.16-35	4.48-35	1.96-34	1.03-33	8.14-33							
8	0.00+00	7.41-36	2.08-35	9.95-35	6.24-34	6.89-33								
7	0.00+00	1.29-35	4.45-35	3.13-34	4.53-33									
6	0.00+00	2.62-35	1.32-34	2.30-33										
5	0.00+00	7.09-35	8.91-34											
4	0.00+00	3.87-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.20-35	1.76-35	2.54-35	3.61-35	5.05-35	6.98-35	9.56-35	1.30-34	1.75-34	2.35-34	3.13-34	4.16-34	5.53-34	7.33-34
45	1.29-35	1.83-35	2.57-35	3.58-35	4.94-35	6.75-35	9.21-35	1.25-34	1.68-34	2.27-34	3.06-34	4.11-34	5.55-34	7.51-34
40	1.45-35	1.96-35	2.63-35	3.50-35	4.63-35	6.10-35	8.01-35	1.05-34	1.37-34	1.80-34	2.36-34	3.10-34	4.08-34	5.39-34
35	1.90-35	2.38-35	2.91-35	3.44-35	3.88-35	4.05-35	3.64-35	2.03-35	-1.95-35	-1.05-34	-2.81-34	-6.41-34	-1.39-33	-3.00-33
30	3.17-35	3.55-35	3.43-35	2.13-35	-1.77-35	-1.12-34	-3.26-34	-8.08-34	-1.92-33	-4.66-33	-1.22-32	-3.72-32	-1.54-31	-1.38-30
29	3.62-35	3.92-35	3.38-35	8.67-36	-6.08-35	-2.29-34	-6.24-34	-1.57-33	-3.94-33	-1.06-32	-3.32-32	-1.41-31	-1.29-30	
28	4.19-35	4.31-35	3.04-35	-1.59-35	-1.41-34	-4.52-34	-1.22-33	-3.23-33	-9.02-33	-2.90-32	-1.26-31	-1.19-30		
27	4.87-35	4.66-35	2.07-35	-6.48-35	-2.98-34	-9.09-34	-2.56-33	-7.48-33	-2.49-32	-1.12-31	-1.08-30			
26	5.69-35	4.80-35	-3.25-36	-1.67-34	-6.31-34	-1.95-33	-6.03-33	-2.09-32	-9.73-32	-9.76-31				
25	6.62-35	4.32-35	-6.03-35	-3.93-34	-1.41-33	-4.71-33	-1.72-32	-8.34-32	-8.69-31					
24	7.51-35	2.11-35	-2.00-34	-9.49-34	-3.53-33	-1.38-32	-7.03-32	-7.65-31						
23	7.86-35	-4.93-35	-5.67-34	-2.52-33	-1.07-32	-5.81-32	-6.65-31							
22	6.02-35	-2.64-34	-1.66-33	-8.05-33	-4.69-32	-5.70-31								
21	-3.73-35	-9.74-34	-5.74-33	-3.68-32	-4.80-31									
20	-4.40-34	-3.81-33	-2.80-32	-3.97-31										
19	-2.27-33	-2.04-32	-3.22-31											
18	-1.40-32	-2.53-31												
17	-1.92-31													

HE + TE = 1.25+04 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 1.299-12 4-3 RC = 2.798-13 4-3 EM = 1.186-24 2S RC = 3.596-13 2P RC = 9.392-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.97-03	6.39-04	2.89-04	1.56-04	9.46-05	6.19-05	4.28-05	3.09-05	2.31-05	1.77-05	1.39-05	1.11-05	9.02-06	7.43-06
45	2.28-03	7.66-04	3.58-04	1.98-04	1.23-04	8.16-05	5.72-05	4.18-05	3.15-05	2.43-05	1.92-05	1.54-05	1.26-05	1.04-05
40	2.66-03	9.37-04	4.56-04	2.62-04	1.66-04	1.13-04	8.02-05	5.92-05	4.51-05	3.51-05	2.79-05	2.26-05	1.85-05	1.54-05
35	3.30-03	1.21-03	6.18-04	3.67-04	2.39-04	1.65-04	1.19-04	8.90-05	6.83-05	5.36-05	4.29-05	3.48-05	2.86-05	2.38-05
30	4.61-03	1.74-03	9.15-04	5.58-04	3.70-04	2.60-04	1.90-04	1.43-04	1.10-04	8.71-05	6.98-05	5.69-05	4.69-05	3.91-05
29	5.01-03	1.89-03	1.00-03	6.14-04	4.09-04	2.87-04	2.10-04	1.59-04	1.23-04	9.68-05	7.77-05	6.33-05	5.22-05	4.35-05
28	5.48-03	2.08-03	1.10-03	6.79-04	4.53-04	3.19-04	2.34-04	1.77-04	1.37-04	1.08-04	8.67-05	7.06-05	5.82-05	4.85-05
27	6.02-03	2.29-03	1.22-03	7.54-04	5.04-04	3.56-04	2.61-04	1.97-04	1.53-04	1.21-04	9.71-05	7.91-05	6.52-05	5.44-05
26	6.66-03	2.54-03	1.36-03	8.41-04	5.64-04	3.98-04	2.93-04	2.22-04	1.72-04	1.36-04	1.09-04	8.90-05	7.34-05	6.12-05
25	7.41-03	2.84-03	1.52-03	9.43-04	6.33-04	4.48-04	3.30-04	2.50-04	1.94-04	1.53-04	1.23-04	1.01-04	8.29-05	6.91-05
24	8.29-03	3.18-03	1.71-03	1.06-03	7.15-04	5.07-04	3.73-04	2.83-04	2.20-04	1.74-04	1.40-04	1.14-04	9.41-05	7.84-05
23	9.34-03	3.60-03	1.94-03	1.21-03	8.12-04	5.77-04	4.25-04	3.23-04	2.51-04	1.99-04	1.60-04	1.30-04	1.07-04	8.94-05
22	1.06-02	4.09-03	2.21-03	1.38-03	9.29-04	6.60-04	4.87-04	3.70-04	2.88-04	2.28-04	1.83-04	1.50-04	1.23-04	1.02-04
21	1.21-02	4.68-03	2.53-03	1.58-03	1.07-03	7.60-04	5.62-04	4.27-04	3.32-04	2.63-04	2.12-04	1.73-04	1.42-04	1.18-04
20	1.39-02	5.40-03	2.93-03	1.83-03	1.24-03	8.82-04	6.53-04	4.97-04	3.87-04	3.07-04	2.47-04	2.01-04	1.65-04	1.37-04
19	1.62-02	6.27-03	3.41-03	2.14-03	1.45-03	1.03-03	7.65-04	5.82-04	4.54-04	3.60-04	2.89-04	2.36-04	1.93-04	1.59-04
18	1.89-02	7.35-03	4.01-03	2.51-03	1.71-03	1.22-03	9.04-04	6.89-04	5.37-04	4.26-04	3.43-04	2.78-04	2.27-04	1.86-04
17	2.24-02	8.70-03	4.75-03	2.99-03	2.03-03	1.46-03	1.08-03	8.25-04	6.43-04	5.10-04	4.09-04	3.31-04	2.69-04	2.15-04
16	2.67-02	1.04-02	5.70-03	3.59-03	2.45-03	1.76-03	1.31-03	9.98-04	7.79-04	6.17-04	4.94-04	3.97-04	3.15-04	2.36-04
15	3.23-02	1.26-02	6.93-03	4.38-03	2.99-03	2.15-03	1.60-03	1.23-03	9.56-04	7.56-04	6.00-04	4.73-04	3.51-04	
14	3.95-02	1.55-02	8.54-03	5.42-03	3.71-03	2.67-03	2.00-03	1.53-03	1.19-03	9.35-04	7.30-04	5.37-04		
13	4.92-02	1.93-02	1.07-02	6.82-03	4.69-03	3.39-03	2.53-03	1.94-03	1.50-03	1.16-03	8.48-04			
12	6.23-02	2.46-02	1.37-02	8.76-03	6.05-03	4.39-03	3.29-03	2.51-03	1.92-03	1.39-03				
11	8.07-02	3.20-02	1.79-02	1.15-02	8.02-03	5.84-03	4.37-03	3.30-03	2.36-03					
10	1.07-01	4.28-02	2.42-02	1.57-02	1.10-02	8.02-03	5.95-03	4.23-03						
9	1.48-01	5.94-02	3.39-02	2.22-02	1.57-02	1.14-02	8.04-03							
8	2.11-01	8.60-02	4.98-02	3.31-02	2.35-02	1.64-02								
7	3.20-01	1.32-01	7.83-02	5.29-02	3.65-02									
6	5.24-01	2.22-01	1.35-01	9.11-02										
5	9.61-01	4.24-01	2.66-01											
4	2.13+00	1.00+00												
3	6.81+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.19-06	5.22-06	4.44-06	3.80-06	3.29-06	2.86-06	2.50-06	2.20-06	1.95-06	1.73-06	1.55-06	1.39-06	1.25-06	1.13-06
45	8.72-06	7.37-06	6.29-06	5.41-06	4.68-06	4.08-06	3.58-06	3.15-06	2.79-06	2.49-06	2.22-06	1.99-06	1.79-06	1.62-06
40	1.29-05	1.09-05	9.34-06	8.05-06	6.98-06	6.09-06	5.34-06	4.71-06	4.17-06	3.71-06	3.32-06	2.97-06	2.67-06	2.41-06
35	2.00-05	1.70-05	1.45-05	1.25-05	1.09-05	9.46-06	8.31-06	7.32-06	6.47-06	5.75-06	5.12-06	4.57-06	4.09-06	3.66-06
30	3.29-05	2.79-05	2.38-05	2.05-05	1.77-05	1.54-05	1.35-05	1.18-05	1.04-05	9.13-06	8.02-06	7.01-06	6.04-06	4.89-06
29	3.66-05	3.10-05	2.65-05	2.28-05	1.97-05	1.71-05	1.49-05	1.31-05	1.14-05	1.00-05	8.71-06	7.47-06	6.03-06	
28	4.08-05	3.46-05	2.96-05	2.54-05	2.19-05	1.90-05	1.66-05	1.44-05	1.26-05	1.09-05	9.31-06	7.49-06		
27	4.57-05	3.88-05	3.31-05	2.84-05	2.45-05	2.12-05	1.84-05	1.59-05	1.38-05	1.17-05	9.37-06			
26	5.14-05	4.36-05	3.71-05	3.18-05	2.74-05	2.36-05	2.04-05	1.75-05	1.48-05	1.18-05				
25	5.80-05	4.91-05	4.18-05	3.58-05	3.07-05	2.64-05	2.25-05	1.90-05	1.51-05					
24	6.58-05	5.56-05	4.73-05	4.03-05	3.44-05	2.93-05	2.45-05	1.99-05						
23	7.50-05	6.32-05	5.36-05	4.55-05	3.85-05	3.21-05	2.52-05							
22	8.58-05	7.22-05	6.08-05	5.12-05	4.24-05	3.31-05								
21	9.86-05	8.26-05	6.90-05	5.68-05	4.41-05									
20	1.14-04	9.44-05	7.73-05	5.95-05										
19	1.31-04	1.07-04	8.17-05											
18	1.50-04	1.14-04												
17	1.62-04													

HE + TE = 1.25+04 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.03-38	-8.88-39	-4.88-38	-1.16-37	-2.03-37	-2.77-37	-2.69-37	-6.17-38	5.27-37	1.76-36	4.03-36	7.85-36	1.39-35
45	0.00+00	1.84-38	4.71-39	-2.11-38	-6.12-38	-9.85-38	-8.66-38	6.38-38	5.01-37	1.46-36	3.25-36	6.41-36	1.16-35	1.97-35
40	0.00+00	3.20-38	2.98-38	3.29-38	4.67-38	9.94-38	2.51-37	6.10-37	1.35-36	2.74-36	5.18-36	9.24-36	1.57-35	2.58-35
35	0.00+00	5.33-38	7.02-38	1.22-37	2.27-37	4.28-37	7.99-37	1.46-36	2.61-36	4.52-36	7.63-36	1.26-35	2.02-35	3.19-35
30	0.00+00	8.84-38	1.34-37	2.66-37	5.29-37	9.92-37	1.76-36	2.97-36	4.84-36	7.66-36	1.19-35	1.80-35	2.71-35	4.05-35
29	0.00+00	9.82-38	1.51-37	3.06-37	6.14-37	1.16-36	2.04-36	3.44-36	5.55-36	8.68-36	1.33-35	1.99-35	2.94-35	4.32-35
28	0.00+00	1.09-37	1.71-37	3.51-37	7.11-37	1.34-36	2.38-36	3.99-36	6.40-36	9.92-36	1.50-35	2.22-35	3.23-35	4.66-35
27	0.00+00	1.22-37	1.94-37	4.03-37	8.25-37	1.57-36	2.78-36	4.65-36	7.43-36	1.15-35	1.72-35	2.51-35	3.60-35	5.09-35
26	0.00+00	1.38-37	2.20-37	4.64-37	9.58-37	1.83-36	3.26-36	5.46-36	8.72-36	1.34-35	1.99-35	2.89-35	4.08-35	5.64-35
25	0.00+00	1.55-37	2.51-37	5.35-37	1.12-36	2.15-36	3.85-36	6.47-36	1.03-35	1.59-35	2.35-35	3.38-35	4.71-35	6.33-35
24	0.00+00	1.76-37	2.88-37	6.21-37	1.31-36	2.54-36	4.57-36	7.73-36	1.24-35	1.91-35	2.83-35	4.04-35	5.55-35	7.19-35
23	0.00+00	2.01-37	3.31-37	7.24-37	1.54-36	3.02-36	5.49-36	9.35-36	1.51-35	2.34-35	3.47-35	4.94-35	6.66-35	8.21-35
22	0.00+00	2.31-37	3.85-37	8.50-37	1.83-36	3.62-36	6.65-36	1.14-35	1.87-35	2.91-35	4.35-35	6.17-35	8.15-35	9.25-35
21	0.00+00	2.67-37	4.50-37	1.01-36	2.19-36	4.40-36	8.17-36	1.42-35	2.35-35	3.71-35	5.58-35	7.91-35	1.01-34	9.67-35
20	0.00+00	3.12-37	5.30-37	1.20-36	2.65-36	5.40-36	1.02-35	1.80-35	3.02-35	4.84-35	7.37-35	1.04-34	1.25-34	7.06-35
19	0.00+00	3.67-37	6.32-37	1.45-36	3.26-36	6.74-36	1.29-35	2.33-35	3.99-35	6.51-35	1.00-34	1.40-34	1.44-34	-8.67-35
18	0.00+00	4.37-37	7.61-37	1.78-36	4.06-36	8.56-36	1.68-35	3.09-35	5.43-35	9.08-35	1.42-34	1.90-34	1.09-34	-8.84-34
17	0.00+00	5.25-37	9.29-37	2.21-36	5.16-36	1.11-35	2.23-35	4.24-35	7.68-35	1.32-34	2.08-34	2.41-34	-2.84-34	-6.10-33
16	0.00+00	6.39-37	1.15-36	2.80-36	6.69-36	1.48-35	3.08-35	6.06-35	1.14-34	2.03-34	3.14-34	1.56-34	-3.57-33	-8.32-32
15	0.00+00	7.90-37	1.45-36	3.63-36	8.92-36	2.05-35	4.42-35	9.12-35	1.81-34	3.33-34	4.39-34	-1.56-33	-5.97-32	
14	0.00+00	9.93-37	1.87-36	4.82-36	1.23-35	2.95-35	6.71-35	1.47-34	3.12-34	5.80-34	-9.51-35	-3.93-32		
13	0.00+00	1.27-36	2.47-36	6.62-36	1.77-35	4.49-35	1.10-34	2.63-34	6.04-34	8.46-34	-2.24-32			
12	0.00+00	1.67-36	3.36-36	9.49-36	2.70-35	7.40-35	2.00-34	5.43-34	1.32-33	-9.35-33				
11	0.00+00	2.26-36	4.77-36	1.44-35	4.45-35	1.37-34	4.31-34	1.41-33	-3.52-34					
10	0.00+00	3.18-36	7.13-36	2.35-35	8.25-35	3.02-34	1.24-33	4.76-33						
9	0.00+00	4.70-36	1.15-35	4.33-35	1.84-34	9.22-34	6.54-33							
8	0.00+00	7.41-36	2.05-35	9.57-35	5.78-34	5.93-33								
7	0.00+00	1.29-35	4.38-35	2.99-34	4.10-33									
6	0.00+00	2.62-35	1.29-34	2.17-33										
5	0.00+00	7.09-35	8.65-34											
4	0.00+00	3.85-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.32-35	3.70-35	5.69-35	8.51-35	1.25-34	1.79-34	2.54-34	3.55-34	4.92-34	6.76-34	9.22-34	1.25-33	1.69-33	2.28-33
45	3.20-35	5.02-35	7.67-35	1.15-34	1.69-34	2.44-34	3.50-34	4.96-34	6.98-34	9.79-34	1.37-33	1.91-33	2.66-33	3.72-33
40	4.11-35	6.39-35	9.75-35	1.46-34	2.17-34	3.18-34	4.64-34	6.74-34	9.77-34	1.42-33	2.06-33	3.01-33	4.43-33	6.61-33
35	4.97-35	7.64-35	1.16-34	1.76-34	2.65-34	3.98-34	5.99-34	9.07-34	1.38-33	2.14-33	3.36-33	5.43-33	9.08-33	1.60-32
30	6.01-35	8.91-35	1.32-34	1.98-34	2.99-34	4.57-34	7.12-34	1.14-33	1.89-33	3.32-33	6.38-33	1.43-32	4.45-32	3.41-31
29	6.31-35	9.20-35	1.34-34	1.98-34	2.93-34	4.41-34	6.74-34	1.06-33	1.71-33	2.93-33	5.89-33	1.31-32	8.65-32	
28	6.67-35	9.49-35	1.35-34	1.91-34	2.71-34	3.82-34	5.29-34	6.92-34	7.29-34	-1.56-34	-7.13-33	-8.04-32		
27	7.09-35	9.73-35	1.31-34	1.71-34	2.10-34	2.19-34	8.99-35	-5.75-34	-3.53-33	-1.94-32	-1.85-31			
26	7.57-35	9.78-35	1.18-34	1.21-34	5.85-35	-2.19-34	-1.24-33	-5.28-33	-2.60-32	-2.44-31				
25	8.06-35	9.32-35	8.28-35	-3.71-36	-3.32-34	-1.48-33	-5.91-33	-2.86-32	-2.72-31					
24	8.41-35	7.50-35	-7.08-36	-3.23-34	-1.44-33	-5.80-33	-2.85-32	-2.78-31						
23	8.17-35	2.06-35	-2.45-34	-1.24-33	-5.23-33	-2.65-32	-2.68-31							
22	5.95-35	-1.38-34	-9.47-34	-4.39-33	-2.36-32	-2.49-31								
21	-2.65-35	-6.35-34	-3.45-33	-2.00-32	-2.24-31									
20	-3.39-34	-2.51-33	-1.62-32	-1.96-31										
19	-1.63-33	-1.25-32	-1.67-31											
18	-9.13-33	-1.37-31												
17	-1.09-31													

HE + TE = 1.25+04 NE = 1.00+05 CASE B NC = 70

TOTAL RC = 1.304-12 4-3 RC = 2.763-13 4-3 EM = 1.171-24 2S RC = 3.630-13 2P RC = 9.411-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.73-03	8.46-04	3.66-04	1.91-04	1.12-04	7.15-05	4.83-05	3.42-05	2.51-05	1.90-05	1.47-05	1.16-05	9.34-06	7.63-06
45	3.42-03	1.06-03	4.64-04	2.44-04	1.44-04	9.20-05	6.25-05	4.44-05	3.27-05	2.48-05	1.92-05	1.52-05	1.23-05	1.00-05
40	4.32-03	1.37-03	6.04-04	3.21-04	1.92-04	1.24-04	8.48-05	6.06-05	4.49-05	3.42-05	2.67-05	2.12-05	1.72-05	1.41-05
35	5.39-03	1.76-03	8.02-04	4.37-04	2.66-04	1.75-04	1.21-04	8.79-05	6.58-05	5.06-05	3.97-05	3.18-05	2.59-05	2.13-05
30	6.67-03	2.31-03	1.11-03	6.28-04	3.95-04	2.66-04	1.88-04	1.39-04	1.05-04	8.17-05	6.47-05	5.22-05	4.27-05	3.54-05
29	6.99-03	2.45-03	1.19-03	6.83-04	4.33-04	2.93-04	2.08-04	1.54-04	1.17-04	9.10-05	7.22-05	5.83-05	4.77-05	3.96-05
28	7.37-03	2.62-03	1.29-03	7.46-04	4.76-04	3.24-04	2.31-04	1.71-04	1.31-04	1.02-04	8.10-05	6.54-05	5.36-05	4.45-05
27	7.81-03	2.81-03	1.40-03	8.19-04	5.26-04	3.60-04	2.58-04	1.92-04	1.47-04	1.15-04	9.12-05	7.37-05	6.05-05	5.02-05
26	8.33-03	3.03-03	1.53-03	9.04-04	5.85-04	4.03-04	2.90-04	2.16-04	1.65-04	1.29-04	1.03-04	8.34-05	6.85-05	5.68-05
25	8.96-03	3.30-03	1.69-03	1.00-03	6.54-04	4.52-04	3.27-04	2.44-04	1.87-04	1.47-04	1.17-04	9.48-05	7.78-05	6.46-05
24	9.73-03	3.61-03	1.87-03	1.12-03	7.35-04	5.11-04	3.70-04	2.77-04	2.13-04	1.67-04	1.34-04	1.08-04	8.88-05	7.37-05
23	1.07-02	3.99-03	2.09-03	1.26-03	8.32-04	5.81-04	4.22-04	3.17-04	2.44-04	1.92-04	1.53-04	1.24-04	1.02-04	8.44-05
22	1.18-02	4.45-03	2.35-03	1.43-03	9.48-04	6.64-04	4.84-04	3.64-04	2.81-04	2.21-04	1.76-04	1.43-04	1.17-04	9.71-05
21	1.32-02	5.02-03	2.66-03	1.63-03	1.09-03	7.65-04	5.59-04	4.21-04	3.25-04	2.56-04	2.04-04	1.66-04	1.36-04	1.12-04
20	1.50-02	5.71-03	3.05-03	1.88-03	1.26-03	8.87-04	6.50-04	4.90-04	3.79-04	2.98-04	2.39-04	1.93-04	1.58-04	1.30-04
19	1.72-02	6.57-03	3.53-03	2.19-03	1.47-03	1.04-03	7.62-04	5.76-04	4.45-04	3.51-04	2.80-04	2.27-04	1.85-04	1.52-04
18	1.99-02	7.65-03	4.13-03	2.57-03	1.73-03	1.22-03	9.01-04	6.82-04	5.27-04	4.15-04	3.32-04	2.68-04	2.18-04	1.77-04
17	2.33-02	9.00-03	4.88-03	3.05-03	2.06-03	1.46-03	1.08-03	8.15-04	6.31-04	4.97-04	3.96-04	3.18-04	2.57-04	2.05-04
16	2.77-02	1.07-02	5.84-03	3.66-03	2.47-03	1.76-03	1.30-03	9.86-04	7.64-04	6.00-04	4.77-04	3.80-04	3.01-04	2.25-04
15	3.33-02	1.30-02	7.08-03	4.45-03	3.02-03	2.15-03	1.59-03	1.21-03	9.35-04	7.33-04	5.78-04	4.52-04	3.35-04	
14	4.07-02	1.59-02	8.71-03	5.49-03	3.74-03	2.68-03	1.98-03	1.50-03	1.16-03	9.04-04	6.99-04	5.12-04		
13	5.05-02	1.98-02	1.09-02	6.91-03	4.72-03	3.39-03	2.51-03	1.90-03	1.46-03	1.12-03	8.10-04			
12	6.39-02	2.52-02	1.39-02	8.87-03	6.08-03	4.38-03	3.25-03	2.45-03	1.85-03	1.33-03				
11	8.27-02	3.27-02	1.82-02	1.17-02	8.05-03	5.80-03	4.30-03	3.20-03	2.27-03					
10	1.10-01	4.37-02	2.46-02	1.58-02	1.10-02	7.93-03	5.81-03	4.07-03						
9	1.51-01	6.06-02	3.44-02	2.24-02	1.56-02	1.12-02	7.75-03							
8	2.16-01	8.77-02	5.05-02	3.32-02	2.32-02	1.59-02								
7	3.28-01	1.35-01	7.91-02	5.28-02	3.56-02									
6	5.36-01	2.26-01	1.36-01	8.95-02										
5	9.82-01	4.29-01	2.64-01											
4	2.18+00	1.00+00												
3	6.89+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.30-06	5.27-06	4.45-06	3.80-06	3.26-06	2.82-06	2.46-06	2.16-06	1.90-06	1.68-06	1.50-06	1.34-06	1.20-06	1.08-06
45	8.31-06	6.96-06	5.89-06	5.02-06	4.32-06	3.74-06	3.27-06	2.87-06	2.53-06	2.24-06	1.99-06	1.78-06	1.60-06	1.44-06
40	1.17-05	9.82-06	8.33-06	7.12-06	6.14-06	5.33-06	4.65-06	4.09-06	3.61-06	3.20-06	2.85-06	2.55-06	2.29-06	2.06-06
35	1.78-05	1.50-05	1.27-05	1.09-05	9.44-06	8.21-06	7.18-06	6.32-06	5.58-06	4.95-06	4.41-06	3.94-06	3.53-06	3.17-06
30	2.96-05	2.50-05	2.13-05	1.83-05	1.58-05	1.38-05	1.20-05	1.06-05	9.30-06	8.20-06	7.23-06	6.35-06	5.50-06	4.49-06
29	3.32-05	2.80-05	2.39-05	2.05-05	1.77-05	1.54-05	1.35-05	1.18-05	1.03-05	9.08-06	7.94-06	6.85-06	5.57-06	
28	3.73-05	3.15-05	2.69-05	2.31-05	1.99-05	1.73-05	1.51-05	1.31-05	1.15-05	1.00-05	8.59-06	6.96-06		
27	4.20-05	3.56-05	3.03-05	2.60-05	2.24-05	1.94-05	1.69-05	1.47-05	1.27-05	1.09-05	8.75-06			
26	4.76-05	4.02-05	3.43-05	2.93-05	2.53-05	2.18-05	1.89-05	1.63-05	1.38-05	1.11-05				
25	5.41-05	4.57-05	3.88-05	3.32-05	2.85-05	2.45-05	2.10-05	1.77-05	1.42-05					
24	6.17-05	5.20-05	4.41-05	3.76-05	3.21-05	2.74-05	2.30-05	1.83-05						
23	7.06-05	5.94-05	5.03-05	4.26-05	3.61-05	3.02-05	2.38-05							
22	8.11-05	6.80-05	5.73-05	4.82-05	4.00-05	3.14-05								
21	9.34-05	7.81-05	6.51-05	5.37-05	4.18-05									
20	1.08-04	8.94-05	7.32-05	5.66-05										
19	1.25-04	1.01-04	7.77-05											
18	1.43-04	1.09-04												
17	1.54-04													

HE + TE = 1.25+04 NE = 1.00+05 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	2.97-39	-3.90-38	-1.35-37	-3.15-37	-5.99-37	-9.91-37	-1.46-36	-1.95-36	-2.33-36	-2.41-36	-1.91-36	-4.32-37	2.58-36
45	0.00+00	7.50-39	-3.95-38	-1.44-37	-3.34-37	-6.19-37	-9.74-37	-1.33-36	-1.53-36	-1.33-36	-3.48-37	1.97-36	6.44-36	1.42-35
40	0.00+00	1.63-38	-3.41-38	-1.43-37	-3.33-37	-5.97-37	-8.74-37	-1.02-36	-7.71-37	3.06-37	2.89-36	7.98-36	1.71-35	3.23-35
35	0.00+00	3.53-38	-8.17-39	-9.57-38	-2.38-37	-3.97-37	-4.54-37	-1.64-37	9.09-37	3.48-36	8.70-36	1.83-35	3.50-35	6.28-35
30	0.00+00	7.52-38	6.28-38	5.45-38	6.75-38	1.88-37	6.13-37	1.72-36	4.17-36	9.09-36	1.83-35	3.47-35	6.32-35	1.12-34
29	0.00+00	8.70-38	8.49-38	1.03-37	1.66-37	3.72-37	9.37-37	2.27-36	5.07-36	1.06-35	2.07-35	3.89-35	7.03-35	1.24-34
28	0.00+00	1.00-37	1.10-37	1.59-37	2.80-37	5.86-37	1.31-36	2.89-36	6.08-36	1.22-35	2.34-35	4.32-35	7.78-35	1.37-34
27	0.00+00	1.16-37	1.39-37	2.23-37	4.13-37	8.33-37	1.74-36	3.59-36	7.21-36	1.40-35	2.62-35	4.80-35	8.60-35	1.52-34
26	0.00+00	1.33-37	1.72-37	2.97-37	5.66-37	1.12-36	2.24-36	4.41-36	8.51-36	1.60-35	2.95-35	5.33-35	9.50-35	1.68-34
25	0.00+00	1.53-37	2.10-37	3.82-37	7.44-37	1.46-36	2.82-36	5.38-36	1.00-35	1.84-35	3.32-35	5.93-35	1.05-34	1.87-34
24	0.00+00	1.76-37	2.53-37	4.81-37	9.53-37	1.86-36	3.53-36	6.54-36	1.19-35	2.12-35	3.76-35	6.64-35	1.17-34	2.08-34
23	0.00+00	2.02-37	3.02-37	5.96-37	1.20-36	2.34-36	4.38-36	7.96-36	1.41-35	2.48-35	4.31-35	7.49-35	1.31-34	2.33-34
22	0.00+00	2.34-37	3.60-37	7.32-37	1.50-36	2.92-36	5.44-36	9.76-36	1.71-35	2.93-35	5.00-35	8.57-35	1.48-34	2.62-34
21	0.00+00	2.71-37	4.29-37	8.95-37	1.86-36	3.66-36	6.80-36	1.21-35	2.09-35	3.54-35	5.94-35	9.98-35	1.70-34	2.94-34
20	0.00+00	3.16-37	5.12-37	1.09-36	2.31-36	4.59-36	8.57-36	1.52-35	2.61-35	4.38-35	7.24-35	1.19-34	1.95-34	3.18-34
19	0.00+00	3.72-37	6.14-37	1.34-36	2.89-36	5.81-36	1.09-35	1.96-35	3.36-35	5.60-35	9.12-35	1.45-34	2.18-34	3.82-34
18	0.00+00	4.41-37	7.43-37	1.66-36	3.65-36	7.46-36	1.42-35	2.58-35	4.46-35	7.48-35	1.19-34	1.77-34	2.06-34	-1.02-34
17	0.00+00	5.29-37	9.08-37	2.08-36	4.67-36	9.75-36	1.90-35	3.50-35	6.16-35	1.04-34	1.62-34	2.03-34	-4.35-35	-2.95-33
16	0.00+00	6.44-37	1.13-36	2.64-36	6.09-36	1.30-35	2.61-35	4.95-35	8.94-35	1.52-34	2.22-34	1.06-34	-2.13-33	-4.43-32
15	0.00+00	7.94-37	1.42-36	3.43-36	8.14-36	1.80-35	3.74-35	7.37-35	1.38-34	2.35-34	2.62-34	-1.18-33	-3.51-32	
14	0.00+00	9.97-37	1.83-36	4.56-36	1.12-35	2.59-35	5.65-35	1.17-34	2.30-34	3.75-34	-2.98-34	-2.54-32		
13	0.00+00	1.28-36	2.42-36	6.27-36	1.62-35	3.94-35	9.17-35	2.05-34	4.25-34	3.90-34	-1.61-32			
12	0.00+00	1.68-36	3.29-36	8.98-36	2.46-35	6.41-35	1.65-34	4.11-34	8.26-34	-8.03-33				
11	0.00+00	2.27-36	4.66-36	1.36-35	4.05-35	1.18-34	3.48-34	1.00-33	-1.71-33					
10	0.00+00	3.19-36	6.97-36	2.22-35	7.46-35	2.58-34	9.60-34	2.50-33						
9	0.00+00	4.71-36	1.12-35	4.07-35	1.65-34	7.65-34	4.51-33							
8	0.00+00	7.43-36	2.00-35	8.94-35	5.08-34	4.61-33								
7	0.00+00	1.29-35	4.25-35	2.76-34	3.47-33									
6	0.00+00	2.63-35	1.25-34	1.95-33										
5	0.00+00	7.09-35	8.22-34											
4	0.00+00	3.83-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.83-36	1.63-35	2.90-35	4.77-35	7.39-35	1.10-34	1.58-34	2.22-34	3.05-34	4.10-34	5.42-34	7.04-34	9.00-34	1.13-33
45	2.67-35	4.60-35	7.49-35	1.17-34	1.77-34	2.61-34	3.77-34	5.37-34	7.53-34	1.04-33	1.43-33	1.95-33	2.64-33	3.56-33
40	5.66-35	9.43-35	1.51-34	2.36-34	3.60-34	5.41-34	8.02-34	1.18-33	1.71-33	2.49-33	3.60-33	5.23-33	7.62-33	1.12-32
35	1.08-34	1.79-34	2.90-34	4.61-34	7.25-34	1.13-33	1.76-33	2.74-33	4.28-33	6.76-33	1.09-32	1.79-32	3.04-32	5.44-32
30	1.92-34	3.26-34	5.48-34	9.18-34	1.54-33	2.62-33	4.53-33	8.08-33	1.51-32	3.00-32	6.63-32	1.74-31	6.25-31	4.91-30
29	2.14-34	3.67-34	6.24-34	1.06-33	1.83-33	3.20-33	5.75-33	1.08-32	2.16-32	4.80-32	1.26-31	4.55-31	3.57-30	
28	2.39-34	4.13-34	7.13-34	1.24-33	2.19-33	3.98-33	7.52-33	1.52-32	3.38-32	8.87-32	3.20-31	2.50-30		
27	2.66-34	4.66-34	8.20-34	1.46-33	2.68-33	5.09-33	1.03-32	2.30-32	6.05-32	2.17-31	1.68-30			
26	2.97-34	5.28-34	9.50-34	1.75-33	3.35-33	6.80-33	1.52-32	3.98-32	1.42-31	1.09-30				
25	3.33-34	6.02-34	1.11-33	2.14-33	4.34-33	9.67-33	2.52-32	8.87-32	6.71-31					
24	3.75-34	6.92-34	1.32-33	2.67-33	5.90-33	1.51-32	5.23-32	3.86-31						
23	4.24-34	7.98-34	1.59-33	3.43-33	8.55-33	2.83-32	1.97-31							
22	4.79-34	9.17-34	1.89-33	4.42-33	1.32-32	7.94-32								
21	5.27-34	9.89-34	1.98-33	4.29-33	8.75-33									
20	5.05-34	6.63-34	-5.58-34	-3.02-32										
19	6.76-35	-2.75-33	-4.85-32											
18	-3.32-33	-5.38-32												
17	-5.12-32													

HE + TE = 1.25+04 NE = 1.00+06 CASE B NC = 70

TOTAL RC = 1.315-12 4-3 RC = 2.710-13 4-3 EM = 1.149-24 2S RC = 3.691-13 2P RC = 9.457-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.81-03	1.17-03	5.03-04	2.61-04	1.52-04	9.66-05	6.51-05	4.59-05	3.36-05	2.53-05	1.95-05	1.54-05	1.23-05	1.01-05
45	4.65-03	1.43-03	6.16-04	3.20-04	1.87-04	1.18-04	7.98-05	5.63-05	4.12-05	3.11-05	2.40-05	1.89-05	1.52-05	1.24-05
40	5.79-03	1.78-03	7.70-04	4.00-04	2.34-04	1.49-04	1.00-04	7.10-05	5.20-05	3.93-05	3.03-05	2.39-05	1.92-05	1.57-05
35	7.59-03	2.35-03	1.02-03	5.33-04	3.13-04	2.00-04	1.35-04	9.58-05	7.04-05	5.32-05	4.12-05	3.26-05	2.62-05	2.14-05
30	1.04-02	3.27-03	1.44-03	7.62-04	4.53-04	2.92-04	1.99-04	1.42-04	1.05-04	7.97-05	6.21-05	4.93-05	3.97-05	3.25-05
29	1.11-02	3.51-03	1.55-03	8.25-04	4.92-04	3.18-04	2.17-04	1.55-04	1.15-04	8.76-05	6.83-05	5.43-05	4.38-05	3.59-05
28	1.18-02	3.77-03	1.68-03	8.95-04	5.36-04	3.48-04	2.39-04	1.71-04	1.27-04	9.68-05	7.56-05	6.02-05	4.87-05	3.99-05
27	1.26-02	4.04-03	1.81-03	9.74-04	5.87-04	3.82-04	2.63-04	1.89-04	1.41-04	1.08-04	8.42-05	6.71-05	5.43-05	4.46-05
26	1.34-02	4.34-03	1.96-03	1.06-03	6.45-04	4.22-04	2.92-04	2.10-04	1.57-04	1.20-04	9.43-05	7.53-05	6.11-05	5.02-05
25	1.43-02	4.67-03	2.14-03	1.17-03	7.12-04	4.68-04	3.25-04	2.36-04	1.76-04	1.35-04	1.06-04	8.51-05	6.91-05	5.69-05
24	1.52-02	5.04-03	2.33-03	1.29-03	7.90-04	5.23-04	3.65-04	2.66-04	1.99-04	1.54-04	1.21-04	9.69-05	7.88-05	6.50-05
23	1.62-02	5.44-03	2.55-03	1.42-03	8.84-04	5.89-04	4.13-04	3.02-04	2.28-04	1.76-04	1.39-04	1.11-04	9.06-05	7.47-05
22	1.72-02	5.91-03	2.82-03	1.59-03	9.96-04	6.68-04	4.72-04	3.46-04	2.62-04	2.03-04	1.60-04	1.29-04	1.05-04	8.65-05
21	1.85-02	6.45-03	3.13-03	1.79-03	1.13-03	7.65-04	5.43-04	4.00-04	3.04-04	2.36-04	1.87-04	1.50-04	1.22-04	1.01-04
20	2.00-02	7.11-03	3.51-03	2.03-03	1.30-03	8.84-04	6.31-04	4.67-04	3.55-04	2.76-04	2.19-04	1.76-04	1.44-04	1.18-04
19	2.18-02	7.90-03	3.97-03	2.33-03	1.50-03	1.03-03	7.40-04	5.50-04	4.19-04	3.27-04	2.59-04	2.08-04	1.69-04	1.39-04
18	2.42-02	8.89-03	4.55-03	2.71-03	1.76-03	1.22-03	8.77-04	6.53-04	4.99-04	3.89-04	3.09-04	2.48-04	2.01-04	1.63-04
17	2.73-02	1.02-02	5.28-03	3.18-03	2.09-03	1.45-03	1.05-03	7.85-04	6.00-04	4.68-04	3.71-04	2.96-04	2.38-04	1.90-04
16	3.13-02	1.18-02	6.22-03	3.79-03	2.51-03	1.75-03	1.27-03	9.52-04	7.29-04	5.68-04	4.48-04	3.56-04	2.80-04	2.10-04
15	3.67-02	1.40-02	7.45-03	4.58-03	3.05-03	2.14-03	1.56-03	1.17-03	8.95-04	6.95-04	5.44-04	4.24-04	3.13-04	
14	4.40-02	1.69-02	9.08-03	5.63-03	3.77-03	2.66-03	1.94-03	1.46-03	1.11-03	8.57-04	6.59-04	4.81-04		
13	5.38-02	2.08-02	1.13-02	7.05-03	4.75-03	3.36-03	2.46-03	1.84-03	1.40-03	1.06-03	7.62-04			
12	6.74-02	2.62-02	1.44-02	9.03-03	6.11-03	4.33-03	3.17-03	2.36-03	1.76-03	1.25-03				
11	8.66-02	3.40-02	1.87-02	1.18-02	8.06-03	5.72-03	4.17-03	3.06-03	2.14-03					
10	1.15-01	4.53-02	2.52-02	1.60-02	1.10-02	7.78-03	5.60-03	3.86-03						
9	1.57-01	6.26-02	3.52-02	2.26-02	1.55-02	1.09-02	7.39-03							
8	2.25-01	9.05-02	5.15-02	3.33-02	2.28-02	1.52-02								
7	3.40-01	1.39-01	8.03-02	5.24-02	3.43-02									
6	5.55-01	2.31-01	1.37-01	8.71-02										
5	1.02+00	4.37-01	2.60-01											
4	2.25+00	1.00+00												
3	7.02+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.30-06	6.92-06	5.84-06	4.97-06	4.26-06	3.69-06	3.21-06	2.81-06	2.47-06	2.19-06	1.94-06	1.74-06	1.56-06	1.40-06
45	1.02-05	8.52-06	7.19-06	6.12-06	5.25-06	4.54-06	3.95-06	3.46-06	3.05-06	2.69-06	2.40-06	2.14-06	1.92-06	1.72-06
40	1.29-05	1.08-05	9.12-06	7.76-06	6.66-06	5.76-06	5.01-06	4.39-06	3.86-06	3.42-06	3.04-06	2.71-06	2.43-06	2.18-06
35	1.77-05	1.48-05	1.25-05	1.06-05	9.13-06	7.90-06	6.87-06	6.02-06	5.30-06	4.68-06	4.16-06	3.71-06	3.31-06	2.97-06
30	2.70-05	2.26-05	1.91-05	1.63-05	1.40-05	1.21-05	1.06-05	9.24-06	8.11-06	7.14-06	6.29-06	5.53-06	4.79-06	3.92-06
29	2.98-05	2.50-05	2.12-05	1.81-05	1.55-05	1.34-05	1.17-05	1.02-05	8.95-06	7.86-06	6.87-06	5.98-06	4.85-06	
28	3.31-05	2.78-05	2.36-05	2.01-05	1.73-05	1.50-05	1.30-05	1.13-05	9.91-06	8.63-06	7.43-06	6.04-06		
27	3.71-05	3.11-05	2.64-05	2.25-05	1.94-05	1.67-05	1.45-05	1.26-05	1.10-05	9.39-06	7.61-06			
26	4.18-05	3.51-05	2.97-05	2.54-05	2.18-05	1.88-05	1.63-05	1.41-05	1.20-05	9.68-06				
25	4.74-05	3.98-05	3.37-05	2.88-05	2.47-05	2.12-05	1.82-05	1.55-05	1.24-05					
24	5.41-05	4.55-05	3.85-05	3.28-05	2.80-05	2.40-05	2.02-05	1.62-05						
23	6.22-05	5.23-05	4.42-05	3.75-05	3.18-05	2.67-05	2.12-05							
22	7.20-05	6.04-05	5.09-05	4.29-05	3.58-05	2.82-05								
21	8.37-05	7.00-05	5.85-05	4.84-05	3.80-05									
20	9.77-05	8.10-05	6.65-05	5.17-05										
19	1.14-04	9.28-05	7.15-05											
18	1.32-04	1.00-04												
17	1.44-04													

HE + TE = 1.25+04 NE = 1.00+06 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-6.83-39	-8.25-38	-2.71-37	-6.63-37	-1.37-36	-2.54-36	-4.36-36	-7.05-36	-1.09-35	-1.63-35	-2.38-35	-3.42-35	-4.84-35
45	0.00+00	-3.71-39	-8.91-38	-2.99-37	-7.24-37	-1.48-36	-2.69-36	-4.52-36	-7.15-36	-1.08-35	-1.58-35	-2.25-35	-3.16-35	-4.40-35
40	0.00+00	2.98-39	-9.20-38	-3.18-37	-7.63-37	-1.52-36	-2.67-36	-4.28-36	-6.41-36	-9.08-36	-1.23-35	-1.60-35	-2.04-35	-2.56-35
35	0.00+00	1.51-38	-9.34-38	-3.42-37	-8.13-37	-1.56-36	-2.58-36	-3.80-36	-5.01-36	-5.78-36	-5.46-36	-3.04-36	2.91-36	1.43-35
30	0.00+00	4.07-38	-8.15-38	-3.51-37	-8.34-37	-1.53-36	-2.29-36	-2.75-36	-2.18-36	7.66-37	8.33-36	2.41-35	5.40-35	1.07-34
29	0.00+00	4.94-38	-7.31-38	-3.40-37	-8.12-37	-1.46-36	-2.11-36	-2.31-36	-1.13-36	3.06-36	1.31-35	3.35-35	7.19-35	1.40-34
28	0.00+00	6.02-38	-6.07-38	-3.20-37	-7.72-37	-1.37-36	-1.87-36	-1.72-36	1.98-37	5.90-36	1.89-35	4.51-35	9.43-35	1.83-34
27	0.00+00	7.34-38	-4.34-38	-2.90-37	-7.07-37	-1.22-36	-1.53-36	-9.53-37	1.87-36	9.42-36	2.61-35	5.94-35	1.22-34	2.37-34
26	0.00+00	8.96-38	-1.97-38	-2.44-37	-6.11-37	-1.01-36	-1.08-36	2.87-38	3.95-36	1.37-35	3.49-35	7.71-35	1.58-34	3.06-34
25	0.00+00	1.09-37	1.18-38	-1.81-37	-4.78-37	-7.29-37	-4.81-37	1.27-36	6.52-36	1.90-35	4.57-35	9.91-35	2.02-34	3.97-34
24	0.00+00	1.34-37	5.30-38	-9.48-38	-2.97-37	-3.57-37	2.77-37	2.81-36	9.66-36	2.55-35	5.89-35	1.26-34	2.59-34	5.16-34
23	0.00+00	1.64-37	1.06-37	1.76-38	-6.13-38	1.23-37	1.23-36	4.70-36	1.35-35	3.32-35	7.50-35	1.60-34	3.31-34	6.75-34
22	0.00+00	2.00-37	1.72-37	1.62-37	2.42-37	7.31-37	2.42-36	7.02-36	1.80-35	4.25-35	9.45-35	2.03-34	4.26-34	8.95-34
21	0.00+00	2.44-37	2.54-37	3.43-37	6.26-37	1.50-36	3.89-36	9.85-36	2.36-35	5.39-35	1.19-34	2.57-34	5.54-34	1.21-33
20	0.00+00	2.97-37	3.54-37	5.69-37	1.11-36	2.46-36	5.74-36	1.34-35	3.05-35	6.81-35	1.50-34	3.29-34	7.34-34	1.71-33
19	0.00+00	3.61-37	4.77-37	8.50-37	1.72-36	3.68-36	8.09-36	1.78-35	3.92-35	8.60-35	1.90-34	4.28-34	1.00-33	2.53-33
18	0.00+00	4.38-37	6.27-37	1.20-36	2.49-36	5.26-36	1.11-35	2.37-35	5.06-35	1.10-34	2.45-34	5.71-34	1.43-33	4.11-33
17	0.00+00	5.34-37	8.12-37	1.65-36	3.50-36	7.37-36	1.53-35	3.18-35	6.67-35	1.44-34	3.25-34	7.93-34	2.20-33	7.79-33
16	0.00+00	6.54-37	1.05-36	2.23-36	4.86-36	1.03-35	2.13-35	4.37-35	9.08-35	1.95-34	4.49-34	1.15-33	3.99-33	1.77-32
15	0.00+00	8.08-37	1.35-36	3.00-36	6.75-36	1.46-35	3.04-35	6.26-35	1.30-34	2.79-34	6.37-34	1.54-33	8.71-34	
14	0.00+00	1.01-36	1.76-36	4.09-36	9.54-36	2.12-35	4.55-35	9.56-35	2.01-34	4.20-34	7.21-34	-5.53-33		
13	0.00+00	1.30-36	2.33-36	5.69-36	1.39-35	3.24-35	7.27-35	1.60-34	3.40-34	5.37-34	-6.24-33			
12	0.00+00	1.70-36	3.18-36	8.19-36	2.13-35	5.30-35	1.28-34	3.03-34	5.98-34	-4.25-33				
11	0.00+00	2.29-36	4.51-36	1.24-35	3.49-35	9.61-35	2.62-34	6.85-34	-1.40-33					
10	0.00+00	3.22-36	6.73-36	2.03-35	6.40-35	2.06-34	6.89-34	1.18-33						
9	0.00+00	4.74-36	1.08-35	3.70-35	1.40-34	5.90-34	2.83-33							
8	0.00+00	7.48-36	1.92-35	8.06-35	4.22-34	3.30-33								
7	0.00+00	1.30-35	4.06-35	2.45-34	2.74-33									
6	0.00+00	2.63-35	1.18-34	1.68-33										
5	0.00+00	7.09-35	7.62-34											
4	0.00+00	3.81-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-6.79-35	-9.49-35	-1.32-34	-1.84-34	-2.57-34	-3.58-34	-4.98-34	-6.92-34	-9.59-34	-1.33-33	-1.83-33	-2.51-33	-3.45-33	-4.72-33
45	-6.10-35	-8.50-35	-1.19-34	-1.69-34	-2.41-34	-3.46-34	-4.99-34	-7.23-34	-1.05-33	-1.52-33	-2.20-33	-3.19-33	-4.62-33	-6.70-33
40	-3.22-35	-4.15-35	-5.58-35	-7.95-35	-1.20-34	-1.88-34	-3.04-34	-4.97-34	-8.14-34	-1.33-33	-2.16-33	-3.52-33	-5.72-33	-9.36-33
35	3.35-35	6.34-35	1.07-34	1.68-34	2.49-34	3.49-34	4.63-34	5.75-34	6.50-34	6.07-34	2.73-34	-7.44-34	-3.37-33	-9.93-33
30	1.97-34	3.45-34	5.87-34	9.76-34	1.60-33	2.63-33	4.34-33	7.28-33	1.26-32	2.32-32	4.66-32	1.10-31	3.50-31	2.38-30
29	2.58-34	4.57-34	7.88-34	1.34-33	2.27-33	3.87-33	6.72-33	1.20-32	2.29-32	4.77-32	1.17-31	3.93-31	2.85-30	
28	3.38-34	6.05-34	1.06-33	1.86-33	3.27-33	5.84-33	1.08-32	2.11-32	4.53-32	1.15-31	3.96-31	2.98-30		
27	4.41-34	8.04-34	1.45-33	2.62-33	4.82-33	9.14-33	1.83-32	4.04-32	1.05-31	3.71-31	2.87-30			
26	5.79-34	1.08-33	2.01-33	3.79-33	7.37-33	1.52-32	3.42-32	9.06-32	3.28-31	2.57-30				
25	7.64-34	1.46-33	2.84-33	5.66-33	1.19-32	2.75-32	7.43-32	2.74-31	2.18-30					
24	1.02-33	2.03-33	4.14-33	8.91-33	2.10-32	5.78-32	2.16-31	1.74-30						
23	1.38-33	2.89-33	6.35-33	1.52-32	4.26-32	1.62-31	1.32-30							
22	1.92-33	4.30-33	1.05-32	2.98-32	1.14-31	9.32-31								
21	2.77-33	6.87-33	1.97-32	7.60-32	6.19-31									
20	4.28-33	1.24-32	4.78-32	3.86-31										
19	7.34-33	2.81-32	2.22-31											
18	1.54-32	1.16-31												
17	5.27-32													

HE + TE = 1.25+04 NE = 1.00+07 CASE B NC = 56

TOTAL RC = 1.335-12 4-3 RC = 2.638-13 4-3 EM = 1.118-24 2S RC = 3.798-13 2P RC = 9.553-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.82-03	1.48-03	6.36-04	3.29-04	1.92-04	1.22-04	8.19-05	5.77-05	4.22-05	3.18-05	2.45-05	1.93-05	1.55-05	1.26-05
45	6.31-03	1.94-03	8.33-04	4.32-04	2.52-04	1.60-04	1.07-04	7.57-05	5.53-05	4.17-05	3.22-05	2.53-05	2.03-05	1.65-05
40	8.28-03	2.54-03	1.09-03	5.66-04	3.30-04	2.09-04	1.41-04	9.94-05	7.26-05	5.47-05	4.22-05	3.33-05	2.67-05	2.17-05
35	1.08-02	3.30-03	1.42-03	7.37-04	4.31-04	2.73-04	1.84-04	1.30-04	9.48-05	7.14-05	5.51-05	4.34-05	3.48-05	2.83-05
30	1.41-02	4.35-03	1.87-03	9.74-04	5.69-04	3.61-04	2.44-04	1.72-04	1.26-04	9.49-05	7.33-05	5.78-05	4.64-05	3.77-05
29	1.50-02	4.63-03	2.00-03	1.04-03	6.08-04	3.86-04	2.60-04	1.84-04	1.35-04	1.02-04	7.84-05	6.18-05	4.96-05	4.04-05
28	1.61-02	4.95-03	2.14-03	1.11-03	6.52-04	4.14-04	2.80-04	1.98-04	1.45-04	1.09-04	8.44-05	6.65-05	5.34-05	4.35-05
27	1.73-02	5.33-03	2.30-03	1.20-03	7.03-04	4.47-04	3.02-04	2.14-04	1.57-04	1.18-04	9.14-05	7.21-05	5.78-05	4.71-05
26	1.86-02	5.76-03	2.49-03	1.30-03	7.64-04	4.86-04	3.29-04	2.33-04	1.71-04	1.29-04	9.97-05	7.86-05	6.31-05	5.14-05
25	2.02-02	6.25-03	2.71-03	1.42-03	8.34-04	5.32-04	3.60-04	2.55-04	1.87-04	1.41-04	1.10-04	8.65-05	6.94-05	5.66-05
24	2.19-02	6.82-03	2.97-03	1.56-03	9.17-04	5.86-04	3.97-04	2.82-04	2.07-04	1.57-04	1.21-04	9.58-05	7.70-05	6.28-05
23	2.39-02	7.47-03	3.26-03	1.72-03	1.01-03	6.49-04	4.41-04	3.13-04	2.31-04	1.75-04	1.35-04	1.07-04	8.61-05	7.02-05
22	2.61-02	8.20-03	3.60-03	1.90-03	1.13-03	7.24-04	4.93-04	3.51-04	2.59-04	1.97-04	1.53-04	1.21-04	9.72-05	7.93-05
21	2.86-02	9.03-03	3.99-03	2.12-03	1.26-03	8.14-04	5.56-04	3.97-04	2.94-04	2.23-04	1.74-04	1.38-04	1.11-04	9.04-05
20	3.13-02	9.97-03	4.44-03	2.38-03	1.42-03	9.23-04	6.34-04	4.54-04	3.37-04	2.57-04	2.00-04	1.59-04	1.28-04	1.04-04
19	3.43-02	1.10-02	4.97-03	2.68-03	1.62-03	1.06-03	7.29-04	5.25-04	3.90-04	2.98-04	2.33-04	1.85-04	1.49-04	1.21-04
18	3.75-02	1.23-02	5.60-03	3.06-03	1.86-03	1.22-03	8.50-04	6.15-04	4.59-04	3.52-04	2.75-04	2.18-04	1.76-04	1.42-04
17	4.11-02	1.37-02	6.36-03	3.52-03	2.17-03	1.44-03	1.00-03	7.30-04	5.47-04	4.20-04	3.29-04	2.61-04	2.09-04	1.67-04
16	4.53-02	1.54-02	7.31-03	4.11-03	2.57-03	1.72-03	1.21-03	8.82-04	6.63-04	5.10-04	3.99-04	3.15-04	2.48-04	1.87-04
15	5.03-02	1.76-02	8.53-03	4.88-03	3.09-03	2.08-03	1.48-03	1.08-03	8.16-04	6.27-04	4.88-04	3.80-04	2.82-04	
14	5.69-02	2.04-02	1.01-02	5.91-03	3.78-03	2.56-03	1.84-03	1.35-03	1.02-03	7.80-04	5.97-04	4.37-04		
13	6.59-02	2.42-02	1.23-02	7.31-03	4.74-03	3.26-03	2.33-03	1.72-03	1.29-03	9.69-04	6.98-04			
12	7.88-02	2.94-02	1.54-02	9.27-03	6.08-03	4.20-03	3.01-03	2.21-03	1.63-03	1.15-03				
11	9.75-02	3.71-02	1.97-02	1.21-02	7.99-03	5.55-03	3.97-03	2.87-03	1.99-03					
10	1.26-01	4.85-02	2.62-02	1.63-02	1.08-02	7.51-03	5.30-03	3.61-03						
9	1.69-01	6.61-02	3.63-02	2.27-02	1.52-02	1.04-02	6.94-03							
8	2.40-01	9.49-02	5.28-02	3.33-02	2.21-02	1.44-02								
7	3.60-01	1.45-01	8.17-02	5.17-02	3.27-02									
6	5.87-01	2.40-01	1.37-01	8.41-02										
5	1.07+00	4.49-01	2.55-01											
4	2.35+00	1.00+00												
3	7.23+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.04-05	8.68-06	7.32-06	6.22-06	5.34-06	4.61-06	4.01-06	3.51-06	3.09-06	2.73-06	2.43-06	2.17-06	1.94-06	1.75-06
45	1.36-05	1.14-05	9.58-06	8.15-06	6.99-06	6.04-06	5.25-06	4.60-06	4.05-06	3.58-06	3.18-06	2.84-06	2.54-06	2.29-06
40	1.79-05	1.49-05	1.26-05	1.07-05	9.18-06	7.93-06	6.89-06	6.03-06	5.30-06	4.69-06	4.16-06	3.71-06	3.32-06	2.99-06
35	2.34-05	1.95-05	1.64-05	1.40-05	1.20-05	1.03-05	8.98-06	7.85-06	6.90-06	6.09-06	5.40-06	4.81-06	4.29-06	3.84-06
30	3.11-05	2.60-05	2.19-05	1.86-05	1.59-05	1.37-05	1.19-05	1.04-05	9.09-06	7.99-06	7.02-06	6.15-06	5.32-06	4.35-06
29	3.33-05	2.78-05	2.34-05	1.99-05	1.70-05	1.47-05	1.27-05	1.11-05	9.68-06	8.47-06	7.39-06	6.37-06	5.19-06	
28	3.59-05	2.99-05	2.52-05	2.14-05	1.83-05	1.58-05	1.37-05	1.19-05	1.03-05	8.97-06	7.70-06	6.25-06		
27	3.89-05	3.24-05	2.73-05	2.32-05	1.98-05	1.70-05	1.47-05	1.28-05	1.10-05	9.42-06	7.62-06			
26	4.24-05	3.54-05	2.98-05	2.53-05	2.16-05	1.85-05	1.60-05	1.37-05	1.17-05	9.39-06				
25	4.67-05	3.89-05	3.27-05	2.78-05	2.37-05	2.03-05	1.73-05	1.47-05	1.17-05					
24	5.18-05	4.32-05	3.63-05	3.07-05	2.61-05	2.22-05	1.87-05	1.49-05						
23	5.79-05	4.83-05	4.05-05	3.42-05	2.89-05	2.42-05	1.92-05							
22	6.54-05	5.44-05	4.56-05	3.82-05	3.18-05	2.50-05								
21	7.45-05	6.18-05	5.15-05	4.25-05	3.33-05									
20	8.57-05	7.07-05	5.79-05	4.51-05										
19	9.92-05	8.06-05	6.23-05											
18	1.15-04	8.78-05												
17	1.27-04													

HE + TE = 1.25+04 NE = 1.00+07 CASE B NC = 56

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.50-38	-1.20-37	-3.93-37	-9.79-37	-2.09-36	-4.00-36	-7.13-36	-1.20-35	-1.94-35	-3.05-35	-4.66-35	-6.98-35	-1.03-34
45	0.00+00	-1.77-38	-1.53-37	-5.04-37	-1.26-36	-2.69-36	-5.17-36	-9.24-36	-1.56-35	-2.54-35	-4.01-35	-6.18-35	-9.37-35	-1.40-34
40	0.00+00	-1.85-38	-1.90-37	-6.33-37	-1.58-36	-3.38-36	-6.50-36	-1.16-35	-1.97-35	-3.22-35	-5.12-35	-7.99-35	-1.23-34	-1.87-34
35	0.00+00	-1.22-38	-2.19-37	-7.45-37	-1.86-36	-3.96-36	-7.56-36	-1.34-35	-2.27-35	-3.71-35	-5.94-35	-9.38-35	-1.47-34	-2.30-34
30	0.00+00	9.56-39	-2.25-37	-8.06-37	-2.00-36	-4.17-36	-7.75-36	-1.34-35	-2.20-35	-3.50-35	-5.52-35	-8.74-35	-1.40-34	-2.27-34
29	0.00+00	1.66-38	-2.24-37	-8.15-37	-2.02-36	-4.18-36	-7.70-36	-1.31-35	-2.13-35	-3.34-35	-5.21-35	-8.20-35	-1.31-34	-2.16-34
28	0.00+00	2.47-38	-2.23-37	-8.25-37	-2.05-36	-4.20-36	-7.64-36	-1.28-35	-2.04-35	-3.15-35	-4.82-35	-7.48-35	-1.20-34	-1.98-34
27	0.00+00	3.42-38	-2.21-37	-8.37-37	-2.07-36	-4.21-36	-7.56-36	-1.25-35	-1.93-35	-2.90-35	-4.31-35	-6.53-35	-1.03-34	-1.73-34
26	0.00+00	4.55-38	-2.19-37	-8.49-37	-2.10-36	-4.23-36	-7.48-36	-1.20-35	-1.81-35	-2.59-35	-3.66-35	-5.28-35	-8.11-35	-1.36-34
25	0.00+00	5.90-38	-2.14-37	-8.61-37	-2.13-36	-4.25-36	-7.36-36	-1.15-35	-1.64-35	-2.19-35	-2.79-35	-3.56-35	-4.91-35	-8.08-35
24	0.00+00	7.56-38	-2.07-37	-8.68-37	-2.15-36	-4.24-36	-7.17-36	-1.07-35	-1.42-35	-1.65-35	-1.59-35	-1.10-35	-1.50-36	6.94-36
23	0.00+00	9.64-38	-1.94-37	-8.66-37	-2.15-36	-4.18-36	-6.84-36	-9.58-36	-1.11-35	-8.82-36	1.32-36	2.54-35	7.22-35	1.51-34
22	0.00+00	1.23-37	-1.72-37	-8.46-37	-2.11-36	-4.03-36	-6.29-36	-7.90-36	-6.54-36	2.26-36	2.67-35	8.10-35	1.91-34	4.00-34
21	0.00+00	1.57-37	-1.36-37	-7.98-37	-2.01-36	-3.73-36	-5.39-36	-5.36-36	8.57-38	1.86-35	6.50-35	1.69-34	3.89-34	8.51-34
20	0.00+00	2.02-37	-8.13-38	-7.05-37	-1.81-36	-3.21-36	-3.98-36	-1.58-36	9.85-36	4.29-35	1.24-34	3.11-34	7.36-34	1.73-33
19	0.00+00	2.60-37	2.00-39	-5.47-37	-1.46-36	-2.36-36	-1.81-36	4.02-36	2.43-35	7.96-35	2.18-34	5.53-34	1.39-33	3.64-33
18	0.00+00	3.36-37	1.24-37	-2.96-37	-9.03-37	-1.05-36	1.41-36	1.22-35	4.56-35	1.36-34	3.71-34	9.89-34	2.74-33	8.53-33
17	0.00+00	4.40-37	2.99-37	8.10-38	-5.47-38	9.13-37	6.16-36	2.43-35	7.78-35	2.26-34	6.37-34	1.85-33	6.04-33	2.58-32
16	0.00+00	5.75-37	5.45-37	6.32-37	1.20-36	3.79-36	1.31-35	4.21-35	1.27-34	3.75-34	1.14-33	3.85-33	1.69-32	1.53-31
15	0.00+00	7.53-37	8.84-37	1.42-36	3.02-36	8.00-36	2.33-35	6.90-35	2.07-34	6.46-34	2.24-33	1.00-32	9.03-32	
14	0.00+00	9.89-37	1.35-36	2.53-36	5.68-36	1.43-35	3.90-35	1.13-34	3.48-34	1.21-33	5.40-33	4.71-32		
13	0.00+00	1.30-36	1.98-36	4.14-36	9.71-36	2.43-35	6.51-35	1.90-34	6.35-34	2.71-33	2.17-32			
12	0.00+00	1.73-36	2.88-36	6.57-36	1.62-35	4.16-35	1.14-34	3.51-34	1.35-33	8.69-33				
11	0.00+00	2.35-36	4.23-36	1.05-35	2.78-35	7.59-35	2.23-34	7.71-34	3.43-33					
10	0.00+00	3.30-36	6.40-36	1.75-35	5.15-35	1.59-34	5.48-34	2.00-33						
9	0.00+00	4.84-36	1.03-35	3.21-35	1.12-34	4.38-34	2.04-33							
8	0.00+00	7.60-36	1.82-35	6.94-35	3.28-34	2.24-33								
7	0.00+00	1.32-35	3.82-35	2.07-34	2.01-33									
6	0.00+00	2.66-35	1.09-34	1.36-33										
5	0.00+00	7.13-35	6.84-34											
4	0.00+00	3.79-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.50-34	-2.15-34	-3.05-34	-4.26-34	-5.90-34	-8.09-34	-1.10-33	-1.48-33	-1.98-33	-2.63-33	-3.48-33	-4.56-33	-5.95-33	-7.71-33
45	-2.06-34	-3.01-34	-4.34-34	-6.19-34	-8.75-34	-1.23-33	-1.71-33	-2.36-33	-3.26-33	-4.47-33	-6.10-33	-8.32-33	-1.13-32	-1.53-32
40	-2.81-34	-4.20-34	-6.22-34	-9.14-34	-1.34-33	-1.94-33	-2.81-33	-4.05-33	-5.85-33	-8.46-33	-1.23-32	-1.79-32	-2.61-32	-3.86-32
35	-3.58-34	-5.56-34	-8.61-34	-1.33-33	-2.05-33	-3.17-33	-4.91-33	-7.67-33	-1.21-32	-1.94-32	-3.16-32	-5.29-32	-9.17-32	-1.67-31
30	-3.76-34	-6.29-34	-1.06-33	-1.82-33	-3.14-33	-5.52-33	-9.93-33	-1.85-32	-3.63-32	-7.65-32	-1.80-31	-5.04-31	-1.95-30	-1.67-29
29	-3.63-34	-6.23-34	-1.09-33	-1.92-33	-3.45-33	-6.33-33	-1.20-32	-2.40-32	-5.13-32	-1.22-31	-3.49-31	-1.38-30	-1.20-29	
28	-3.41-34	-6.04-34	-1.09-33	-2.02-33	-3.81-33	-7.40-33	-1.51-32	-3.29-32	-8.00-32	-2.32-31	-9.31-31	-8.27-30		
27	-3.07-34	-5.66-34	-1.08-33	-2.11-33	-4.24-33	-8.91-33	-2.00-32	-4.96-32	-1.47-31	-6.01-31	-5.44-30			
26	-2.51-34	-4.95-34	-1.02-33	-2.16-33	-4.76-33	-1.11-32	-2.87-32	-8.73-32	-3.67-31	-3.40-30				
25	-1.61-34	-3.62-34	-8.56-34	-2.09-33	-5.31-33	-1.46-32	-4.69-32	-2.06-31	-1.97-30					
24	-7.00-36	-1.06-34	-4.68-34	-1.65-33	-5.55-33	-2.04-32	-9.81-32	-1.01-30						
23	2.69-34	4.12-34	4.82-34	-1.23-35	-3.63-33	-2.87-32	-3.76-31							
22	7.91-34	1.53-33	2.99-33	6.10-33	1.33-32	1.77-32								
21	1.85-33	4.21-33	1.08-32	3.57-32	2.40-31									
20	4.27-33	1.19-32	4.38-32	3.38-31										
19	1.08-32	4.21-32	3.47-31											
18	3.50-32	3.00-31												
17	2.28-31													

HE + TE = 1.25+04 NE = 1.00+08 CASE B NC = 36

TOTAL RC = 1.373-12 4-3 RC = 2.551-13 4-3 EM = 1.081-24 2S RC = 3.980-13 2P RC = 9.753-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.37-03	1.63-03	6.99-04	3.62-04	2.11-04	1.34-04	9.00-05	6.34-05	4.64-05	3.49-05	2.69-05	2.12-05	1.70-05	1.38-05
45	7.22-03	2.21-03	9.52-04	4.93-04	2.88-04	1.82-04	1.23-04	8.64-05	6.31-05	4.75-05	3.67-05	2.89-05	2.32-05	1.88-05
40	1.01-02	3.10-03	1.33-03	6.90-04	4.03-04	2.55-04	1.72-04	1.21-04	8.84-05	6.65-05	5.13-05	4.04-05	3.24-05	2.64-05
35	1.44-02	4.43-03	1.91-03	9.87-04	5.76-04	3.65-04	2.45-04	1.73-04	1.26-04	9.51-05	7.33-05	5.77-05	4.63-05	3.76-05
30	2.08-02	6.39-03	2.75-03	1.42-03	8.30-04	5.26-04	3.54-04	2.49-04	1.82-04	1.37-04	1.06-04	8.32-05	6.67-05	5.42-05
29	2.24-02	6.86-03	2.95-03	1.53-03	8.92-04	5.65-04	3.80-04	2.68-04	1.96-04	1.47-04	1.14-04	8.94-05	7.16-05	5.82-05
28	2.40-02	7.36-03	3.16-03	1.64-03	9.56-04	6.06-04	4.07-04	2.87-04	2.10-04	1.58-04	1.22-04	9.58-05	7.67-05	6.24-05
27	2.57-02	7.88-03	3.39-03	1.76-03	1.02-03	6.49-04	4.37-04	3.08-04	2.25-04	1.69-04	1.30-04	1.03-04	8.22-05	6.68-05
26	2.74-02	8.43-03	3.62-03	1.88-03	1.10-03	6.94-04	4.67-04	3.29-04	2.41-04	1.81-04	1.40-04	1.10-04	8.79-05	7.14-05
25	2.93-02	9.01-03	3.87-03	2.01-03	1.17-03	7.43-04	5.00-04	3.52-04	2.57-04	1.94-04	1.49-04	1.17-04	9.40-05	7.64-05
24	3.13-02	9.63-03	4.14-03	2.15-03	1.25-03	7.95-04	5.35-04	3.77-04	2.76-04	2.07-04	1.60-04	1.26-04	1.01-04	8.18-05
23	3.36-02	1.03-02	4.44-03	2.31-03	1.35-03	8.54-04	5.75-04	4.05-04	2.96-04	2.23-04	1.72-04	1.35-04	1.08-04	8.78-05
22	3.62-02	1.11-02	4.79-03	2.49-03	1.45-03	9.22-04	6.21-04	4.38-04	3.20-04	2.41-04	1.86-04	1.46-04	1.17-04	9.47-05
21	3.92-02	1.21-02	5.20-03	2.70-03	1.58-03	1.00-03	6.76-04	4.77-04	3.49-04	2.62-04	2.02-04	1.59-04	1.27-04	1.03-04
20	4.29-02	1.32-02	5.71-03	2.97-03	1.74-03	1.10-03	7.44-04	5.25-04	3.84-04	2.89-04	2.23-04	1.75-04	1.40-04	1.13-04
19	4.73-02	1.46-02	6.32-03	3.29-03	1.93-03	1.23-03	8.29-04	5.85-04	4.28-04	3.23-04	2.49-04	1.95-04	1.56-04	1.26-04
18	5.27-02	1.63-02	7.08-03	3.70-03	2.17-03	1.38-03	9.35-04	6.61-04	4.84-04	3.65-04	2.81-04	2.21-04	1.75-04	1.41-04
17	5.91-02	1.84-02	8.01-03	4.20-03	2.47-03	1.58-03	1.07-03	7.58-04	5.56-04	4.19-04	3.23-04	2.53-04	2.00-04	1.58-04
16	6.68-02	2.09-02	9.16-03	4.82-03	2.86-03	1.83-03	1.24-03	8.82-04	6.48-04	4.88-04	3.76-04	2.93-04	2.28-04	1.70-04
15	7.57-02	2.39-02	1.06-02	5.61-03	3.34-03	2.15-03	1.47-03	1.05-03	7.69-04	5.80-04	4.44-04	3.41-04	2.51-04	
14	8.63-02	2.76-02	1.24-02	6.63-03	3.98-03	2.58-03	1.77-03	1.26-03	9.32-04	7.00-04	5.30-04	3.85-04		
13	9.87-02	3.21-02	1.46-02	7.97-03	4.84-03	3.17-03	2.19-03	1.57-03	1.15-03	8.57-04	6.14-04			
12	1.14-01	3.80-02	1.77-02	9.82-03	6.05-03	4.00-03	2.78-03	1.99-03	1.45-03	1.02-03				
11	1.33-01	4.59-02	2.20-02	1.25-02	7.81-03	5.21-03	3.63-03	2.58-03	1.78-03					
10	1.61-01	5.72-02	2.84-02	1.65-02	1.05-02	7.03-03	4.85-03	3.27-03						
9	2.04-01	7.48-02	3.83-02	2.27-02	1.46-02	9.73-03	6.37-03							
8	2.75-01	1.04-01	5.46-02	3.29-02	2.11-02	1.34-02								
7	4.00-01	1.54-01	8.33-02	5.04-02	3.08-02									
6	6.39-01	2.52-01	1.38-01	8.03-02										
5	1.16+00	4.63-01	2.48-01											
4	2.51+00	1.00+00												
3	7.53+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.14-05	9.53-06	8.03-06	6.83-06	5.86-06	5.06-06	4.40-06	3.85-06	3.39-06	3.00-06	2.67-06	2.38-06	2.13-06	1.92-06
45	1.55-05	1.30-05	1.09-05	9.29-06	7.97-06	6.88-06	5.98-06	5.24-06	4.61-06	4.07-06	3.62-06	3.23-06	2.89-06	2.60-06
40	2.17-05	1.81-05	1.53-05	1.30-05	1.11-05	9.61-06	8.35-06	7.30-06	6.42-06	5.68-06	5.04-06	4.49-06	4.02-06	3.61-06
35	3.10-05	2.59-05	2.18-05	1.85-05	1.59-05	1.37-05	1.19-05	1.04-05	9.12-06	8.05-06	7.13-06	6.35-06	5.66-06	5.06-06
30	4.46-05	3.72-05	3.13-05	2.66-05	2.27-05	1.96-05	1.70-05	1.48-05	1.29-05	1.13-05	9.96-06	8.77-06	7.83-06	6.15-06
29	4.79-05	3.99-05	3.36-05	2.85-05	2.44-05	2.10-05	1.82-05	1.58-05	1.38-05	1.20-05	1.05-05	9.03-06	7.35-06	
28	5.14-05	4.28-05	3.60-05	3.05-05	2.61-05	2.24-05	1.94-05	1.68-05	1.46-05	1.27-05	1.09-05	8.81-06		
27	5.50-05	4.58-05	3.85-05	3.26-05	2.78-05	2.39-05	2.06-05	1.78-05	1.54-05	1.31-05	1.06-05			
26	5.88-05	4.89-05	4.11-05	3.48-05	2.97-05	2.54-05	2.19-05	1.88-05	1.59-05	1.28-05				
25	6.28-05	5.23-05	4.39-05	3.71-05	3.16-05	2.69-05	2.30-05	1.94-05	1.55-05					
24	6.72-05	5.58-05	4.68-05	3.95-05	3.35-05	2.84-05	2.38-05	1.89-05						
23	7.21-05	5.98-05	5.00-05	4.21-05	3.54-05	2.95-05	2.33-05							
22	7.77-05	6.43-05	5.36-05	4.48-05	3.71-05	2.91-05								
21	8.43-05	6.96-05	5.76-05	4.73-05	3.69-05									
20	9.23-05	7.57-05	6.17-05	4.77-05										
19	1.02-04	8.21-05	6.30-05											
18	1.12-04	8.53-05												
17	1.19-04													

HE + TE = 1.25+04 NE = 1.00+08 CASE B NC = 36

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.68-38	-1.32-37	-4.36-37	-1.10-36	-2.37-36	-4.63-36	-8.38-36	-1.44-35	-2.36-35	-3.75-35	-5.77-35	-8.64-35	-1.26-34
45	0.00+00	-2.27-38	-1.81-37	-5.97-37	-1.51-36	-3.28-36	-6.42-36	-1.17-35	-2.02-35	-3.35-35	-5.37-35	-8.35-35	-1.27-34	-1.88-34
40	0.00+00	-3.10-38	-2.52-37	-8.39-37	-2.13-36	-4.66-36	-9.20-36	-1.69-35	-2.95-35	-4.95-35	-8.04-35	-1.27-34	-1.96-34	-2.95-34
35	0.00+00	-4.05-38	-3.55-37	-1.19-36	-3.06-36	-6.72-36	-1.34-35	-2.49-35	-4.42-35	-7.54-35	-1.25-34	-2.02-34	-3.20-34	-4.97-34
30	0.00+00	-4.50-38	-4.85-37	-1.66-36	-4.31-36	-9.58-36	-1.93-35	-3.66-35	-6.62-35	-1.16-34	-1.99-34	-3.34-34	-5.52-34	-9.02-34
29	0.00+00	-4.33-38	-5.10-37	-1.76-36	-4.57-36	-1.02-35	-2.06-35	-3.92-35	-7.13-35	-1.26-34	-2.17-34	-3.69-34	-6.17-34	-1.02-33
28	0.00+00	-4.00-38	-5.33-37	-1.85-36	-4.82-36	-1.08-35	-2.19-35	-4.17-35	-7.63-35	-1.36-34	-2.37-34	-4.07-34	-6.91-34	-1.16-33
27	0.00+00	-3.45-38	-5.52-37	-1.94-36	-5.06-36	-1.13-35	-2.30-35	-4.41-35	-8.13-35	-1.46-34	-2.57-34	-4.48-34	-7.73-34	-1.33-33
26	0.00+00	-2.62-38	-5.66-37	-2.01-36	-5.26-36	-1.18-35	-2.41-35	-4.63-35	-8.59-35	-1.56-34	-2.78-34	-4.91-34	-8.64-34	-1.52-33
25	0.00+00	-1.47-38	-5.75-37	-2.07-36	-5.43-36	-1.22-35	-2.49-35	-4.82-35	-8.99-35	-1.65-34	-2.98-34	-5.37-34	-9.65-34	-1.74-33
24	0.00+00	7.49-40	-5.77-37	-2.11-36	-5.56-36	-1.25-35	-2.56-35	-4.96-35	-9.32-35	-1.73-34	-3.18-34	-5.85-34	-1.08-33	-2.01-33
23	0.00+00	2.06-38	-5.72-37	-2.14-36	-5.66-36	-1.27-35	-2.60-35	-5.06-35	-9.58-35	-1.80-34	-3.37-34	-6.36-34	-1.21-33	-2.35-33
22	0.00+00	4.54-38	-5.62-37	-2.16-36	-5.73-36	-1.29-35	-2.63-35	-5.12-35	-9.76-35	-1.86-34	-3.56-34	-6.92-34	-1.37-33	-2.79-33
21	0.00+00	7.59-38	-5.48-37	-2.18-36	-5.80-36	-1.30-35	-2.65-35	-5.15-35	-9.88-35	-1.91-34	-3.76-34	-7.58-34	-1.58-33	-3.42-33
20	0.00+00	1.13-37	-5.29-37	-2.20-36	-5.88-36	-1.31-35	-2.66-35	-5.16-35	-9.95-35	-1.96-34	-3.97-34	-8.40-34	-1.86-33	-4.42-33
19	0.00+00	1.60-37	-5.05-37	-2.22-36	-5.98-36	-1.33-35	-2.67-35	-5.14-35	-9.92-35	-1.99-34	-4.19-34	-9.44-34	-2.29-33	-6.17-33
18	0.00+00	2.20-37	-4.69-37	-2.23-36	-6.07-36	-1.34-35	-2.65-35	-5.03-35	-9.66-35	-1.96-34	-4.36-34	-1.07-33	-2.96-33	-9.78-33
17	0.00+00	2.99-37	-4.12-37	-2.22-36	-6.09-36	-1.33-35	-2.57-35	-4.71-35	-8.77-35	-1.79-34	-4.21-34	-1.18-33	-4.06-33	-1.94-32
16	0.00+00	4.06-37	-3.12-37	-2.12-36	-5.94-36	-1.27-35	-2.33-35	-3.90-35	-6.37-35	-1.17-34	-2.87-34	-1.03-33	-5.58-33	-6.68-32
15	0.00+00	5.56-37	-1.40-37	-1.87-36	-5.41-36	-1.11-35	-1.76-35	-1.98-35	-2.43-36	7.41-35	3.27-34	1.16-33	3.90-33	
14	0.00+00	7.71-37	1.55-37	-1.33-36	-4.15-36	-7.36-36	-5.09-36	2.41-35	1.57-34	7.04-34	3.48-33	3.22-32		
13	0.00+00	1.08-36	6.55-37	-2.77-37	-1.52-36	4.68-37	2.20-35	1.20-34	6.19-34	3.37-33	3.49-32			
12	0.00+00	1.55-36	1.49-36	1.66-36	3.63-36	1.65-35	8.22-35	4.05-34	2.35-33	2.59-32				
11	0.00+00	2.24-36	2.85-36	5.16-36	1.37-35	5.07-35	2.32-34	1.35-33	1.51-32					
10	0.00+00	3.31-36	5.12-36	1.16-35	3.44-35	1.33-34	7.10-34	7.38-33						
9	0.00+00	5.00-36	9.07-36	2.46-35	8.47-35	3.97-34	3.54-33							
8	0.00+00	7.91-36	1.68-35	5.63-35	2.54-34	2.03-33								
7	0.00+00	1.36-35	3.55-35	1.68-34	1.48-33									
6	0.00+00	2.73-35	9.97-35	1.05-33										
5	0.00+00	7.25-35	5.96-34											
4	0.00+00	3.79-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.81-34	-2.53-34	-3.49-34	-4.71-34	-6.25-34	-8.14-34	-1.04-33	-1.30-33	-1.60-33	-1.95-33	-2.33-33	-2.76-33	-3.25-33	-3.81-33
45	-2.72-34	-3.87-34	-5.42-34	-7.47-34	-1.01-33	-1.35-33	-1.76-33	-2.27-33	-2.87-33	-3.60-33	-4.46-33	-5.49-33	-6.74-33	-8.26-33
40	-4.38-34	-6.38-34	-9.16-34	-1.30-33	-1.81-33	-2.50-33	-3.39-33	-4.55-33	-6.04-33	-7.96-33	-1.04-32	-1.37-32	-1.81-32	-2.42-32
35	-7.61-34	-1.15-33	-1.72-33	-2.55-33	-3.75-33	-5.48-33	-7.94-33	-1.15-32	-1.66-32	-2.41-32	-3.54-32	-5.32-32	-8.27-32	-1.35-31
30	-1.46-33	-2.36-33	-3.81-33	-6.15-33	-1.00-32	-1.64-32	-2.74-32	-4.67-32	-8.31-32	-1.57-31	-3.29-31	-8.17-31	-2.80-30	-2.12-29
29	-1.69-33	-2.78-33	-4.58-33	-7.61-33	-1.28-32	-2.18-32	-3.82-32	-6.95-32	-1.34-31	-2.87-31	-7.26-31	-2.53-30	-1.94-29	
28	-1.96-33	-3.30-33	-5.59-33	-9.58-33	-1.67-32	-3.00-32	-5.61-32	-1.11-31	-2.43-31	-6.26-31	-2.22-30	-1.73-29		
27	-2.28-33	-3.95-33	-6.91-33	-1.23-32	-2.27-32	-4.33-32	-8.82-32	-1.97-31	-5.21-31	-1.89-30	-1.50-29			
26	-2.68-33	-4.79-33	-8.72-33	-1.64-32	-3.21-32	-6.69-32	-1.54-31	-4.17-31	-1.55-30	-1.25-29				
25	-3.17-33	-5.90-33	-1.13-32	-2.26-32	-4.83-32	-1.14-31	-3.17-31	-1.21-30	-1.00-29					
24	-3.81-33	-7.44-33	-1.52-32	-3.32-32	-8.02-32	-2.29-31	-8.98-31	-7.67-30						
23	-4.67-33	-9.73-33	-2.17-32	-5.35-32	-1.57-31	-6.31-31	-5.54-30							
22	-5.92-33	-1.34-32	-3.39-32	-1.01-31	-4.18-31	-3.78-30								
21	-7.93-33	-2.04-32	-6.21-32	-2.62-31	-2.42-30									
20	-1.16-32	-3.61-32	-1.55-31	-1.47-30										
19	-1.97-32	-8.65-32	-8.36-31											
18	-4.44-32	-4.41-31												
17	-2.03-31													

HE + TE = 1.25+04 NE = 1.00+09 CASE B NC = 23

TOTAL RC = 1.446-12 4-3 RC = 2.470-13 4-3 EM = 1.047-24 2S RC = 4.292-13 2P RC = 1.016-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.54-03	1.70-03	7.31-04	3.78-04	2.21-04	1.40-04	9.41-05	6.63-05	4.85-05	3.65-05	2.82-05	2.22-05	1.78-05	1.45-05
45	7.62-03	2.34-03	1.00-03	5.20-04	3.03-04	1.92-04	1.29-04	9.11-05	6.66-05	5.02-05	3.87-05	3.05-05	2.44-05	1.99-05
40	1.09-02	3.33-03	1.43-03	7.42-04	4.33-04	2.74-04	1.84-04	1.30-04	9.49-05	7.15-05	5.51-05	4.34-05	3.48-05	2.83-05
35	1.62-02	4.97-03	2.13-03	1.11-03	6.45-04	4.08-04	2.75-04	1.93-04	1.41-04	1.06-04	8.21-05	6.46-05	5.18-05	4.21-05
30	2.54-02	7.79-03	3.35-03	1.73-03	1.01-03	6.39-04	4.30-04	3.03-04	2.21-04	1.66-04	1.28-04	1.01-04	8.09-05	6.57-05
29	2.80-02	8.57-03	3.68-03	1.91-03	1.11-03	7.04-04	4.73-04	3.33-04	2.43-04	1.83-04	1.41-04	1.11-04	8.85-05	7.22-05
28	3.08-02	9.45-03	4.06-03	2.10-03	1.23-03	7.76-04	5.22-04	3.67-04	2.68-04	2.02-04	1.55-04	1.22-04	9.79-05	7.95-05
27	3.40-02	1.04-02	4.48-03	2.32-03	1.35-03	8.56-04	5.76-04	4.05-04	2.96-04	2.23-04	1.72-04	1.35-04	1.08-04	8.77-05
26	3.76-02	1.15-02	4.96-03	2.57-03	1.50-03	9.46-04	6.36-04	4.48-04	3.27-04	2.46-04	1.89-04	1.49-04	1.19-04	9.68-05
25	4.16-02	1.28-02	5.48-03	2.84-03	1.65-03	1.05-03	7.03-04	4.95-04	3.61-04	2.72-04	2.09-04	1.65-04	1.32-04	1.07-04
24	4.61-02	1.41-02	6.06-03	3.14-03	1.83-03	1.16-03	7.78-04	5.47-04	3.99-04	3.00-04	2.31-04	1.82-04	1.45-04	1.18-04
23	5.05-02	1.55-02	6.66-03	3.45-03	2.01-03	1.27-03	8.54-04	6.01-04	4.39-04	3.30-04	2.54-04	2.00-04	1.59-04	1.29-04
22	5.57-02	1.71-02	7.33-03	3.80-03	2.21-03	1.40-03	9.41-04	6.62-04	4.83-04	3.63-04	2.79-04	2.19-04	1.75-04	1.42-04
21	6.11-02	1.87-02	8.05-03	4.17-03	2.43-03	1.54-03	1.03-03	7.26-04	5.30-04	3.98-04	3.06-04	2.40-04	1.92-04	1.55-04
20	6.68-02	2.05-02	8.80-03	4.56-03	2.66-03	1.68-03	1.13-03	7.94-04	5.79-04	4.35-04	3.34-04	2.62-04	2.09-04	1.68-04
19	7.27-02	2.23-02	9.58-03	4.96-03	2.89-03	1.83-03	1.23-03	8.64-04	6.30-04	4.73-04	3.63-04	2.84-04	2.26-04	1.82-04
18	7.89-02	2.42-02	1.04-02	5.39-03	3.14-03	1.99-03	1.34-03	9.39-04	6.84-04	5.13-04	3.94-04	3.08-04	2.44-04	1.95-04
17	8.58-02	2.64-02	1.13-02	5.87-03	3.42-03	2.17-03	1.45-03	1.02-03	7.45-04	5.58-04	4.27-04	3.33-04	2.62-04	2.06-04
16	9.41-02	2.89-02	1.24-02	6.45-03	3.76-03	2.38-03	1.60-03	1.12-03	8.17-04	6.11-04	4.67-04	3.61-04	2.79-04	2.07-04
15	1.05-01	3.22-02	1.39-02	7.19-03	4.20-03	2.66-03	1.79-03	1.25-03	9.11-04	6.79-04	5.15-04	3.92-04	2.86-04	
14	1.19-01	3.65-02	1.58-02	8.20-03	4.79-03	3.03-03	2.04-03	1.43-03	1.04-03	7.69-04	5.74-04	4.12-04		
13	1.37-01	4.23-02	1.83-02	9.55-03	5.59-03	3.55-03	2.39-03	1.67-03	1.21-03	8.80-04	6.20-04			
12	1.61-01	5.00-02	2.18-02	1.14-02	6.70-03	4.26-03	2.86-03	2.00-03	1.42-03	9.83-04				
11	1.92-01	6.02-02	2.65-02	1.40-02	8.26-03	5.27-03	3.54-03	2.45-03	1.65-03					
10	2.32-01	7.40-02	3.30-02	1.77-02	1.05-02	6.75-03	4.50-03	2.96-03						
9	2.87-01	9.35-02	4.28-02	2.33-02	1.40-02	8.99-03	5.73-03							
8	3.66-01	1.23-01	5.83-02	3.25-02	1.97-02	1.21-02								
7	4.97-01	1.74-01	8.55-02	4.84-02	2.84-02									
6	7.46-01	2.71-01	1.37-01	7.56-02										
5	1.29+00	4.82-01	2.40-01											
4	2.74+00	1.00+00												
3	7.96+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.19-05	9.96-06	8.40-06	7.14-06	6.13-06	5.29-06	4.60-06	4.03-06	3.55-06	3.14-06	2.79-06	2.49-06	2.23-06	2.01-06
45	1.64-05	1.37-05	1.15-05	9.80-06	8.41-06	7.26-06	6.32-06	5.53-06	4.86-06	4.30-06	3.82-06	3.41-06	3.05-06	2.75-06
40	2.33-05	1.95-05	1.64-05	1.39-05	1.20-05	1.03-05	8.97-06	7.85-06	6.90-06	6.10-06	5.41-06	4.83-06	4.32-06	3.88-06
35	3.47-05	2.89-05	2.44-05	2.07-05	1.77-05	1.53-05	1.33-05	1.16-05	1.02-05	9.00-06	7.97-06	7.09-06	6.32-06	5.65-06
30	5.41-05	4.51-05	3.79-05	3.22-05	2.75-05	2.37-05	2.05-05	1.79-05	1.56-05	1.37-05	1.20-05	1.05-05	9.09-06	7.41-06
29	5.95-05	4.95-05	4.16-05	3.53-05	3.02-05	2.60-05	2.25-05	1.96-05	1.71-05	1.49-05	1.30-05	1.12-05	9.06-06	
28	6.55-05	5.45-05	4.58-05	3.88-05	3.32-05	2.85-05	2.46-05	2.14-05	1.86-05	1.61-05	1.38-05	1.11-05		
27	7.22-05	6.00-05	5.04-05	4.27-05	3.64-05	3.13-05	2.70-05	2.33-05	2.01-05	1.71-05	1.38-05			
26	7.96-05	6.62-05	5.55-05	4.70-05	4.00-05	3.43-05	2.94-05	2.52-05	2.14-05	1.71-05				
25	8.78-05	7.29-05	6.11-05	5.16-05	4.39-05	3.74-05	3.19-05	2.69-05	2.14-05					
24	9.67-05	8.02-05	6.72-05	5.66-05	4.79-05	4.06-05	3.40-05	2.69-05						
23	1.06-04	8.79-05	7.35-05	6.17-05	5.19-05	4.32-05	3.40-05							
22	1.16-04	9.61-05	8.00-05	6.67-05	5.51-05	4.32-05								
21	1.27-04	1.04-04	8.63-05	7.07-05	5.50-05									
20	1.37-04	1.12-04	9.12-05	7.04-05										
19	1.47-04	1.18-04	9.05-05											
18	1.55-04	1.17-04												
17	1.54-04													

HE + TE = 1.25+04 NE = 1.00+09 CASE B NC = 23

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.57-38	-1.34-37	-4.48-37	-1.14-36	-2.48-36	-4.86-36	-8.82-36	-1.51-35	-2.44-35	-3.79-35	-5.67-35	-8.15-35	-1.13-34
45	0.00+00	-2.18-38	-1.86-37	-6.23-37	-1.59-36	-3.48-36	-6.86-36	-1.25-35	-2.15-35	-3.53-35	-5.53-35	-8.35-35	-1.22-34	-1.70-34
40	0.00+00	-3.15-38	-2.67-37	-9.01-37	-2.31-36	-5.10-36	-1.01-35	-1.87-35	-3.25-35	-5.38-35	-8.57-35	-1.31-34	-1.95-34	-2.78-34
35	0.00+00	-4.72-38	-4.03-37	-1.37-36	-3.54-36	-7.88-36	-1.59-35	-2.97-35	-5.24-35	-8.86-35	-1.44-34	-2.26-34	-3.44-34	-5.07-34
30	0.00+00	-7.29-38	-6.39-37	-2.19-36	-5.76-36	-1.30-35	-2.67-35	-5.10-35	-9.26-35	-1.61-34	-2.71-34	-4.43-34	-7.05-34	-1.09-33
29	0.00+00	-7.95-38	-7.05-37	-2.43-36	-6.39-36	-1.45-35	-2.99-35	-5.75-35	-1.05-34	-1.84-34	-3.13-34	-5.17-34	-8.34-34	-1.31-33
28	0.00+00	-8.65-38	-7.78-37	-2.69-36	-7.11-36	-1.62-35	-3.36-35	-6.50-35	-1.20-34	-2.12-34	-3.64-34	-6.09-34	-9.97-34	-1.59-33
27	0.00+00	-9.38-38	-8.59-37	-2.98-36	-7.92-36	-1.81-35	-3.78-35	-7.38-35	-1.37-34	-2.45-34	-4.27-34	-7.24-34	-1.20-33	-1.96-33
26	0.00+00	-1.01-37	-9.48-37	-3.31-36	-8.83-36	-2.03-35	-4.27-35	-8.40-35	-1.58-34	-2.86-34	-5.04-34	-8.69-34	-1.47-33	-2.46-33
25	0.00+00	-1.08-37	-1.05-36	-3.67-36	-9.85-36	-2.28-35	-4.83-35	-9.59-35	-1.82-34	-3.35-34	-5.99-34	-1.05-33	-1.83-33	-3.14-33
24	0.00+00	-1.13-37	-1.15-36	-4.07-36	-1.10-35	-2.56-35	-5.47-35	-1.10-34	-2.11-34	-3.94-34	-7.19-34	-1.29-33	-2.31-33	-4.09-33
23	0.00+00	-1.12-37	-1.24-36	-4.44-36	-1.21-35	-2.84-35	-6.13-35	-1.25-34	-2.43-34	-4.62-34	-8.63-34	-1.60-33	-2.94-33	-5.42-33
22	0.00+00	-1.09-37	-1.35-36	-4.86-36	-1.33-35	-3.17-35	-6.90-35	-1.42-34	-2.83-34	-5.49-34	-1.05-33	-2.01-33	-3.86-33	-7.49-33
21	0.00+00	-9.90-38	-1.44-36	-5.28-36	-1.46-35	-3.50-35	-7.73-35	-1.62-34	-3.29-34	-6.55-34	-1.30-33	-2.58-33	-5.20-33	-1.08-32
20	0.00+00	-7.78-38	-1.52-36	-5.66-36	-1.58-35	-3.84-35	-8.60-35	-1.84-34	-3.82-34	-7.85-34	-1.62-33	-3.37-33	-7.27-33	-1.65-32
19	0.00+00	-4.13-38	-1.57-36	-5.99-36	-1.69-35	-4.16-35	-9.47-35	-2.07-34	-4.43-34	-9.46-34	-2.04-33	-4.55-33	-1.07-32	-2.75-32
18	0.00+00	1.50-38	-1.58-36	-6.22-36	-1.79-35	-4.45-35	-1.03-34	-2.31-34	-5.14-34	-1.15-33	-2.64-33	-6.42-33	-1.71-32	-5.34-32
17	0.00+00	9.56-38	-1.55-36	-6.37-36	-1.86-35	-4.71-35	-1.12-34	-2.58-34	-5.99-34	-1.42-33	-3.56-33	-9.79-33	-3.17-32	-1.39-31
16	0.00+00	2.05-37	-1.48-36	-6.47-36	-1.93-35	-4.96-35	-1.21-34	-2.90-34	-7.12-34	-1.83-33	-5.18-33	-1.72-32	-7.84-32	-7.77-31
15	0.00+00	3.50-37	-1.38-36	-6.56-36	-2.00-35	-5.26-35	-1.32-34	-3.33-34	-8.83-34	-2.56-33	-8.70-33	-4.06-32	-4.14-31	
14	0.00+00	5.45-37	-1.25-36	-6.69-36	-2.10-35	-5.67-35	-1.48-34	-3.99-34	-1.18-33	-4.11-33	-1.96-32	-2.04-31		
13	0.00+00	8.16-37	-1.06-36	-6.82-36	-2.23-35	-6.21-35	-1.70-34	-5.06-34	-1.79-33	-8.70-33	-9.27-32			
12	0.00+00	1.21-36	-7.02-37	-6.76-36	-2.35-35	-6.78-35	-1.98-34	-6.83-34	-3.32-33	-3.61-32				
11	0.00+00	1.84-36	1.84-39	-6.05-36	-2.31-35	-6.87-35	-2.13-34	-9.21-34	-9.54-33					
10	0.00+00	2.85-36	1.47-36	-3.45-36	-1.67-35	-4.21-35	-5.29-35	6.47-34						
9	0.00+00	4.61-36	4.60-36	4.30-36	1.20-35	1.45-34	2.77-33							
8	0.00+00	7.83-36	1.16-35	2.78-35	1.44-34	2.09-33								
7	0.00+00	1.42-35	2.92-35	1.16-34	1.26-33									
6	0.00+00	2.90-35	8.80-35	7.98-34										
5	0.00+00	7.62-35	5.12-34											
4	0.00+00	3.87-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.49-34	-1.89-34	-2.31-34	-2.70-34	-3.06-34	-3.38-34	-3.64-34	-3.85-34	-3.92-34	-3.99-34	-3.99-34	-3.90-34	-3.71-34	-3.40-34
45	-2.29-34	-2.96-34	-3.67-34	-4.38-34	-5.09-34	-5.76-34	-6.39-34	-6.99-34	-7.39-34	-7.66-34	-8.28-34	-8.62-34	-8.87-34	-8.96-34
40	-3.82-34	-5.06-34	-6.44-34	-7.94-34	-9.54-34	-1.12-33	-1.30-33	-1.49-33	-1.67-33	-1.90-33	-2.16-33	-2.46-33	-2.81-33	-3.23-33
35	-7.21-34	-9.91-34	-1.32-33	-1.71-33	-2.16-33	-2.71-33	-3.37-33	-4.21-33	-5.19-33	-6.59-33	-8.55-33	-1.14-32	-1.58-32	-2.32-32
30	-1.65-33	-2.42-33	-3.48-33	-4.92-33	-6.92-33	-9.79-33	-1.41-32	-2.09-32	-3.22-32	-5.39-32	-1.01-31	-2.27-31	-7.13-31	-4.98-30
29	-2.01-33	-3.02-33	-4.43-33	-6.45-33	-9.36-33	-1.38-32	-2.08-32	-3.30-32	-5.53-32	-1.05-31	-2.38-31	-7.54-31	-5.31-30	
28	-2.50-33	-3.83-33	-5.78-33	-8.68-33	-1.31-32	-2.03-32	-3.27-32	-5.65-32	-1.07-31	-2.46-31	-7.86-31	-5.57-30		
27	-3.15-33	-4.96-33	-7.73-33	-1.21-32	-1.92-32	-3.16-32	-5.56-32	-1.09-31	-2.50-31	-8.05-31	-5.77-30			
26	-4.05-33	-6.59-33	-1.07-32	-1.76-32	-2.98-32	-5.34-32	-1.06-31	-2.51-31	-8.12-31	-5.86-30				
25	-5.33-33	-9.04-33	-1.54-32	-2.70-32	-4.99-32	-1.01-31	-2.43-31	-8.05-31	-5.87-30					
24	-7.24-33	-1.29-32	-2.35-32	-4.48-32	-9.34-32	-2.29-31	-7.71-31	-5.64-30						
23	-1.01-32	-1.92-32	-3.81-32	-8.21-32	-2.07-31	-7.12-31	-5.36-30							
22	-1.49-32	-3.09-32	-6.93-32	-1.81-31	-6.41-31	-4.94-30								
21	-2.34-32	-5.50-32	-1.50-31	-5.49-31	-4.36-30									
20	-4.05-32	-1.15-31	-4.43-31	-3.65-30										
19	-8.22-32	-3.30-31	-2.84-30											
18	-2.25-31	-2.04-30												
17	-1.33-30													

HE + TE = 1.25+04 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 1.584-12 4-3 RC = 2.446-13 4-3 EM = 1.037-24 2S RC = 4.836-13 2P RC = 1.101-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.61-03	1.72-03	7.39-04	3.83-04	2.23-04	1.41-04	9.52-05	6.71-05	4.91-05	3.69-05	2.85-05	2.25-05	1.80-05	1.47-05
45	7.72-03	2.37-03	1.02-03	5.27-04	3.08-04	1.95-04	1.31-04	9.24-05	6.75-05	5.09-05	3.92-05	3.09-05	2.48-05	2.02-05
40	1.11-02	3.39-03	1.46-03	7.55-04	4.40-04	2.79-04	1.88-04	1.32-04	9.66-05	7.27-05	5.61-05	4.42-05	3.54-05	2.88-05
35	1.66-02	5.10-03	2.19-03	1.14-03	6.62-04	4.19-04	2.82-04	1.99-04	1.45-04	1.09-04	8.43-05	6.63-05	5.31-05	4.32-05
30	2.67-02	8.17-03	3.51-03	1.82-03	1.06-03	6.71-04	4.51-04	3.18-04	2.32-04	1.75-04	1.35-04	1.06-04	8.48-05	6.90-05
29	2.96-02	9.07-03	3.89-03	2.02-03	1.18-03	7.44-04	5.00-04	3.52-04	2.57-04	1.94-04	1.49-04	1.17-04	9.40-05	7.64-05
28	3.29-02	1.01-02	4.33-03	2.24-03	1.31-03	8.28-04	5.57-04	3.92-04	2.86-04	2.15-04	1.66-04	1.31-04	1.04-04	8.49-05
27	3.67-02	1.13-02	4.84-03	2.51-03	1.46-03	9.24-04	6.21-04	4.38-04	3.19-04	2.40-04	1.85-04	1.46-04	1.17-04	9.47-05
26	4.12-02	1.26-02	5.43-03	2.81-03	1.64-03	1.04-03	6.96-04	4.90-04	3.58-04	2.69-04	2.07-04	1.63-04	1.30-04	1.06-04
25	4.64-02	1.42-02	6.11-03	3.16-03	1.84-03	1.17-03	7.84-04	5.51-04	4.03-04	3.03-04	2.33-04	1.83-04	1.47-04	1.19-04
24	5.24-02	1.61-02	6.90-03	3.57-03	2.08-03	1.32-03	8.85-04	6.23-04	4.55-04	3.42-04	2.63-04	2.07-04	1.65-04	1.34-04
23	5.95-02	1.82-02	7.83-03	4.05-03	2.36-03	1.49-03	1.00-03	7.06-04	5.15-04	3.87-04	2.98-04	2.34-04	1.87-04	1.51-04
22	6.78-02	2.08-02	8.92-03	4.61-03	2.69-03	1.70-03	1.14-03	8.03-04	5.86-04	4.40-04	3.39-04	2.66-04	2.12-04	1.72-04
21	7.75-02	2.37-02	1.02-02	5.27-03	3.07-03	1.94-03	1.30-03	9.17-04	6.69-04	5.02-04	3.86-04	3.03-04	2.41-04	1.95-04
20	8.85-02	2.71-02	1.16-02	6.03-03	3.51-03	2.22-03	1.49-03	1.05-03	7.64-04	5.73-04	4.40-04	3.45-04	2.75-04	2.21-04
19	1.02-01	3.11-02	1.34-02	6.91-03	4.02-03	2.54-03	1.71-03	1.20-03	8.74-04	6.55-04	5.03-04	3.94-04	3.13-04	2.51-04
18	1.17-01	3.57-02	1.53-02	7.92-03	4.61-03	2.92-03	1.96-03	1.37-03	1.00-03	7.49-04	5.74-04	4.48-04	3.55-04	2.83-04
17	1.33-01	4.08-02	1.75-02	9.06-03	5.27-03	3.33-03	2.23-03	1.57-03	1.14-03	8.53-04	6.52-04	5.07-04	3.98-04	3.12-04
16	1.52-01	4.64-02	1.99-02	1.03-02	5.99-03	3.78-03	2.53-03	1.78-03	1.29-03	9.63-04	7.34-04	5.66-04	4.37-04	3.23-04
15	1.71-01	5.22-02	2.24-02	1.16-02	6.74-03	4.25-03	2.85-03	1.99-03	1.44-03	1.07-03	8.12-04	6.16-04	4.48-04	
14	1.90-01	5.81-02	2.49-02	1.29-02	7.49-03	4.72-03	3.16-03	2.21-03	1.59-03	1.18-03	8.75-04	6.25-04		
13	2.10-01	6.42-02	2.75-02	1.42-02	8.27-03	5.21-03	3.48-03	2.42-03	1.74-03	1.26-03	8.83-04			
12	2.33-01	7.14-02	3.06-02	1.58-02	9.18-03	5.78-03	3.84-03	2.66-03	1.88-03	1.28-03				
11	2.65-01	8.14-02	3.50-02	1.81-02	1.05-02	6.58-03	4.35-03	2.96-03	1.97-03					
10	3.14-01	9.67-02	4.16-02	2.15-02	1.25-02	7.78-03	5.07-03	3.26-03						
9	3.88-01	1.20-01	5.17-02	2.68-02	1.55-02	9.56-03	5.90-03							
8	4.97-01	1.55-01	6.73-02	3.50-02	2.01-02	1.18-02								
7	6.65-01	2.10-01	9.30-02	4.86-02	2.68-02									
6	9.55-01	3.09-01	1.40-01	7.12-02										
5	1.55+00	5.13-01	2.30-01											
4	3.08+00	1.00+00												
3	8.51+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.21-05	1.01-05	8.50-06	7.23-06	6.20-06	5.36-06	4.66-06	4.08-06	3.59-06	3.17-06	2.82-06	2.52-06	2.26-06	2.03-06
45	1.66-05	1.39-05	1.17-05	9.94-06	8.52-06	7.36-06	6.40-06	5.60-06	4.93-06	4.36-06	3.87-06	3.46-06	3.10-06	2.78-06
40	2.38-05	1.98-05	1.67-05	1.42-05	1.22-05	1.05-05	9.13-06	7.99-06	7.02-06	6.21-06	5.51-06	4.91-06	4.40-06	3.95-06
35	3.56-05	2.97-05	2.50-05	2.13-05	1.82-05	1.57-05	1.36-05	1.19-05	1.05-05	9.24-06	8.19-06	7.28-06	6.49-06	5.81-06
30	5.68-05	4.73-05	3.98-05	3.38-05	2.89-05	2.49-05	2.16-05	1.88-05	1.64-05	1.44-05	1.26-05	1.10-05	9.53-06	7.77-06
29	6.29-05	5.24-05	4.40-05	3.74-05	3.19-05	2.75-05	2.38-05	2.07-05	1.80-05	1.57-05	1.37-05	1.18-05	9.58-06	
28	6.99-05	5.82-05	4.89-05	4.14-05	3.54-05	3.04-05	2.63-05	2.28-05	1.98-05	1.72-05	1.47-05	1.19-05		
27	7.79-05	6.48-05	5.44-05	4.61-05	3.93-05	3.38-05	2.91-05	2.51-05	2.17-05	1.85-05	1.49-05			
26	8.71-05	7.24-05	6.08-05	5.14-05	4.38-05	3.75-05	3.22-05	2.76-05	2.34-05	1.88-05				
25	9.77-05	8.12-05	6.81-05	5.75-05	4.89-05	4.17-05	3.55-05	2.99-05	2.39-05					
24	1.10-04	9.13-05	7.65-05	6.44-05	5.45-05	4.62-05	3.87-05	3.07-05						
23	1.24-04	1.03-04	8.60-05	7.22-05	6.07-05	5.05-05	3.98-05							
22	1.41-04	1.16-04	9.67-05	8.06-05	6.65-05	5.21-05								
21	1.59-04	1.31-04	1.08-04	8.87-05	6.89-05									
20	1.80-04	1.47-04	1.20-04	9.22-05										
19	2.03-04	1.63-04	1.25-04											
18	2.25-04	1.70-04												
17	2.33-04													

HE + TE = 1.25+04 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.30-32	-1.45-38	-1.34-37	-4.50-37	-1.13-36	-2.43-36	-4.68-36	-8.24-36	-1.34-35	-2.03-35	-2.81-35	-3.52-35	-3.99-35	-4.09-35
45	8.65-32	-2.02-38	-1.87-37	-6.27-37	-1.59-36	-3.42-36	-6.62-36	-1.18-35	-1.93-35	-2.95-35	-4.12-35	-5.24-35	-6.03-35	-6.31-35
40	1.23-31	-2.95-38	-2.71-37	-9.12-37	-2.32-36	-5.05-36	-9.85-36	-1.77-35	-2.94-35	-4.54-35	-6.45-35	-8.35-35	-9.84-35	-1.06-34
35	1.85-31	-4.56-38	-4.14-37	-1.40-36	-3.60-36	-7.92-36	-1.56-35	-2.85-35	-4.82-35	-7.60-35	-1.11-34	-1.47-34	-1.80-34	-2.02-34
30	2.95-31	-7.56-38	-6.80-37	-2.33-36	-6.06-36	-1.35-35	-2.73-35	-5.09-35	-8.85-35	-1.44-34	-2.18-34	-3.04-34	-3.91-34	-4.70-34
29	3.27-31	-8.45-38	-7.59-37	-2.60-36	-6.80-36	-1.53-35	-3.09-35	-5.80-35	-1.02-34	-1.67-34	-2.56-34	-3.61-34	-4.71-34	-5.77-34
28	3.62-31	-9.48-38	-8.51-37	-2.93-36	-7.67-36	-1.73-35	-3.53-35	-6.67-35	-1.18-34	-1.96-34	-3.03-34	-4.33-34	-5.76-34	-7.19-34
27	4.06-31	-1.06-37	-9.57-37	-3.30-36	-8.70-36	-1.97-35	-4.05-35	-7.72-35	-1.38-34	-2.31-34	-3.62-34	-5.27-34	-7.14-34	-9.13-34
26	4.95-31	-1.21-37	-1.08-36	-3.75-36	-9.92-36	-2.26-35	-4.69-35	-9.00-35	-1.63-34	-2.76-34	-4.39-34	-6.51-34	-9.01-34	-1.18-33
25	5.13-31	-1.37-37	-1.23-36	-4.27-36	-1.14-35	-2.61-35	-5.46-35	-1.06-34	-1.94-34	-3.34-34	-5.41-34	-8.18-34	-1.16-33	-1.58-33
24	5.81-31	-1.55-37	-1.40-36	-4.90-36	-1.31-35	-3.04-35	-6.41-35	-1.26-34	-2.33-34	-4.09-34	-6.76-34	-1.05-33	-1.53-33	-2.16-33
23	6.62-31	-1.77-37	-1.60-36	-5.64-36	-1.52-35	-3.56-35	-7.59-35	-1.51-34	-2.85-34	-5.10-34	-8.62-34	-1.38-33	-2.09-33	-3.07-33
22	7.59-31	-2.02-37	-1.84-36	-6.53-36	-1.78-35	-4.20-35	-9.07-35	-1.84-34	-3.53-34	-6.46-34	-1.12-33	-1.86-33	-2.94-33	-4.57-33
21	8.75-31	-2.30-37	-2.13-36	-7.60-36	-2.09-35	-5.00-35	-1.10-34	-2.26-34	-4.44-34	-8.36-34	-1.50-33	-2.59-33	-4.33-33	-7.21-33
20	1.02-30	-2.58-37	-2.46-36	-8.85-36	-2.46-35	-5.97-35	-1.33-34	-2.81-34	-5.67-34	-1.10-33	-2.07-33	-3.76-33	-6.72-33	-1.23-32
19	1.19-30	-2.89-37	-2.84-36	-1.04-35	-2.92-35	-7.20-35	-1.64-34	-3.55-34	-7.41-34	-1.50-33	-2.97-33	-5.78-33	-1.13-32	-2.34-32
18	1.41-30	-3.16-37	-3.28-36	-1.21-35	-3.47-35	-8.73-35	-2.04-34	-4.56-34	-9.91-34	-2.12-33	-4.48-33	-9.54-33	-2.12-32	-5.36-32
17	1.68-30	-3.31-37	-3.75-36	-1.41-35	-4.12-35	-1.06-34	-2.56-34	-5.95-34	-1.36-33	-3.11-33	-7.22-33	-1.75-32	-4.74-32	-1.69-31
16	2.03-30	-3.21-37	-4.23-36	-1.63-35	-4.87-35	-1.29-34	-3.23-34	-7.89-34	-1.93-33	-4.84-33	-1.28-32	-3.77-32	-1.45-31	-1.16-30
15	2.48-30	-2.63-37	-4.66-36	-1.86-35	-5.69-35	-1.56-34	-4.10-34	-1.07-33	-2.86-33	-8.14-33	-2.62-32	-1.10-31	-9.53-31	
14	3.08-30	-1.25-37	-4.94-36	-2.06-35	-6.52-35	-1.87-34	-5.22-34	-1.48-33	-4.50-33	-1.56-32	-7.17-32	-6.81-31		
13	3.90-30	1.30-37	-5.01-36	-2.22-35	-7.34-35	-2.23-34	-6.73-34	-2.16-33	-7.96-33	-3.93-32	-4.08-31			
12	5.04-30	5.38-37	-4.85-36	-2.35-35	-8.24-35	-2.69-34	-9.10-34	-3.51-33	-1.82-32	-2.03-31				
11	6.68-30	1.15-36	-4.55-36	-2.53-35	-9.54-35	-3.45-34	-1.39-33	-7.50-33	-8.69-32					
10	9.14-30	2.08-36	-4.09-36	-2.82-35	-1.19-34	-5.07-34	-2.82-33	-3.35-32						
9	1.30-29	3.64-36	-3.11-36	-3.28-35	-1.64-34	-9.48-34	-1.15-32							
8	1.95-29	6.54-36	-2.98-37	-3.75-35	-2.56-34	-3.02-33								
7	3.15-29	1.27-35	9.19-36	-2.51-35	-3.17-34									
6	5.66-29	2.80-35	4.90-35	2.91-34										
5	1.21-28	7.80-35	3.65-34											
4	3.62-28	3.97-34												
3	2.63-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-3.76-35	-3.00-35	-1.80-35	-1.52-36	1.99-35	4.84-35	8.19-35	1.23-34	1.74-34	2.36-34	3.13-34	4.08-34	5.27-34	6.75-34
45	-5.97-35	-5.00-35	-3.33-35	-9.40-36	2.28-35	6.74-35	1.22-34	1.91-34	2.79-34	3.92-34	5.38-34	7.27-34	9.75-34	1.30-33
40	-1.04-34	-9.26-35	-6.96-35	-3.36-35	1.78-35	9.39-35	1.91-34	3.23-34	5.03-34	7.48-34	1.09-33	1.57-33	2.26-33	3.26-33
35	-2.10-34	-2.02-34	-1.74-34	-1.20-34	-3.37-35	1.11-34	3.16-34	6.25-34	1.10-33	1.84-33	3.02-33	5.00-33	8.47-33	1.50-32
30	-5.33-34	-5.74-34	-5.84-34	-5.45-34	-4.29-34	-1.36-34	3.90-34	1.44-33	3.60-33	8.41-33	2.04-32	5.70-32	2.16-31	1.79-30
29	-6.70-34	-7.43-34	-7.86-34	-7.79-34	-6.86-34	-3.71-34	2.62-34	1.69-33	5.03-33	1.37-32	4.10-32	1.62-31	1.38-30	
28	-8.57-34	-9.82-34	-1.08-33	-1.15-33	-1.12-33	-8.25-34	-1.02-34	1.86-33	7.43-33	2.60-32	1.12-31	1.00-30		
27	-1.12-33	-1.33-33	-1.54-33	-1.75-33	-1.90-33	-1.75-33	-1.09-33	1.53-33	1.18-32	6.47-32	6.56-31			
26	-1.50-33	-1.86-33	-2.28-33	-2.78-33	-3.38-33	-3.82-33	-3.97-33	-1.45-33	2.00-32	3.19-31				
25	-2.08-33	-2.71-33	-3.54-33	-4.71-33	-6.48-33	-9.00-33	-1.37-32	-2.15-32	7.40-33					
24	-2.98-33	-4.12-33	-5.83-33	-8.64-33	-1.39-32	-2.49-32	-5.97-32	-2.82-31						
23	-4.48-33	-6.67-33	-1.04-32	-1.78-32	-3.56-32	-9.42-32	-5.47-31							
22	-7.16-33	-1.17-32	-2.10-32	-4.41-32	-1.27-31	-7.83-31								
21	-1.24-32	-2.32-32	-5.08-32	-1.52-31	-9.85-31									
20	-2.40-32	-5.45-32	-1.69-31	-1.14-30										
19	-5.59-32	-1.80-31	-1.26-30											
18	-1.81-31	-1.31-30												
17	-1.28-30													

HE + TE = 1.25+04 NE = 1.00+11 CASE B NC = 20

TOTAL RC = 1.860-12 4-3 RC = 2.661-13 4-3 EM = 1.128-24 2S RC = 5.492-13 2P RC = 1.310-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.16-03	1.58-03	6.80-04	3.52-04	2.05-04	1.30-04	8.76-05	6.17-05	4.51-05	3.40-05	2.62-05	2.07-05	1.66-05	1.35-05
45	7.11-03	2.18-03	9.37-04	4.85-04	2.83-04	1.79-04	1.21-04	8.50-05	6.21-05	4.68-05	3.61-05	2.84-05	2.28-05	1.86-05
40	1.02-02	3.12-03	1.34-03	6.95-04	4.06-04	2.57-04	1.73-04	1.22-04	8.90-05	6.70-05	5.17-05	4.07-05	3.26-05	2.65-05
35	1.53-02	4.71-03	2.02-03	1.05-03	6.11-04	3.87-04	2.60-04	1.83-04	1.34-04	1.01-04	7.77-05	6.12-05	4.90-05	3.99-05
30	2.47-02	7.57-03	3.25-03	1.68-03	9.82-04	6.22-04	4.18-04	2.94-04	2.15-04	1.62-04	1.25-04	9.82-05	7.86-05	6.39-05
29	2.74-02	8.41-03	3.61-03	1.87-03	1.09-03	6.90-04	4.64-04	3.27-04	2.39-04	1.80-04	1.38-04	1.09-04	8.72-05	7.09-05
28	3.06-02	9.38-03	4.03-03	2.09-03	1.22-03	7.70-04	5.18-04	3.64-04	2.66-04	2.00-04	1.54-04	1.21-04	9.72-05	7.89-05
27	3.43-02	1.05-02	4.51-03	2.34-03	1.36-03	8.62-04	5.79-04	4.08-04	2.98-04	2.24-04	1.73-04	1.36-04	1.09-04	8.83-05
26	3.85-02	1.18-02	5.08-03	2.63-03	1.53-03	9.69-04	6.51-04	4.59-04	3.35-04	2.52-04	1.94-04	1.53-04	1.22-04	9.91-05
25	4.36-02	1.34-02	5.74-03	2.97-03	1.73-03	1.10-03	7.36-04	5.18-04	3.78-04	2.84-04	2.19-04	1.72-04	1.38-04	1.12-04
24	4.95-02	1.52-02	6.52-03	3.37-03	1.97-03	1.24-03	8.36-04	5.88-04	4.29-04	3.23-04	2.48-04	1.95-04	1.56-04	1.27-04
23	5.66-02	1.73-02	7.45-03	3.85-03	2.25-03	1.42-03	9.55-04	6.72-04	4.90-04	3.68-04	2.83-04	2.23-04	1.78-04	1.44-04
22	6.51-02	1.99-02	8.56-03	4.43-03	2.58-03	1.63-03	1.10-03	7.71-04	5.63-04	4.23-04	3.25-04	2.55-04	2.04-04	1.65-04
21	7.53-02	2.31-02	9.91-03	5.13-03	2.99-03	1.89-03	1.27-03	8.92-04	6.50-04	4.88-04	3.75-04	2.94-04	2.35-04	1.90-04
20	8.77-02	2.69-02	1.15-02	5.97-03	3.48-03	2.20-03	1.48-03	1.04-03	7.56-04	5.67-04	4.36-04	3.41-04	2.72-04	2.19-04
19	1.03-01	3.16-02	1.35-02	7.01-03	4.08-03	2.58-03	1.73-03	1.22-03	8.85-04	6.64-04	5.09-04	3.98-04	3.16-04	2.54-04
18	1.22-01	3.74-02	1.60-02	8.29-03	4.82-03	3.05-03	2.04-03	1.44-03	1.04-03	7.82-04	5.99-04	4.68-04	3.70-04	2.95-04
17	1.45-01	4.45-02	1.91-02	9.87-03	5.75-03	3.63-03	2.43-03	1.71-03	1.24-03	9.28-04	7.09-04	5.51-04	4.33-04	3.39-04
16	1.75-01	5.35-02	2.29-02	1.19-02	6.89-03	4.35-03	2.91-03	2.04-03	1.48-03	1.11-03	8.42-04	6.50-04	5.01-04	3.70-04
15	2.11-01	6.47-02	2.77-02	1.43-02	8.32-03	5.25-03	3.51-03	2.46-03	1.78-03	1.32-03	9.99-04	7.57-04	5.50-04	
14	2.56-01	7.84-02	3.36-02	1.73-02	1.01-02	6.34-03	4.24-03	2.96-03	2.13-03	1.57-03	1.17-03	8.34-04		
13	3.10-01	9.47-02	4.06-02	2.09-02	1.21-02	7.64-03	5.09-03	3.54-03	2.53-03	1.84-03	1.28-03			
12	3.70-01	1.13-01	4.84-02	2.50-02	1.45-02	9.07-03	6.02-03	4.16-03	2.93-03	2.00-03				
11	4.32-01	1.32-01	5.65-02	2.90-02	1.68-02	1.05-02	6.92-03	4.70-03	3.11-03					
10	4.90-01	1.50-01	6.39-02	3.28-02	1.89-02	1.17-02	7.62-03	4.87-03						
9	5.53-01	1.69-01	7.20-02	3.69-02	2.11-02	1.29-02	7.89-03							
8	6.54-01	2.00-01	8.50-02	4.33-02	2.44-02	1.41-02								
7	8.38-01	2.56-01	1.09-01	5.46-02	2.91-02									
6	1.17+00	3.58-01	1.51-01	7.24-02										
5	1.83+00	5.59-01	2.27-01											
4	3.46+00	1.00+00												
3	8.98+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.11-05	9.27-06	7.82-06	6.65-06	5.70-06	4.93-06	4.29-06	3.75-06	3.30-06	2.92-06	2.60-06	2.32-06	2.08-06	1.87-06
45	1.53-05	1.28-05	1.08-05	9.15-06	7.84-06	6.77-06	5.89-06	5.15-06	4.54-06	4.01-06	3.56-06	3.18-06	2.85-06	2.56-06
40	2.19-05	1.82-05	1.54-05	1.31-05	1.12-05	9.67-06	8.41-06	7.35-06	6.47-06	5.72-06	5.07-06	4.52-06	4.05-06	3.64-06
35	3.29-05	2.74-05	2.31-05	1.96-05	1.68-05	1.45-05	1.26-05	1.10-05	9.66-06	8.52-06	7.55-06	6.71-06	5.99-06	5.35-06
30	5.26-05	4.38-05	3.69-05	3.13-05	2.68-05	2.30-05	2.00-05	1.74-05	1.52-05	1.33-05	1.17-05	1.02-05	8.83-06	7.20-06
29	5.84-05	4.86-05	4.09-05	3.47-05	2.96-05	2.55-05	2.21-05	1.92-05	1.67-05	1.46-05	1.27-05	1.09-05	8.89-06	
28	6.50-05	5.41-05	4.55-05	3.85-05	3.29-05	2.83-05	2.45-05	2.12-05	1.84-05	1.60-05	1.37-05	1.11-05		
27	7.26-05	6.04-05	5.07-05	4.30-05	3.67-05	3.15-05	2.71-05	2.34-05	2.02-05	1.72-05	1.39-05			
26	8.15-05	6.77-05	5.69-05	4.81-05	4.10-05	3.51-05	3.01-05	2.58-05	2.19-05	1.76-05				
25	9.18-05	7.63-05	6.40-05	5.40-05	4.59-05	3.92-05	3.34-05	2.81-05	2.24-05					
24	1.04-04	8.63-05	7.22-05	6.09-05	5.15-05	4.36-05	3.65-05	2.90-05						
23	1.18-04	9.80-05	8.18-05	6.87-05	5.77-05	4.80-05	3.78-05							
22	1.35-04	1.12-04	9.29-05	7.74-05	6.39-05	5.00-05								
21	1.55-04	1.28-04	1.05-04	8.63-05	6.70-05									
20	1.78-04	1.46-04	1.18-04	9.11-05										
19	2.05-04	1.65-04	1.26-04											
18	2.34-04	1.77-04												
17	2.53-04													

HE + TE = 1.25+04 NE = 1.00+11 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	7.38-32	-1.55-38	-1.31-37	-4.19-37	-1.02-36	-2.07-36	-3.61-36	-5.22-36	-5.78-36	-4.14-36	6.43-38	6.68-36	1.55-35	2.66-35
45	1.01-31	-2.16-38	-1.82-37	-5.84-37	-1.42-36	-2.92-36	-5.13-36	-7.48-36	-8.40-36	-6.23-36	-3.68-37	9.08-36	2.20-35	3.84-35
40	1.45-31	-3.16-38	-2.64-37	-8.51-37	-2.09-36	-4.32-36	-7.66-36	-1.13-35	-1.30-35	-1.01-35	-1.56-36	1.26-35	3.25-35	5.86-35
35	2.17-31	-4.89-38	-4.06-37	-1.31-36	-3.26-36	-6.81-36	-1.23-35	-1.85-35	-2.19-35	-1.81-35	-5.04-36	1.79-35	5.13-35	9.71-35
30	3.45-31	-8.20-38	-6.71-37	-2.20-36	-5.53-36	-1.18-35	-2.17-35	-3.37-35	-4.17-35	-3.77-35	-1.68-35	2.38-35	8.77-35	1.82-34
29	3.83-31	-9.21-38	-7.51-37	-2.47-36	-6.23-36	-1.33-35	-2.47-35	-3.87-35	-4.85-35	-4.48-35	-2.17-35	2.45-35	9.87-35	2.10-34
28	4.26-31	-1.04-37	-8.44-37	-2.78-36	-7.05-36	-1.52-35	-2.83-35	-4.48-35	-5.68-35	-5.38-35	-2.83-35	2.44-35	1.11-34	2.45-34
27	4.76-31	-1.18-37	-9.54-37	-3.15-36	-8.03-36	-1.74-35	-3.27-35	-5.22-35	-6.72-35	-6.53-35	-3.74-35	2.32-35	1.26-34	2.89-34
26	5.34-31	-1.34-37	-1.08-36	-3.60-36	-9.21-36	-2.01-35	-3.81-35	-6.15-35	-8.05-35	-8.04-35	-5.00-35	1.99-35	1.43-34	3.44-34
25	6.01-31	-1.54-37	-1.24-36	-4.13-36	-1.06-35	-2.34-35	-4.48-35	-7.32-35	-9.76-35	-1.00-34	-6.78-35	1.31-35	1.62-34	4.14-34
24	6.81-31	-1.78-37	-1.42-36	-4.77-36	-1.24-35	-2.74-35	-5.32-35	-8.82-35	-1.20-34	-1.28-34	-9.36-35	1.02-37	1.82-34	5.07-34
23	7.76-31	-2.07-37	-1.65-36	-5.56-36	-1.45-35	-3.25-35	-6.39-35	-1.08-34	-1.50-34	-1.66-34	-1.32-34	-2.36-35	2.02-34	6.30-34
22	8.89-31	-2.42-37	-1.93-36	-6.53-36	-1.72-35	-3.90-35	-7.77-35	-1.34-34	-1.91-34	-2.20-34	-1.91-34	-6.73-35	2.15-34	7.96-34
21	1.03-30	-2.86-37	-2.27-36	-7.75-36	-2.07-35	-4.74-35	-9.60-35	-1.69-34	-2.49-34	-3.00-34	-2.84-34	-1.49-34	2.06-34	1.02-33
20	1.19-30	-3.40-37	-2.70-36	-9.28-36	-2.51-35	-5.84-35	-1.21-34	-2.18-34	-3.32-34	-4.22-34	-4.37-34	-3.03-34	1.43-34	1.35-33
19	1.39-30	-4.09-37	-3.23-36	-1.13-35	-3.08-35	-7.32-35	-1.55-34	-2.88-34	-4.58-34	-6.19-34	-7.07-34	-6.24-34	-9.99-35	1.75-33
18	1.65-30	-4.95-37	-3.92-36	-1.38-35	-3.85-35	-9.34-35	-2.03-34	-3.92-34	-6.56-34	-9.51-34	-1.22-33	-1.34-33	-9.04-34	1.95-33
17	1.97-30	-6.05-37	-4.81-36	-1.72-35	-4.89-35	-1.22-34	-2.74-34	-5.54-34	-9.85-34	-1.56-33	-2.27-33	-3.13-33	-3.86-33	-9.08-34
16	2.38-30	-7.43-37	-5.96-36	-2.17-35	-6.32-35	-1.63-34	-3.82-34	-8.17-34	-1.57-33	-2.77-33	-4.75-33	-8.63-33	-1.85-32	-6.13-32
15	2.91-30	-9.13-37	-7.46-36	-2.78-35	-8.34-35	-2.23-34	-5.54-34	-1.27-33	-2.70-33	-5.52-33	-1.19-32	-3.26-32	-1.79-31	
14	3.61-30	-1.11-36	-9.39-36	-3.60-35	-1.12-34	-3.16-34	-8.40-34	-2.13-33	-5.20-33	-1.31-32	-4.15-32	-2.66-31		
13	4.57-30	-1.32-36	-1.18-35	-4.69-35	-1.53-34	-4.62-34	-1.35-33	-3.92-33	-1.18-32	-4.31-32	-3.15-31			
12	5.91-30	-1.46-36	-1.46-35	-6.08-35	-2.12-34	-7.01-34	-2.34-33	-8.36-33	-3.62-32	-3.04-31				
11	7.63-30	-1.39-36	-1.74-35	-7.74-35	-2.94-34	-1.11-33	-4.53-33	-2.33-32	-2.33-31					
10	1.07-29	-8.30-37	-1.94-35	-9.51-35	-4.09-34	-1.87-33	-1.10-32	-1.30-31						
9	1.52-29	4.81-37	-2.03-35	-1.16-34	-5.98-34	-3.85-33	-5.12-32							
8	2.29-29	2.91-36	-2.12-35	-1.53-34	-1.10-33	-1.57-32								
7	3.69-29	7.73-36	-2.30-35	-2.59-34	-4.10-33									
6	6.64-29	1.99-35	-2.21-35	-7.87-34										
5	1.42-28	6.26-35	5.01-35											
4	4.25-28	3.50-34												
3	3.08-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.01-35	5.64-35	7.59-35	9.93-35	1.27-34	1.62-34	2.02-34	2.52-34	3.11-34	3.84-34	4.73-34	5.83-34	7.18-34	8.86-34
45	5.88-35	8.39-35	1.15-34	1.52-34	1.99-34	2.57-34	3.28-34	4.16-34	5.28-34	6.68-34	8.47-34	1.08-33	1.37-33	1.76-33
40	9.19-35	1.34-34	1.87-34	2.55-34	3.42-34	4.54-34	5.99-34	7.88-34	1.04-33	1.37-33	1.83-33	2.46-33	3.35-33	4.63-33
35	1.58-34	2.39-34	3.47-34	4.92-34	6.89-34	9.62-34	1.34-33	1.88-33	2.67-33	3.86-33	5.71-33	8.70-33	1.38-32	2.32-32
30	3.17-34	5.11-34	7.96-34	1.22-33	1.87-33	2.90-33	4.58-33	7.51-33	1.29-32	2.40-32	4.99-32	1.24-31	4.30-31	3.31-30
29	3.74-34	6.16-34	9.79-34	1.54-33	2.42-33	3.90-33	6.46-33	1.12-32	2.10-32	4.39-32	1.10-31	3.82-31	2.95-30	
28	4.47-34	7.54-34	1.23-33	1.99-33	3.25-33	5.49-33	9.65-33	1.82-32	3.83-32	9.64-32	3.37-31	2.62-30		
27	5.42-34	9.40-34	1.58-33	2.66-33	4.55-33	8.15-33	1.56-32	3.30-32	8.37-32	2.94-31	2.30-30			
26	6.68-34	1.20-33	2.10-33	3.70-33	6.73-33	1.31-32	2.81-32	7.19-32	2.55-31	2.00-30				
25	8.41-34	1.58-33	2.90-33	5.43-33	1.07-32	2.35-32	6.09-32	2.18-31	1.72-30					
24	1.08-33	2.15-33	4.21-33	8.59-33	1.91-32	5.05-32	1.83-31	1.46-30						
23	1.45-33	3.07-33	6.57-33	1.51-32	4.07-32	1.50-31	1.22-30							
22	2.01-33	4.69-33	1.14-32	3.18-32	1.20-31	9.88-31								
21	2.94-33	7.92-33	2.34-32	9.21-32	7.84-31									
20	4.72-33	1.58-32	6.63-32	5.87-31										
19	8.53-33	4.19-32	4.03-31											
18	1.94-32	2.33-31												
17	7.76-32													

HE + TE = 1.25+04 NE = 1.00+12 CASE B NC = 20

TOTAL RC = 2.446-12 4-3 RC = 3.512-13 4-3 EM = 1.489-24 2S RC = 5.996-13 2P RC = 1.846-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.91-03	1.20-03	5.15-04	2.67-04	1.56-04	9.86-05	6.63-05	4.68-05	3.42-05	2.57-05	1.99-05	1.56-05	1.25-05	1.02-05
45	5.38-03	1.65-03	7.10-04	3.68-04	2.14-04	1.36-04	9.14-05	6.44-05	4.71-05	3.55-05	2.74-05	2.15-05	1.73-05	1.41-05
40	7.72-03	2.37-03	1.02-03	5.27-04	3.07-04	1.95-04	1.31-04	9.22-05	6.74-05	5.08-05	3.92-05	3.08-05	2.47-05	2.01-05
35	1.16-02	3.57-03	1.53-03	7.94-04	4.63-04	2.93-04	1.97-04	1.39-04	1.01-04	7.64-05	5.89-05	4.64-05	3.72-05	3.02-05
30	1.87-02	5.74-03	2.47-03	1.28-03	7.45-04	4.72-04	3.17-04	2.23-04	1.63-04	1.23-04	9.46-05	7.45-05	5.96-05	4.85-05
29	2.08-02	6.38-03	2.74-03	1.42-03	8.28-04	5.24-04	3.52-04	2.48-04	1.81-04	1.36-04	1.05-04	8.27-05	6.62-05	5.38-05
28	2.32-02	7.12-03	3.06-03	1.58-03	9.23-04	5.84-04	3.93-04	2.77-04	2.02-04	1.52-04	1.17-04	9.21-05	7.38-05	5.99-05
27	2.60-02	7.98-03	3.43-03	1.77-03	1.03-03	6.55-04	4.40-04	3.10-04	2.26-04	1.70-04	1.31-04	1.03-04	8.25-05	6.70-05
26	2.93-02	8.98-03	3.86-03	2.00-03	1.16-03	7.37-04	4.95-04	3.49-04	2.54-04	1.91-04	1.47-04	1.16-04	9.27-05	7.53-05
25	3.31-02	1.02-02	4.36-03	2.26-03	1.32-03	8.33-04	5.60-04	3.94-04	2.88-04	2.16-04	1.67-04	1.31-04	1.05-04	8.50-05
24	3.77-02	1.16-02	4.96-03	2.57-03	1.50-03	9.47-04	6.36-04	4.48-04	3.27-04	2.46-04	1.89-04	1.49-04	1.19-04	9.64-05
23	4.32-02	1.32-02	5.68-03	2.94-03	1.71-03	1.08-03	7.28-04	5.12-04	3.74-04	2.81-04	2.16-04	1.70-04	1.36-04	1.10-04
22	4.97-02	1.52-02	6.54-03	3.39-03	1.97-03	1.25-03	8.38-04	5.89-04	4.30-04	3.23-04	2.48-04	1.95-04	1.56-04	1.26-04
21	5.77-02	1.77-02	7.59-03	3.93-03	2.29-03	1.45-03	9.71-04	6.83-04	4.98-04	3.74-04	2.88-04	2.25-04	1.80-04	1.45-04
20	6.75-02	2.07-02	8.88-03	4.59-03	2.67-03	1.69-03	1.13-03	7.98-04	5.81-04	4.36-04	3.35-04	2.63-04	2.09-04	1.69-04
19	7.97-02	2.44-02	1.05-02	5.42-03	3.15-03	1.99-03	1.34-03	9.40-04	6.85-04	5.13-04	3.94-04	3.08-04	2.45-04	1.97-04
18	9.50-02	2.91-02	1.25-02	6.46-03	3.76-03	2.37-03	1.59-03	1.12-03	8.14-04	6.09-04	4.67-04	3.64-04	2.88-04	2.30-04
17	1.15-01	3.51-02	1.51-02	7.78-03	4.53-03	2.86-03	1.92-03	1.34-03	9.77-04	7.31-04	5.58-04	4.34-04	3.41-04	2.67-04
16	1.40-01	4.28-02	1.84-02	9.49-03	5.52-03	3.48-03	2.33-03	1.63-03	1.19-03	8.85-04	6.74-04	5.20-04	4.01-04	2.96-04
15	1.73-01	5.30-02	2.27-02	1.17-02	6.82-03	4.30-03	2.88-03	2.01-03	1.46-03	1.08-03	8.18-04	6.20-04	4.50-04	
14	2.18-01	6.66-02	2.85-02	1.47-02	8.55-03	5.39-03	3.60-03	2.51-03	1.81-03	1.34-03	9.92-04	7.08-04		
13	2.78-01	8.51-02	3.64-02	1.88-02	1.09-02	6.85-03	4.57-03	3.17-03	2.27-03	1.65-03	1.15-03			
12	3.61-01	1.10-01	4.73-02	2.43-02	1.41-02	8.84-03	5.87-03	4.05-03	2.85-03	1.94-03				
11	4.75-01	1.45-01	6.20-02	3.19-02	1.84-02	1.15-02	7.58-03	5.14-03	3.40-03					
10	6.27-01	1.91-01	8.16-02	4.19-02	2.41-02	1.49-02	9.67-03	6.17-03						
9	8.11-01	2.47-01	1.05-01	5.37-02	3.07-02	1.87-02	1.14-02							
8	9.91-01	3.01-01	1.28-01	6.48-02	3.64-02	2.09-02								
7	1.15+00	3.48-01	1.46-01	7.31-02	3.87-02									
6	1.40+00	4.22-01	1.75-01	8.25-02										
5	2.01+00	5.98-01	2.35-01											
4	3.58+00	1.00+00												
3	8.96+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.42-06	7.02-06	5.92-06	5.04-06	4.32-06	3.73-06	3.25-06	2.84-06	2.50-06	2.21-06	1.97-06	1.75-06	1.57-06	1.42-06
45	1.16-05	9.67-06	8.15-06	6.93-06	5.94-06	5.13-06	4.46-06	3.91-06	3.44-06	3.04-06	2.70-06	2.41-06	2.16-06	1.94-06
40	1.66-05	1.38-05	1.16-05	9.90-06	8.49-06	7.33-06	6.37-06	5.57-06	4.90-06	4.33-06	3.85-06	3.43-06	3.07-06	2.75-06
35	2.49-05	2.08-05	1.75-05	1.49-05	1.27-05	1.10-05	9.54-06	8.33-06	7.32-06	6.46-06	5.72-06	5.09-06	4.54-06	4.06-06
30	3.99-05	3.32-05	2.80-05	2.37-05	2.03-05	1.75-05	1.51-05	1.32-05	1.15-05	1.01-05	8.87-06	7.76-06	6.70-06	5.46-06
29	4.43-05	3.69-05	3.10-05	2.63-05	2.25-05	1.94-05	1.67-05	1.46-05	1.27-05	1.11-05	9.66-06	8.30-06	6.75-06	
28	4.93-05	4.11-05	3.45-05	2.93-05	2.50-05	2.15-05	1.86-05	1.61-05	1.40-05	1.21-05	1.04-05	8.39-06		
27	5.51-05	4.59-05	3.85-05	3.26-05	2.79-05	2.39-05	2.06-05	1.78-05	1.54-05	1.31-05	1.05-05			
26	6.19-05	5.15-05	4.32-05	3.66-05	3.12-05	2.67-05	2.29-05	1.96-05	1.66-05	1.33-05				
25	6.98-05	5.80-05	4.87-05	4.11-05	3.49-05	2.98-05	2.54-05	2.14-05	1.71-05					
24	7.91-05	6.57-05	5.50-05	4.63-05	3.92-05	3.32-05	2.78-05	2.21-05						
23	9.01-05	7.47-05	6.24-05	5.24-05	4.40-05	3.66-05	2.88-05							
22	1.03-04	8.53-05	7.10-05	5.91-05	4.88-05	3.82-05								
21	1.19-04	9.78-05	8.07-05	6.61-05	5.13-05									
20	1.37-04	1.12-04	9.10-05	7.01-05										
19	1.59-04	1.27-04	9.73-05											
18	1.82-04	1.38-04												
17	1.99-04													

HE + TE = 1.25+04 NE = 1.00+12 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.54-32	-1.55-38	-1.07-37	-3.14-37	-6.26-37	-6.80-37	4.40-37	3.25-36	7.50-36	1.29-35	1.95-35	2.75-35	3.70-35	4.84-35
45	1.31-31	-2.17-38	-1.49-37	-4.39-37	-8.82-37	-9.76-37	5.67-37	4.51-36	1.05-35	1.83-35	2.79-35	3.96-35	5.38-35	7.11-35
40	1.87-31	-3.17-38	-2.17-37	-6.42-37	-1.30-36	-1.48-36	7.29-37	6.50-36	1.55-35	2.73-35	4.21-35	6.04-35	8.33-35	1.12-34
35	2.80-31	-4.91-38	-3.35-37	-9.97-37	-2.05-36	-2.41-36	8.98-37	9.89-36	2.42-35	4.35-35	6.84-35	1.00-34	1.41-34	1.94-34
30	4.46-31	-8.24-38	-5.58-37	-1.68-36	-3.54-36	-4.38-36	8.89-37	1.61-35	4.13-35	7.67-35	1.24-34	1.88-34	2.75-34	3.94-34
29	4.95-31	-9.26-38	-6.25-37	-1.89-36	-4.00-36	-5.01-36	8.09-37	1.79-35	4.66-35	8.73-35	1.43-34	2.18-34	3.22-34	4.67-34
28	5.51-31	-1.05-37	-7.04-37	-2.14-36	-4.55-36	-5.79-36	6.72-37	2.00-35	5.29-35	1.00-34	1.65-34	2.56-34	3.82-34	5.61-34
27	6.15-31	-1.19-37	-7.97-37	-2.43-36	-5.21-36	-6.73-36	4.54-37	2.25-35	6.04-35	1.16-34	1.93-34	3.02-34	4.58-34	6.85-34
26	6.90-31	-1.35-37	-9.08-37	-2.78-36	-6.01-36	-7.90-36	1.14-37	2.54-35	6.94-35	1.35-34	2.28-34	3.62-34	5.58-34	8.50-34
25	7.77-31	-1.56-37	-1.04-36	-3.21-36	-6.99-36	-9.35-36	-4.01-37	2.87-35	8.05-35	1.59-34	2.73-34	4.40-34	6.92-34	1.08-33
24	8.80-31	-1.80-37	-1.20-36	-3.73-36	-8.19-36	-1.12-35	-1.18-36	3.27-35	9.41-35	1.89-34	3.31-34	5.44-34	8.75-34	1.40-33
23	1.00-30	-2.10-37	-1.40-36	-4.36-36	-9.71-36	-1.36-35	-2.35-36	3.73-35	1.11-34	2.28-34	4.07-34	6.87-34	1.14-33	1.89-33
22	1.15-30	-2.48-37	-1.64-36	-5.16-36	-1.16-35	-1.67-35	-4.13-36	4.28-35	1.33-34	2.79-34	5.12-34	8.89-34	1.52-33	2.65-33
21	1.32-30	-2.94-37	-1.95-36	-6.18-36	-1.41-35	-2.08-35	-6.84-36	4.92-35	1.60-34	3.48-34	6.59-34	1.19-33	2.13-33	3.93-33
20	1.54-30	-3.53-37	-2.33-36	-7.48-36	-1.74-35	-2.64-35	-1.10-35	5.68-35	1.97-34	4.44-34	8.74-34	1.65-33	3.14-33	6.29-33
19	1.80-30	-4.30-37	-2.83-36	-9.19-36	-2.17-35	-3.43-35	-1.77-35	6.53-35	2.46-34	5.82-34	1.20-33	2.42-33	5.00-33	1.12-32
18	2.13-30	-5.31-37	-3.49-36	-1.15-35	-2.77-35	-4.56-35	-2.86-35	7.43-35	3.14-34	7.90-34	1.74-33	3.81-33	8.86-33	2.40-32
17	2.54-30	-6.65-37	-4.37-36	-1.46-35	-3.62-35	-6.24-35	-4.69-35	8.21-35	4.10-34	1.12-33	2.71-33	6.67-33	1.87-32	7.10-32
16	3.07-30	-8.48-37	-5.58-36	-1.90-35	-4.87-35	-8.84-35	-7.92-35	8.40-35	5.51-34	1.69-33	4.65-33	1.39-32	5.46-32	4.62-31
15	3.76-30	-1.10-36	-7.27-36	-2.54-35	-6.75-35	-1.31-34	-1.39-34	6.61-35	7.64-34	2.78-33	9.39-33	3.95-32	3.48-31	
14	4.67-30	-1.46-36	-9.71-36	-3.50-35	-9.73-35	-2.03-34	-2.58-34	-1.37-35	1.10-33	5.26-33	2.56-32	2.44-31		
13	5.91-30	-1.99-36	-1.33-35	-4.99-35	-1.47-34	-3.37-34	-5.16-34	-3.00-34	1.58-33	1.29-32	1.47-31			
12	7.63-30	-2.76-36	-1.89-35	-7.43-35	-2.36-34	-6.07-34	-1.16-33	-1.40-33	1.65-33	6.00-32				
11	1.01-29	-3.88-36	-2.76-35	-1.16-34	-4.06-34	-1.22-33	-3.08-33	-7.06-33	-1.53-32					
10	1.38-29	-5.44-36	-4.11-35	-1.89-34	-7.65-34	-2.90-33	-1.11-32	-6.92-32						
9	1.97-29	-7.24-36	-6.11-35	-3.22-34	-1.62-33	-9.05-33	-8.44-32							
8	2.96-29	-8.14-36	-8.63-35	-5.61-34	-4.10-33	-5.46-32								
7	4.77-29	-5.81-36	-1.12-34	-1.06-33	-1.80-32									
6	8.58-29	2.45-36	-1.56-34	-3.51-33										
5	1.83-28	3.13-35	-3.55-34											
4	5.49-28	2.61-34												
3	3.98-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.21-35	7.85-35	9.83-35	1.22-34	1.51-34	1.85-34	2.27-34	2.77-34	3.38-34	4.13-34	5.04-34	6.15-34	7.53-34	9.25-34
45	9.23-35	1.18-34	1.50-34	1.89-34	2.37-34	2.96-34	3.70-34	4.62-34	5.76-34	7.21-34	9.06-34	1.14-33	1.45-33	1.85-33
40	1.47-34	1.92-34	2.49-34	3.20-34	4.12-34	5.30-34	6.82-34	8.81-34	1.14-33	1.49-33	1.97-33	2.63-33	3.55-33	4.89-33
35	2.63-34	3.53-34	4.72-34	6.31-34	8.46-34	1.14-33	1.55-33	2.14-33	2.99-33	4.26-33	6.23-33	9.41-33	1.48-32	2.48-32
30	5.59-34	7.93-34	1.13-33	1.62-33	2.37-33	3.54-33	5.46-33	8.74-33	1.48-32	2.71-32	5.57-32	1.37-31	4.72-31	3.61-30
29	6.73-34	9.69-34	1.41-33	2.07-33	3.11-33	4.82-33	7.76-33	1.32-32	2.42-32	4.99-32	1.23-31	4.25-31	3.26-30	
28	8.21-34	1.21-33	1.79-33	2.71-33	4.22-33	6.84-33	1.17-32	2.16-32	4.46-32	1.10-31	3.82-31	2.93-30		
27	1.02-33	1.53-33	2.35-33	3.68-33	5.99-33	1.03-32	1.91-32	3.96-32	9.84-32	3.41-31	2.63-30			
26	1.30-33	2.01-33	3.17-33	5.21-33	9.00-33	1.68-32	3.49-32	8.71-32	3.03-31	2.34-30				
25	1.69-33	2.71-33	4.49-33	7.81-33	1.46-32	3.07-32	7.68-32	2.68-31	2.08-30					
24	2.28-33	3.82-33	6.71-33	1.27-32	2.67-32	6.72-32	2.36-31	1.83-30						
23	3.21-33	5.71-33	1.09-32	2.30-32	5.84-32	2.06-31	1.61-30							
22	4.78-33	9.20-33	1.97-32	5.02-32	1.78-31	1.40-30								
21	7.68-33	1.66-32	4.28-32	1.53-31	1.21-30									
20	1.38-32	3.60-32	1.30-31	1.03-30										
19	2.98-32	1.08-31	8.69-31											
18	8.89-32	7.21-31												
17	5.86-31													

HE + TE = 1.25+04 NE = 1.00+13 CASE B NC = 20

TOTAL RC = 3.847-12 4-3 RC = 5.998-13 4-3 EM = 2.542-24 2S RC = 8.298-13 2P RC = 3.017-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.29-03	7.02-04	3.02-04	1.56-04	9.12-05	5.77-05	3.89-05	2.74-05	2.00-05	1.51-05	1.16-05	9.16-06	7.35-06	5.98-06
45	3.15-03	9.67-04	4.16-04	2.15-04	1.26-04	7.95-05	5.35-05	3.77-05	2.76-05	2.08-05	1.60-05	1.26-05	1.01-05	8.23-06
40	4.52-03	1.39-03	5.96-04	3.08-04	1.80-04	1.14-04	7.67-05	5.40-05	3.95-05	2.97-05	2.29-05	1.81-05	1.45-05	1.18-05
35	6.81-03	2.09-03	8.97-04	4.65-04	2.71-04	1.72-04	1.15-04	8.13-05	5.94-05	4.47-05	3.45-05	2.72-05	2.18-05	1.77-05
30	1.10-02	3.36-03	1.45-03	7.48-04	4.36-04	2.76-04	1.86-04	1.31-04	9.56-05	7.19-05	5.54-05	4.36-05	3.49-05	2.84-05
29	1.22-02	3.74-03	1.61-03	8.32-04	4.85-04	3.07-04	2.06-04	1.45-04	1.06-04	7.99-05	6.16-05	4.84-05	3.88-05	3.15-05
28	1.36-02	4.17-03	1.79-03	9.28-04	5.41-04	3.42-04	2.30-04	1.62-04	1.18-04	8.90-05	6.86-05	5.40-05	4.32-05	3.51-05
27	1.52-02	4.67-03	2.01-03	1.04-03	6.06-04	3.83-04	2.58-04	1.82-04	1.33-04	9.97-05	7.68-05	6.04-05	4.83-05	3.93-05
26	1.72-02	[illegible]	2.26-03	1.17-03	6.82-04	4.32-04	2.90-04	2.04-04	1.49-04	1.12-04	8.64-05	6.79-05	5.43-05	4.41-05
25	1.94-02	[illegible]	2.56-03	1.32-03	7.71-04	4.88-04	3.28-04	2.31-04	1.69-04	1.27-04	9.76-05	7.67-05	6.14-05	4.98-05
24	2.21-02	6.78-03	2.91-03	1.51-03	8.77-04	5.55-04	3.73-04	2.63-04	1.92-04	1.44-04	1.11-04	8.71-05	6.97-05	5.65-05
23	2.53-02	7.76-03	3.33-03	1.72-03	1.00-03	6.35-04	4.27-04	3.00-04	2.19-04	1.65-04	1.27-04	9.95-05	7.95-05	6.44-05
22	2.92-02	8.94-03	3.84-03	1.99-03	1.16-03	7.32-04	4.91-04	3.46-04	2.52-04	1.89-04	1.46-04	1.14-04	9.13-05	7.39-05
21	3.39-02	1.04-02	4.46-03	2.30-03	1.34-03	8.49-04	5.70-04	4.01-04	2.92-04	2.19-04	1.69-04	1.32-04	1.06-04	8.53-05
20	3.96-02	1.21-02	5.21-03	2.70-03	1.57-03	9.93-04	6.67-04	4.69-04	3.41-04	2.56-04	1.97-04	1.54-04	1.23-04	9.90-05
19	4.68-02	1.44-02	6.16-03	3.19-03	1.85-03	1.17-03	7.86-04	5.53-04	4.02-04	3.02-04	2.32-04	1.81-04	1.44-04	1.16-04
18	5.59-02	1.71-02	7.35-03	3.80-03	2.21-03	1.40-03	9.37-04	6.58-04	4.79-04	3.59-04	2.75-04	2.15-04	1.70-04	1.35-04
17	6.76-02	2.07-02	8.88-03	4.59-03	2.67-03	1.69-03	1.13-03	7.93-04	5.77-04	4.31-04	3.29-04	2.56-04	2.01-04	1.58-04
16	8.28-02	2.54-02	1.09-02	5.62-03	3.27-03	2.06-03	1.38-03	9.68-04	7.02-04	5.24-04	3.99-04	3.08-04	2.37-04	1.75-04
15	1.03-01	3.16-02	1.35-02	6.98-03	4.06-03	2.56-03	1.71-03	1.20-03	8.67-04	6.44-04	4.87-04	3.69-04	2.68-04	
14	1.31-01	4.00-02	1.71-02	8.84-03	5.13-03	3.23-03	2.16-03	1.51-03	1.09-03	8.02-04	5.95-04	4.25-04		
13	1.69-01	5.18-02	2.22-02	1.14-02	6.63-03	4.17-03	2.78-03	1.93-03	1.38-03	1.00-03	7.00-04			
12	2.25-01	6.88-02	2.94-02	1.52-02	8.78-03	5.50-03	3.65-03	2.52-03	1.77-03	1.21-03				
11	3.08-01	9.41-02	4.02-02	2.07-02	1.19-02	7.46-03	4.91-03	3.33-03	2.20-03					
10	4.37-01	1.33-01	5.68-02	2.91-02	1.68-02	1.04-02	6.73-03	4.29-03						
9	6.42-01	1.95-01	8.32-02	4.25-02	2.42-02	1.48-02	8.99-03							
8	9.70-01	2.95-01	1.25-01	6.33-02	3.55-02	2.03-02								
7	1.45+00	4.39-01	1.85-01	9.19-02	4.85-02									
6	1.96+00	5.87-01	2.43-01	1.14-01										
5	2.39+00	7.06-01	2.75-01											
4	3.60+00	1.00+00												
3	8.41+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.93-06	4.11-06	3.47-06	2.95-06	2.53-06	2.19-06	1.90-06	1.66-06	1.46-06	1.30-06	1.15-06	1.03-06	9.21-07	8.29-07
45	6.79-06	5.66-06	4.77-06	4.06-06	3.48-06	3.01-06	2.61-06	2.29-06	2.01-06	1.78-06	1.58-06	1.41-06	1.26-06	1.14-06
40	9.71-06	8.10-06	6.82-06	5.80-06	4.97-06	4.29-06	3.73-06	3.26-06	2.87-06	2.54-06	2.25-06	2.01-06	1.80-06	1.61-06
35	1.46-05	1.22-05	1.02-05	8.70-06	7.45-06	6.43-06	5.59-06	4.88-06	4.29-06	3.78-06	3.35-06	2.98-06	2.66-06	2.38-06
30	2.34-05	1.95-05	1.64-05	1.39-05	1.19-05	1.02-05	8.87-06	7.73-06	6.75-06	5.92-06	5.20-06	4.55-06	3.92-06	3.20-06
29	2.59-05	2.16-05	1.82-05	1.54-05	1.32-05	1.13-05	9.81-06	8.53-06	7.44-06	6.50-06	5.66-06	4.86-06	3.95-06	
28	2.89-05	2.40-05	2.02-05	1.71-05	1.46-05	1.26-05	1.09-05	9.43-06	8.19-06	7.10-06	6.08-06	4.92-06		
27	3.23-05	2.69-05	2.26-05	1.91-05	1.63-05	1.40-05	1.21-05	1.04-05	8.99-06	7.66-06	6.17-06			
26	3.63-05	3.02-05	2.53-05	2.14-05	1.83-05	1.56-05	1.34-05	1.15-05	9.75-06	7.82-06				
25	4.09-05	3.40-05	2.85-05	2.41-05	2.05-05	1.75-05	1.49-05	1.25-05	1.00-05					
24	4.64-05	3.85-05	3.22-05	2.72-05	2.30-05	1.95-05	1.63-05	1.29-05						
23	5.29-05	4.38-05	3.66-05	3.07-05	2.58-05	2.15-05	1.69-05							
22	6.05-05	5.00-05	4.16-05	3.47-05	2.86-05	2.24-05								
21	6.97-05	5.74-05	4.74-05	3.88-05	3.01-05									
20	8.06-05	6.58-05	5.34-05	4.12-05										
19	9.33-05	7.49-05	5.72-05											
18	1.07-04	8.11-05												
17	1.18-04													

HE + TE = 1.25+04 NE = 1.00+13 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.28-31	-2.38-39	-3.02-38	6.01-38	9.01-37	2.99-36	5.91-36	9.45-36	1.37-35	1.88-35	2.51-35	3.27-35	4.19-35	5.31-35
45	1.76-31	-3.60-39	-4.31-38	7.87-38	1.24-36	4.16-36	8.26-36	1.33-35	1.94-35	2.68-35	3.60-35	4.72-35	6.11-35	7.82-35
40	2.51-31	-5.81-39	-6.47-38	1.04-37	1.78-36	6.02-36	1.21-35	1.95-35	2.87-35	4.02-35	5.45-35	7.24-35	9.50-35	1.23-34
35	3.75-31	-1.02-38	-1.04-37	1.38-37	2.67-36	9.22-36	1.87-35	3.06-35	4.57-35	6.48-35	8.93-35	1.21-34	1.62-34	2.15-34
30	5.99-31	-2.00-38	-1.85-37	1.75-37	4.30-36	1.52-35	3.14-35	5.26-35	8.00-35	1.16-34	1.65-34	2.30-34	3.18-34	4.40-34
29	6.64-31	-2.33-38	-2.10-37	1.80-37	4.77-36	1.70-35	3.54-35	5.94-35	9.10-35	1.33-34	1.90-34	2.67-34	3.74-34	5.23-34
28	7.39-31	-2.73-38	-2.41-37	1.82-37	5.32-36	1.91-35	4.00-35	6.76-35	1.04-34	1.53-34	2.21-34	3.14-34	4.44-34	6.30-34
27	8.25-31	-3.22-38	-2.78-37	1.81-37	5.95-36	2.16-35	4.54-35	7.73-35	1.20-34	1.78-34	2.59-34	3.73-34	5.35-34	7.71-34
26	9.25-31	-3.84-38	-3.22-37	1.74-37	6.69-36	2.45-35	5.20-35	8.92-35	1.40-34	2.09-34	3.08-34	4.49-34	6.54-34	9.60-34
25	1.04-30	-4.60-38	-3.77-37	1.59-37	7.55-36	2.81-35	5.99-35	1.04-34	1.64-34	2.49-34	3.70-34	5.48-34	8.14-34	1.22-33
24	1.18-30	-5.58-38	-4.46-37	1.30-37	8.57-36	3.23-35	6.97-35	1.22-34	1.94-34	2.99-34	4.52-34	6.82-34	1.04-33	1.60-33
23	1.35-30	-6.82-38	-5.32-37	8.31-38	9.79-36	3.75-35	8.17-35	1.44-34	2.34-34	3.65-34	5.62-34	8.67-34	1.35-33	2.16-33
22	1.54-30	-8.44-38	-6.42-37	6.61-39	1.12-35	4.38-35	9.68-35	1.73-34	2.85-34	4.53-34	7.14-34	1.13-33	1.83-33	3.06-33
21	1.78-30	-1.06-37	-7.84-37	-1.14-37	1.30-35	5.18-35	1.16-34	2.11-34	3.54-34	5.75-34	9.31-34	1.53-33	2.58-33	4.57-33
20	2.06-30	-1.34-37	-9.70-37	-3.02-37	1.51-35	6.18-35	1.41-34	2.62-34	4.49-34	7.49-34	1.25-33	2.15-33	3.85-33	7.39-33
19	2.42-30	-1.73-37	-1.22-36	-5.97-37	1.77-35	7.48-35	1.75-34	3.31-34	5.83-34	1.01-33	1.76-33	3.20-33	6.21-33	1.34-32
18	2.86-30	-2.26-37	-1.56-36	-1.06-36	2.09-35	9.19-35	2.20-34	4.30-34	7.83-34	1.41-33	2.62-33	5.15-33	1.12-32	2.90-32
17	3.41-30	-3.02-37	-2.04-36	-1.81-36	2.48-35	1.15-34	2.84-34	5.75-34	1.09-33	2.09-33	4.20-33	9.28-33	2.43-32	8.77-32
16	4.12-30	-4.13-37	-2.73-36	-3.04-36	2.97-35	1.46-34	3.78-34	8.00-34	1.61-33	3.34-33	7.53-33	2.00-32	7.30-32	5.86-31
15	5.04-30	-5.77-37	-3.76-36	-5.10-36	3.57-35	1.92-34	5.21-34	1.17-33	2.56-33	5.96-33	1.61-32	5.97-32	4.85-31	
14	6.27-30	-8.31-37	-5.36-36	-8.70-36	4.27-35	2.58-34	7.54-34	1.84-33	4.53-33	1.27-32	4.79-32	3.94-31		
13	7.93-30	-1.24-36	-7.92-36	-1.53-35	5.01-35	3.62-34	1.17-33	3.22-33	9.54-33	3.72-32	3.13-31			
12	1.02-29	-1.91-36	-1.23-35	-2.79-35	5.47-35	5.34-34	1.99-33	6.66-33	2.76-32	2.40-31				
11	1.36-29	-3.09-36	-2.02-35	-5.40-35	4.47-35	8.40-34	3.95-33	1.87-32	1.74-31					
10	1.86-29	-5.25-36	-3.54-35	-1.13-34	-2.66-35	1.44-33	1.04-32	1.12-31						
9	2.64-29	-9.39-36	-6.76-35	-2.66-34	-3.77-34	2.73-33	5.44-32							
8	3.97-29	-1.75-35	-1.42-34	-7.34-34	-2.41-33	3.14-33								
7	6.40-29	-3.24-35	-3.24-34	-2.58-33	-2.54-32									
6	1.15-28	-4.91-35	-7.73-34	-1.54-32										
5	2.46-28	-3.93-35	-2.38-33											
4	7.36-28	1.63-34												
3	5.34-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.66-35	8.30-35	1.03-34	1.26-34	1.55-34	1.90-34	2.32-34	2.82-34	3.43-34	4.18-34	5.09-34	6.21-34	7.60-34	9.32-34
45	9.92-35	1.25-34	1.57-34	1.96-34	2.44-34	3.04-34	3.78-34	4.70-34	5.85-34	7.31-34	9.16-34	1.15-33	1.46-33	1.86-33
40	1.59-34	2.04-34	2.61-34	3.33-34	4.26-34	5.44-34	6.98-34	8.98-34	1.16-33	1.52-33	2.00-33	2.66-33	3.59-33	4.94-33
35	2.84-34	3.76-34	4.96-34	6.58-34	8.76-34	1.18-33	1.59-33	2.18-33	3.05-33	4.33-33	6.32-33	9.54-33	1.50-32	2.51-32
30	6.10-34	8.50-34	1.19-33	1.70-33	2.47-33	3.67-33	5.62-33	8.98-33	1.52-32	2.77-32	5.68-32	1.40-31	4.80-31	3.65-30
29	7.35-34	1.04-33	1.49-33	2.17-33	3.24-33	4.99-33	8.01-33	1.36-32	2.49-32	5.11-32	1.26-31	4.33-31	3.31-30	
28	8.99-34	1.30-33	1.90-33	2.85-33	4.41-33	7.11-33	1.21-32	2.22-32	4.57-32	1.13-31	3.90-31	2.99-30		
27	1.12-33	1.66-33	2.50-33	3.88-33	6.27-33	1.07-32	1.98-32	4.08-32	1.01-31	3.49-31	2.68-30			
26	1.43-33	2.17-33	3.39-33	5.51-33	9.44-33	1.75-32	3.63-32	9.01-32	3.12-31	2.40-30				
25	1.87-33	2.94-33	4.81-33	8.28-33	1.54-32	3.20-32	7.99-32	2.78-31	2.14-30					
24	2.53-33	4.17-33	7.22-33	1.35-32	2.82-32	7.05-32	2.46-31	1.90-30						
23	3.58-33	6.25-33	1.17-32	2.46-32	6.18-32	2.16-31	1.68-30							
22	5.36-33	1.01-32	2.14-32	5.39-32	1.89-31	1.47-30								
21	8.69-33	1.84-32	4.68-32	1.65-31	1.29-30									
20	1.58-32	4.03-32	1.43-31	1.12-30										
19	3.44-32	1.22-31	9.66-31											
18	1.04-31	8.26-31												
17	7.00-31													

HE + TE = 1.50+04 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 1.127-12 4-3 RC = 2.331-13 4-3 EM = 9.879-25 2S RC = 3.190-13 2P RC = 8.082-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.97-04	3.74-04	1.96-04	1.19-04	7.90-05	5.52-05	4.02-05	3.02-05	2.33-05	1.83-05	1.47-05	1.20-05	9.85-06	8.21-06
45	1.34-03	5.05-04	2.67-04	1.63-04	1.08-04	7.56-05	5.52-05	4.15-05	3.20-05	2.53-05	2.03-05	1.65-05	1.36-05	1.13-05
40	1.88-03	7.11-04	3.77-04	2.31-04	1.53-04	1.08-04	7.86-05	5.92-05	4.57-05	3.61-05	2.89-05	2.36-05	1.94-05	1.62-05
35	2.77-03	1.05-03	5.59-04	3.43-04	2.28-04	1.60-04	1.17-04	8.85-05	6.85-05	5.40-05	4.34-05	3.53-05	2.92-05	2.43-05
30	4.36-03	1.66-03	8.84-04	5.43-04	3.62-04	2.55-04	1.87-04	1.41-04	1.09-04	8.63-05	6.93-05	5.65-05	4.66-05	3.89-05
29	4.82-03	1.84-03	9.78-04	6.01-04	4.01-04	2.82-04	2.07-04	1.56-04	1.21-04	9.56-05	7.69-05	6.27-05	5.17-05	4.32-05
28	5.35-03	2.04-03	1.09-03	6.67-04	4.45-04	3.14-04	2.30-04	1.74-04	1.35-04	1.06-04	8.56-05	6.98-05	5.76-05	4.81-05
27	5.95-03	2.27-03	1.21-03	7.44-04	4.97-04	3.50-04	2.57-04	1.94-04	1.50-04	1.19-04	9.56-05	7.80-05	6.44-05	5.37-05
26	6.65-03	2.53-03	1.35-03	8.33-04	5.56-04	3.92-04	2.88-04	2.18-04	1.69-04	1.33-04	1.07-04	8.76-05	7.23-05	6.03-05
25	7.47-03	2.85-03	1.52-03	9.37-04	6.26-04	4.42-04	3.24-04	2.45-04	1.90-04	1.51-04	1.21-04	9.88-05	8.16-05	6.80-05
24	8.42-03	3.21-03	1.72-03	1.06-03	7.08-04	5.00-04	3.67-04	2.78-04	2.16-04	1.71-04	1.37-04	1.12-04	9.25-05	7.71-05
23	9.55-03	3.64-03	1.95-03	1.20-03	8.05-04	5.69-04	4.18-04	3.17-04	2.46-04	1.95-04	1.57-04	1.28-04	1.05-04	8.79-05
22	1.09-02	4.16-03	2.22-03	1.37-03	9.21-04	6.51-04	4.79-04	3.63-04	2.82-04	2.23-04	1.80-04	1.47-04	1.21-04	1.01-04
21	1.25-02	4.77-03	2.56-03	1.58-03	1.06-03	7.50-04	5.52-04	4.19-04	3.25-04	2.58-04	2.07-04	1.69-04	1.40-04	1.16-04
20	1.44-02	5.51-03	2.96-03	1.83-03	1.23-03	8.71-04	6.41-04	4.87-04	3.78-04	3.00-04	2.41-04	1.97-04	1.62-04	1.34-04
19	1.68-02	6.42-03	3.45-03	2.14-03	1.44-03	1.02-03	7.51-04	5.71-04	4.44-04	3.52-04	2.83-04	2.31-04	1.90-04	1.57-04
18	1.97-02	7.53-03	4.05-03	2.52-03	1.69-03	1.20-03	8.88-04	6.75-04	5.26-04	4.17-04	3.35-04	2.73-04	2.23-04	1.82-04
17	2.33-02	8.93-03	4.81-03	2.99-03	2.02-03	1.44-03	1.06-03	8.08-04	6.29-04	4.99-04	4.01-04	3.25-04	2.64-04	2.10-04
16	2.78-02	1.07-02	5.78-03	3.60-03	2.43-03	1.73-03	1.28-03	9.78-04	7.62-04	6.04-04	4.84-04	3.89-04	3.08-04	2.25-04
15	3.37-02	1.30-02	7.02-03	4.39-03	2.97-03	2.12-03	1.57-03	1.20-03	9.35-04	7.40-04	5.89-04	4.63-04	3.37-04	
14	4.13-02	1.59-02	8.66-03	5.42-03	3.68-03	2.64-03	1.96-03	1.50-03	1.16-03	9.17-04	7.15-04	5.17-04		
13	5.14-02	1.99-02	1.08-02	6.82-03	4.65-03	3.34-03	2.48-03	1.90-03	1.47-03	1.14-03	8.19-04			
12	6.53-02	2.53-02	1.39-02	8.76-03	6.00-03	4.32-03	3.22-03	2.46-03	1.88-03	1.34-03				
11	8.46-02	3.30-02	1.82-02	1.15-02	7.93-03	5.74-03	4.28-03	3.23-03	2.30-03					
10	1.13-01	4.41-02	2.45-02	1.57-02	1.08-02	7.87-03	5.83-03	4.12-03						
9	1.55-01	6.11-02	3.42-02	2.21-02	1.54-02	1.12-02	7.84-03							
8	2.22-01	8.84-02	5.02-02	3.29-02	2.31-02	1.60-02								
7	3.36-01	1.36-01	7.87-02	5.23-02	3.57-02									
6	5.50-01	2.27-01	1.35-01	8.95-02										
5	1.01+00	4.30-01	2.63-01											
4	2.22+00	1.00+00												
3	6.98+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.91-06	5.87-06	5.03-06	4.34-06	3.76-06	3.29-06	2.88-06	2.54-06	2.25-06	2.01-06	1.79-06	1.61-06	1.44-06	1.30-06
45	9.54-06	8.11-06	6.94-06	5.99-06	5.20-06	4.54-06	3.98-06	3.51-06	3.11-06	2.76-06	2.47-06	2.21-06	1.98-06	1.79-06
40	1.37-05	1.16-05	9.93-06	8.57-06	7.43-06	6.49-06	5.69-06	5.01-06	4.43-06	3.94-06	3.51-06	3.14-06	2.81-06	2.52-06
35	2.05-05	1.74-05	1.49-05	1.28-05	1.11-05	9.71-06	8.51-06	7.48-06	6.60-06	5.85-06	5.19-06	4.61-06	4.10-06	3.65-06
30	3.28-05	2.78-05	2.38-05	2.05-05	1.77-05	1.54-05	1.34-05	1.18-05	1.03-05	8.99-06	7.83-06	6.76-06	5.69-06	4.44-06
29	3.64-05	3.09-05	2.64-05	2.27-05	1.96-05	1.70-05	1.48-05	1.29-05	1.13-05	9.78-06	8.41-06	7.06-06	5.49-06	
28	4.05-05	3.44-05	2.94-05	2.52-05	2.18-05	1.89-05	1.64-05	1.42-05	1.23-05	1.05-05	8.82-06	6.83-06		
27	4.52-05	3.84-05	3.28-05	2.81-05	2.43-05	2.10-05	1.81-05	1.56-05	1.33-05	1.11-05	8.57-06			
26	5.08-05	4.31-05	3.67-05	3.15-05	2.71-05	2.33-05	2.00-05	1.70-05	1.41-05	1.08-05				
25	5.72-05	4.85-05	4.13-05	3.53-05	3.03-05	2.59-05	2.19-05	1.81-05	1.39-05					
24	6.48-05	5.49-05	4.66-05	3.97-05	3.38-05	2.85-05	2.35-05	1.79-05						
23	7.38-05	6.23-05	5.28-05	4.47-05	3.76-05	3.08-05	2.33-05							
22	8.44-05	7.11-05	5.98-05	5.00-05	4.09-05	3.08-05								
21	9.70-05	8.12-05	6.76-05	5.50-05	4.12-05									
20	1.12-04	9.26-05	7.50-05	5.59-05										
19	1.29-04	1.04-04	7.70-05											
18	1.46-04	1.08-04												
17	1.54-04													

HE + TE = 1.50+04 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.49-38	2.18-38	4.16-38	7.84-38	1.38-37	2.28-37	3.53-37	5.22-37	7.42-37	1.02-36	1.36-36	1.77-36	2.25-36
45	0.00+00	2.04-38	3.03-38	5.89-38	1.13-37	2.00-37	3.31-37	5.13-37	7.55-37	1.06-36	1.44-36	1.89-36	2.39-36	2.94-36
40	0.00+00	2.91-38	4.38-38	8.65-38	1.68-37	3.01-37	5.02-37	7.83-37	1.16-36	1.63-36	2.21-36	2.88-36	3.62-36	4.36-36
35	0.00+00	4.38-38	6.67-38	1.34-37	2.63-37	4.80-37	8.11-37	1.28-36	1.92-36	2.74-36	3.75-36	4.92-36	6.19-36	7.40-36
30	0.00+00	7.03-38	1.09-37	2.23-37	4.48-37	8.34-37	1.44-36	2.32-36	3.55-36	5.18-36	7.24-36	9.68-36	1.23-35	1.46-35
29	0.00+00	7.81-38	1.21-37	2.50-37	5.05-37	9.43-37	1.64-36	2.66-36	4.09-36	6.00-36	8.43-36	1.13-35	1.44-35	1.71-35
28	0.00+00	8.71-38	1.36-37	2.81-37	5.71-37	1.07-36	1.87-36	3.06-36	4.74-36	7.01-36	9.90-36	1.34-35	1.71-35	2.01-35
27	0.00+00	9.75-38	1.53-37	3.18-37	6.50-37	1.23-36	2.16-36	3.55-36	5.54-36	8.25-36	1.17-35	1.59-35	2.04-35	2.38-35
26	0.00+00	1.10-37	1.73-37	3.62-37	7.44-37	1.42-36	2.50-36	4.15-36	6.53-36	9.80-36	1.41-35	1.92-35	2.46-35	2.82-35
25	0.00+00	1.24-37	1.97-37	4.14-37	8.57-37	1.64-36	2.93-36	4.90-36	7.78-36	1.18-35	1.71-35	2.35-35	3.00-35	3.36-35
24	0.00+00	1.41-37	2.25-37	4.77-37	9.95-37	1.92-36	3.46-36	5.85-36	9.37-36	1.44-35	2.10-35	2.90-35	3.70-35	3.95-35
23	0.00+00	1.61-37	2.58-37	5.53-37	1.16-36	2.27-36	4.13-36	7.05-36	1.14-35	1.77-35	2.62-35	3.65-35	4.59-35	4.50-35
22	0.00+00	1.85-37	2.99-37	6.47-37	1.37-36	2.71-36	4.99-36	8.63-36	1.42-35	2.23-35	3.33-35	4.66-35	5.73-35	4.64-35
21	0.00+00	2.14-37	3.50-37	7.63-37	1.64-36	3.28-36	6.10-36	1.07-35	1.79-35	2.85-35	4.33-35	6.05-35	7.05-35	3.12-35
20	0.00+00	2.50-37	4.12-37	9.09-37	1.98-36	4.01-36	7.59-36	1.35-35	2.30-35	3.74-35	5.75-35	7.98-35	8.16-35	-4.50-35
19	0.00+00	2.94-37	4.90-37	1.10-36	2.42-36	4.99-36	9.61-36	1.75-35	3.04-35	5.05-35	7.86-35	1.06-34	7.07-35	-3.65-34
18	0.00+00	3.50-37	5.90-37	1.34-36	3.01-36	6.32-36	1.24-35	2.32-35	4.15-35	7.06-35	1.11-34	1.34-34	-5.85-35	-1.89-33
17	0.00+00	4.21-37	7.19-37	1.66-36	3.81-36	8.20-36	1.66-35	3.18-35	5.87-35	1.03-34	1.59-34	1.79-34	-8.67-34	-1.24-32
16	0.00+00	5.12-37	8.90-37	2.10-36	4.94-36	1.09-35	2.28-35	4.55-35	8.72-35	1.57-34	2.22-34	-1.95-34	-7.28-33	-1.94-31
15	0.00+00	6.32-37	1.12-36	2.71-36	6.57-36	1.50-35	3.27-35	6.84-35	1.38-34	2.51-34	2.03-34	-3.66-33	-1.30-31	
14	0.00+00	7.94-37	1.44-36	3.60-36	9.04-36	2.16-35	4.96-35	1.11-34	2.36-34	3.96-34	-1.28-33	-8.07-32		
13	0.00+00	1.02-36	1.90-36	4.93-36	1.30-35	3.29-35	8.11-35	1.97-34	4.45-34	1.34-34	-4.48-32			
12	0.00+00	1.34-36	2.58-36	7.05-36	1.98-35	5.42-35	1.48-34	4.05-34	8.21-34	-2.05-32				
11	0.00+00	1.81-36	3.65-36	1.06-35	3.25-35	1.00-34	3.19-34	1.01-33	-5.77-33					
10	0.00+00	2.54-36	5.45-36	1.74-35	6.02-35	2.21-34	9.12-34	1.77-33						
9	0.00+00	3.74-36	8.73-36	3.18-35	1.34-34	6.76-34	4.44-33							
8	0.00+00	5.90-36	1.56-35	7.02-35	4.21-34	4.30-33								
7	0.00+00	1.02-35	3.30-35	2.18-34	2.98-33									
6	0.00+00	2.08-35	9.68-35	1.57-33										
5	0.00+00	5.59-35	6.38-34											
4	0.00+00	3.01-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.81-36	3.42-36	4.09-36	4.77-36	5.44-36	6.00-36	6.36-36	6.36-36	5.77-36	4.25-36	1.32-36	-3.70-36	-1.18-35	-2.44-35
45	3.49-36	3.99-36	4.35-36	4.41-36	3.95-36	2.66-36	4.75-38	-4.61-36	-1.24-35	-2.47-35	-4.41-35	-7.39-35	-1.19-34	-1.88-34
40	5.00-36	5.36-36	5.17-36	3.95-36	9.87-37	-4.85-36	-1.54-35	-3.33-35	-6.33-35	-1.12-34	-1.92-34	-3.23-34	-5.36-34	-8.91-34
35	8.25-36	8.22-36	6.35-36	9.99-37	-1.07-35	-3.37-35	-7.68-35	-1.56-34	-2.99-34	-5.63-34	-1.05-33	-1.99-33	-3.87-33	-7.86-33
30	1.55-35	1.26-35	1.33-36	-2.81-35	-9.56-35	-2.44-34	-5.69-34	-1.29-33	-2.99-33	-7.29-33	-1.96-32	-6.23-32	-2.75-31	-2.68-30
29	1.77-35	1.30-35	-4.23-36	-4.93-35	-1.56-34	-4.00-34	-9.65-34	-2.33-33	-5.87-33	-1.62-32	-5.31-32	-2.40-31	-2.42-30	
28	2.02-35	1.23-35	-1.49-35	-8.69-35	-2.64-34	-6.93-34	-1.77-33	-4.64-33	-1.33-32	-4.47-32	-2.08-31	-2.16-30		
27	2.27-35	9.24-36	-3.55-35	-1.57-34	-4.72-34	-1.29-33	-3.57-33	-1.06-32	-3.71-32	-1.79-31	-1.92-30			
26	2.48-35	1.08-36	-7.67-35	-2.97-34	-9.08-34	-2.68-33	-8.35-33	-3.03-32	-1.52-31	-1.69-30				
25	2.53-35	-1.86-35	-1.63-34	-5.99-34	-1.93-33	-6.39-33	-2.43-32	-1.27-31	-1.47-30					
24	2.09-35	-6.53-35	-3.60-34	-1.33-33	-4.75-33	-1.91-32	-1.04-31	-1.27-30						
23	2.89-36	-4.81-34	-8.54-34	-3.39-33	-1.46-32	-8.43-32	-1.08-30							
22	-5.34-35	-4.92-34	-2.31-33	-1.08-32	-6.67-32	-9.09-31								
21	-2.27-34	-1.46-33	-7.74-33	-5.15-32	-7.51-31									
20	-8.21-34	-5.25-33	-3.86-32	-6.08-31										
19	-3.32-33	-2.78-32	-4.81-31											
18	-1.91-32	-3.70-31												
17	-2.74-31													

HE + TE = 1.50+04 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 1.128-12 4-3 RC = 2.328-13 4-3 EM = 9.866-25 2S RC = 3.195-13 2P RC = 8.088-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.21-03	4.34-04	2.17-04	1.27-04	8.18-05	5.60-05	4.02-05	2.98-05	2.28-05	1.78-05	1.42-05	1.15-05	9.45-06	7.85-06
45	1.50-03	5.51-04	2.83-04	1.69-04	1.10-04	7.62-05	5.51-05	4.12-05	3.16-05	2.48-05	1.98-05	1.61-05	1.32-05	1.10-05
40	2.00-03	7.43-04	3.88-04	2.35-04	1.55-04	1.08-04	7.85-05	5.89-05	4.54-05	3.57-05	2.86-05	2.32-05	1.91-05	1.59-05
35	2.86-03	1.07-03	5.67-04	3.46-04	2.29-04	1.61-04	1.17-04	8.83-05	6.82-05	5.37-05	4.31-05	3.50-05	2.89-05	2.41-05
30	4.42-03	1.68-03	8.90-04	5.46-04	3.63-04	2.55-04	1.87-04	1.41-04	1.09-04	8.59-05	6.90-05	5.62-05	4.63-05	3.86-05
29	4.87-03	1.85-03	9.83-04	6.03-04	4.02-04	2.83-04	2.07-04	1.56-04	1.21-04	9.53-05	7.65-05	6.23-05	5.14-05	4.28-05
28	5.40-03	2.05-03	1.09-03	6.70-04	4.46-04	3.14-04	2.30-04	1.74-04	1.34-04	1.06-04	8.52-05	6.94-05	5.72-05	4.77-05
27	6.00-03	2.28-03	1.21-03	7.47-04	4.98-04	3.51-04	2.57-04	1.94-04	1.50-04	1.19-04	9.52-05	7.76-05	6.40-05	5.33-05
26	6.70-03	2.55-03	1.36-03	8.35-04	5.58-04	3.93-04	2.88-04	2.18-04	1.68-04	1.33-04	1.07-04	8.71-05	7.18-05	5.99-05
25	7.51-03	2.86-03	1.53-03	9.39-04	6.27-04	4.42-04	3.24-04	2.45-04	1.90-04	1.50-04	1.21-04	9.83-05	8.10-05	6.75-05
24	8.47-03	3.23-03	1.72-03	1.06-03	7.09-04	5.00-04	3.67-04	2.78-04	2.15-04	1.70-04	1.37-04	1.11-04	9.19-05	7.65-05
23	9.59-03	3.66-03	1.96-03	1.21-03	8.06-04	5.69-04	4.18-04	3.16-04	2.45-04	1.94-04	1.56-04	1.27-04	1.05-04	8.72-05
22	1.09-02	4.17-03	2.23-03	1.38-03	9.22-04	6.52-04	4.79-04	3.62-04	2.81-04	2.22-04	1.79-04	1.46-04	1.20-04	9.99-05
21	1.25-02	4.79-03	2.56-03	1.58-03	1.06-03	7.51-04	5.52-04	4.18-04	3.25-04	2.57-04	2.06-04	1.68-04	1.39-04	1.15-04
20	1.45-02	5.53-03	2.97-03	1.83-03	1.23-03	8.71-04	6.41-04	4.86-04	3.77-04	2.99-04	2.40-04	1.96-04	1.61-04	1.33-04
19	1.68-02	6.44-03	3.46-03	2.14-03	1.44-03	1.02-03	7.51-04	5.70-04	4.43-04	3.51-04	2.82-04	2.29-04	1.88-04	1.55-04
18	1.97-02	7.56-03	4.07-03	2.52-03	1.70-03	1.20-03	8.88-04	6.74-04	5.24-04	4.15-04	3.34-04	2.71-04	2.22-04	1.81-04
17	2.33-02	8.96-03	4.83-03	3.00-03	2.02-03	1.44-03	1.06-03	8.06-04	6.27-04	4.97-04	3.99-04	3.23-04	2.62-04	2.10-04
16	2.79-02	1.07-02	5.79-03	3.61-03	2.44-03	1.73-03	1.28-03	9.75-04	7.59-04	6.01-04	4.81-04	3.86-04	3.07-04	2.28-04
15	3.38-02	1.30-02	7.04-03	4.40-03	2.97-03	2.12-03	1.57-03	1.20-03	9.31-04	7.35-04	5.85-04	4.61-04	3.80-04	
14	4.14-02	1.60-02	8.68-03	5.43-03	3.69-03	2.64-03	1.96-03	1.49-03	1.16-03	9.11-04	7.11-04	5.21-04		
13	5.16-02	2.00-02	1.09-02	6.84-03	4.65-03	3.34-03	2.48-03	1.89-03	1.46-03	1.13-03	8.23-04			
12	6.55-02	2.54-02	1.39-02	8.78-03	6.00-03	4.31-03	3.21-03	2.45-03	1.87-03	1.35-03				
11	8.49-02	3.31-02	1.82-02	1.16-02	7.94-03	5.73-03	4.27-03	3.21-03	2.30-03					
10	1.13-01	4.42-02	2.45-02	1.57-02	1.08-02	7.85-03	5.81-03	4.12-03						
9	1.55-01	6.13-02	3.43-02	2.21-02	1.54-02	1.11-02	7.82-03							
8	2.23-01	8.87-02	5.03-02	3.29-02	2.30-02	1.60-02								
7	3.37-01	1.36-01	7.88-02	5.23-02	3.56-02									
6	5.51-01	2.27-01	1.35-01	8.93-02										
5	1.01+00	4.31-01	2.63-01											
4	2.23+00	1.00+00												
3	7.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.60-06	5.60-06	4.79-06	4.12-06	3.58-06	3.12-06	2.74-06	2.42-06	2.14-06	1.91-06	1.71-06	1.53-06	1.38-06	1.24-06
45	9.26-06	7.86-06	6.72-06	5.79-06	5.03-06	4.39-06	3.85-06	3.40-06	3.01-06	2.68-06	2.39-06	2.14-06	1.93-06	1.74-06
40	1.34-05	1.14-05	9.74-06	8.39-06	7.28-06	6.35-06	5.57-06	4.91-06	4.35-06	3.86-06	3.45-06	3.08-06	2.77-06	2.49-06
35	2.03-05	1.72-05	1.47-05	1.27-05	1.10-05	9.58-06	8.39-06	7.38-06	6.52-06	5.78-06	5.14-06	4.58-06	4.09-06	3.65-06
30	3.25-05	2.76-05	2.36-05	2.03-05	1.76-05	1.53-05	1.33-05	1.17-05	1.02-05	8.98-06	7.87-06	6.85-06	5.86-06	4.70-06
29	3.61-05	3.06-05	2.61-05	2.25-05	1.94-05	1.69-05	1.47-05	1.28-05	1.12-05	9.80-06	8.50-06	7.25-06	5.79-06	
28	4.01-05	3.41-05	2.91-05	2.50-05	2.16-05	1.87-05	1.63-05	1.42-05	1.23-05	1.06-05	9.04-06	7.19-06		
27	4.49-05	3.80-05	3.25-05	2.79-05	2.40-05	2.08-05	1.80-05	1.56-05	1.34-05	1.14-05	9.00-06			
26	5.04-05	4.27-05	3.64-05	3.12-05	2.68-05	2.31-05	1.99-05	1.71-05	1.44-05	1.14-05				
25	5.68-05	4.81-05	4.09-05	3.50-05	3.00-05	2.58-05	2.20-05	1.84-05	1.45-05					
24	6.43-05	5.44-05	4.62-05	3.94-05	3.36-05	2.85-05	2.38-05	1.86-05						
23	7.32-05	6.18-05	5.24-05	4.44-05	3.75-05	3.11-05	2.42-05							
22	8.37-05	7.05-05	5.94-05	4.99-05	4.12-05	3.19-05								
21	9.62-05	8.06-05	6.73-05	5.53-05	4.25-05									
20	1.11-04	9.20-05	7.52-05	5.74-05										
19	1.28-04	1.04-04	7.89-05											
18	1.46-04	1.10-04												
17	1.57-04													

HE + TE = 1.50+04 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.45-38	1.77-38	2.82-38	4.89-38	8.81-38	1.61-37	2.91-37	5.12-37	8.76-37	1.45-36	2.32-36	3.62-36	5.49-36
45	0.00+00	2.05-38	2.82-38	5.03-38	9.24-38	1.65-37	2.84-37	4.74-37	7.66-37	1.21-36	1.85-36	2.78-36	4.11-36	5.96-36
40	0.00+00	2.95-38	4.30-38	8.17-38	1.55-37	2.78-37	4.70-37	7.55-37	1.16-36	1.74-36	2.52-36	3.58-36	4.99-36	6.85-36
35	0.00+00	4.42-38	6.65-38	1.31-37	2.55-37	4.63-37	7.83-37	1.25-36	1.90-36	2.77-36	3.90-36	5.33-36	7.10-36	9.21-36
30	0.00+00	7.06-38	1.09-37	2.21-37	4.40-37	8.15-37	1.40-36	2.26-36	3.47-36	5.08-36	7.15-36	9.70-36	1.27-35	1.58-35
29	0.00+00	7.84-38	1.21-37	2.47-37	4.96-37	9.23-37	1.60-36	2.59-36	3.98-36	5.86-36	8.27-36	1.12-35	1.47-35	1.82-35
28	0.00+00	8.73-38	1.36-37	2.79-37	5.62-37	1.05-36	1.83-36	2.98-36	4.61-36	6.82-36	9.67-36	1.32-35	1.72-35	2.12-35
27	0.00+00	9.77-38	1.53-37	3.15-37	6.40-37	1.21-36	2.11-36	3.46-36	5.38-36	8.01-36	1.14-35	1.56-35	2.04-35	2.49-35
26	0.00+00	1.10-37	1.73-37	3.59-37	7.33-37	1.39-36	2.45-36	4.05-36	6.34-36	9.50-36	1.37-35	1.88-35	2.45-35	2.97-35
25	0.00+00	1.24-37	1.96-37	4.10-37	8.45-37	1.61-36	2.87-36	4.78-36	7.55-36	1.14-35	1.65-35	2.29-35	2.99-35	3.57-35
24	0.00+00	1.41-37	2.24-37	4.73-37	9.82-37	1.89-36	3.39-36	5.70-36	9.10-36	1.39-35	2.03-35	2.83-35	3.70-35	4.31-35
23	0.00+00	1.61-37	2.58-37	5.49-37	1.15-36	2.23-36	4.04-36	6.87-36	1.11-35	1.72-35	2.54-35	3.56-35	4.65-35	5.19-35
22	0.00+00	1.85-37	2.99-37	6.42-37	1.36-36	2.67-36	4.88-36	8.40-36	1.38-35	2.16-35	3.23-35	4.58-35	5.91-35	6.06-35
21	0.00+00	2.14-37	3.49-37	7.57-37	1.62-36	3.22-36	5.98-36	1.04-35	1.74-35	2.76-35	4.20-35	6.00-35	7.57-35	6.37-35
20	0.00+00	2.50-37	4.11-37	9.03-37	1.96-36	3.95-36	7.43-36	1.32-35	2.24-35	3.63-35	5.62-35	8.05-35	9.59-35	3.80-35
19	0.00+00	2.95-37	4.89-37	1.09-36	2.39-36	4.91-36	9.42-36	1.71-35	2.96-35	4.91-35	7.74-35	1.10-34	1.12-34	-1.15-34
18	0.00+00	3.50-37	5.88-37	1.33-36	2.98-36	6.23-36	1.22-35	2.27-35	4.04-35	6.89-35	1.10-34	1.51-34	7.64-35	-9.19-34
17	0.00+00	4.21-37	7.17-37	1.65-36	3.77-36	8.07-36	1.62-35	3.11-35	5.72-35	1.01-34	1.64-34	1.93-34	-3.10-34	-6.52-33
16	0.00+00	5.12-37	8.88-37	2.09-36	4.88-36	1.07-35	2.23-35	4.44-35	8.53-35	1.56-34	2.49-34	1.01-34	-3.70-33	-9.87-32
15	0.00+00	6.33-37	1.12-36	2.69-36	6.50-36	1.48-35	3.21-35	6.70-35	1.36-34	2.58-34	3.43-34	-1.63-33	-6.77-32	
14	0.00+00	7.95-37	1.44-36	3.57-36	8.94-36	2.13-35	4.86-35	1.08-34	2.36-34	4.51-34	-2.22-34	-4.26-32		
13	0.00+00	1.02-36	1.89-36	4.90-36	1.28-35	3.24-35	7.97-35	1.94-34	4.60-34	6.19-34	-2.33-32			
12	0.00+00	1.34-36	2.57-36	7.00-36	1.95-35	5.34-35	1.46-34	4.04-34	1.01-33	-9.65-33				
11	0.00+00	1.81-36	3.64-36	1.06-35	3.22-35	9.86-35	3.15-34	1.06-33	-9.82-34					
10	0.00+00	2.54-36	5.43-36	1.73-35	5.95-35	2.18-34	9.14-34	3.51-33						
9	0.00+00	3.74-36	8.70-36	3.16-35	1.33-34	6.68-34	4.89-33							
8	0.00+00	5.90-36	1.55-35	6.96-35	4.16-34	4.35-33								
7	0.00+00	1.02-35	3.29-35	2.16-34	2.95-33									
6	0.00+00	2.08-35	9.64-35	1.56-33										
5	0.00+00	5.59-35	6.35-34											
4	0.00+00	3.01-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.15-36	1.19-35	1.70-35	2.39-35	3.32-35	4.56-35	6.22-35	8.40-35	1.13-34	1.50-34	2.00-34	2.65-34	3.50-34	4.63-34
45	8.52-36	1.20-35	1.68-35	2.31-35	3.17-35	4.31-35	5.83-35	7.85-35	1.05-34	1.41-34	1.89-34	2.53-34	3.39-34	4.57-34
40	9.28-36	1.24-35	1.65-35	2.17-35	2.84-35	3.70-35	4.79-35	6.19-35	7.97-35	1.02-34	1.31-34	1.68-34	2.14-34	2.72-34
35	1.17-35	1.44-35	1.71-35	1.95-35	2.07-35	1.94-35	1.29-35	-3.72-36	-3.94-35	-1.11-34	-2.53-34	-5.36-34	-1.11-33	-2.35-33
30	1.85-35	1.97-35	1.67-35	4.68-36	-2.67-35	-9.86-35	-2.57-34	-6.07-34	-1.41-33	-3.37-33	-8.74-33	-2.66-32	-1.10-31	-9.99-31
29	2.09-35	2.11-35	1.46-35	-6.62-36	-6.04-35	-1.86-34	-4.73-34	-1.15-33	-2.84-33	-7.58-33	-2.36-32	-1.00-31	-9.28-31	
28	2.38-35	2.22-35	9.95-36	-2.72-35	-1.21-34	-3.49-34	-9.04-34	-2.33-33	-6.43-33	-2.06-32	-8.99-32	-8.51-31		
27	2.72-35	2.25-35	-1.30-37	-6.64-35	-2.39-34	-6.80-34	-1.86-33	-5.34-33	-1.76-32	-7.90-32	-7.73-31			
26	3.10-35	2.05-35	-2.16-35	-1.45-34	-4.83-34	-1.43-33	-4.32-33	-1.48-32	-6.87-32	-6.94-31				
25	3.47-35	1.26-35	-6.87-35	-3.15-34	-1.05-33	-3.39-33	-1.22-32	-5.88-32	-6.16-31					
24	3.68-35	-9.75-36	-1.78-34	-7.23-34	-2.57-33	-9.82-33	-4.96-32	-5.41-31						
23	3.28-35	-7.01-35	-4.54-34	-1.85-33	-7.67-33	-4.10-32	-4.69-31							
22	9.47-36	-2.40-34	-1.26-33	-5.79-33	-3.31-32	-4.02-31								
21	-7.72-35	-7.73-34	-4.18-33	-2.61-32	-3.38-31									
20	-3.95-34	-2.84-33	-1.99-32	-2.80-31										
19	-1.75-33	-1.46-32	-2.26-31											
18	-1.01-32	-1.78-31												
17	-1.36-31													

HE + TE = 1.50+04 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 1.130-12 4-3 RC = 2.313-13 4-3 EM = 9.801-25 2S RC = 3.208-13 2P RC = 8.093-13

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.92-03	6.20-04	2.80-04	1.51-04	9.16-05	5.99-05	4.14-05	2.98-05	2.23-05	1.71-05	1.34-05	1.07-05	8.68-06	7.14-06
45	2.25-03	7.52-04	3.50-04	1.94-04	1.20-04	7.94-05	5.56-05	4.05-05	3.05-05	2.35-05	1.86-05	1.49-05	1.21-05	1.00-05
40	2.68-03	9.34-04	4.52-04	2.58-04	1.63-04	1.10-04	7.82-05	5.77-05	4.38-05	3.40-05	2.70-05	2.18-05	1.78-05	1.48-05
35	3.39-03	1.23-03	6.20-04	3.66-04	2.36-04	1.62-04	1.17-04	8.69-05	6.65-05	5.20-05	4.15-05	3.36-05	2.76-05	2.29-05
30	4.81-03	1.78-03	9.29-04	5.61-04	3.69-04	2.57-04	1.86-04	1.40-04	1.07-04	8.44-05	6.75-05	5.48-05	4.50-05	3.74-05
29	5.24-03	1.95-03	1.02-03	6.18-04	4.07-04	2.84-04	2.07-04	1.55-04	1.19-04	9.38-05	7.50-05	6.09-05	5.01-05	4.16-05
28	5.73-03	2.14-03	1.12-03	6.84-04	4.52-04	3.16-04	2.30-04	1.73-04	1.33-04	1.05-04	8.37-05	6.80-05	5.59-05	4.65-05
27	6.31-03	2.37-03	1.25-03	7.60-04	5.03-04	3.52-04	2.57-04	1.93-04	1.49-04	1.17-04	9.37-05	7.61-05	6.26-05	5.20-05
26	6.99-03	2.63-03	1.39-03	8.49-04	5.63-04	3.95-04	2.88-04	2.17-04	1.67-04	1.32-04	1.05-04	8.56-05	7.04-05	5.85-05
25	7.79-03	2.94-03	1.56-03	9.52-04	6.33-04	4.44-04	3.24-04	2.44-04	1.89-04	1.48-04	1.19-04	9.66-05	7.94-05	6.60-05
24	8.73-03	3.30-03	1.75-03	1.07-03	7.15-04	5.02-04	3.67-04	2.77-04	2.14-04	1.68-04	1.35-04	1.10-04	9.01-05	7.48-05
23	9.84-03	3.73-03	1.99-03	1.22-03	8.12-04	5.71-04	4.18-04	3.15-04	2.44-04	1.92-04	1.54-04	1.25-04	1.03-04	8.53-05
22	1.12-02	4.25-03	2.26-03	1.39-03	9.29-04	6.54-04	4.79-04	3.62-04	2.79-04	2.20-04	1.77-04	1.43-04	1.18-04	9.77-05
21	1.28-02	4.86-03	2.60-03	1.60-03	1.07-03	7.53-04	5.52-04	4.17-04	3.23-04	2.54-04	2.04-04	1.66-04	1.36-04	1.12-04
20	1.47-02	5.61-03	3.00-03	1.85-03	1.24-03	8.74-04	6.41-04	4.85-04	3.75-04	2.96-04	2.37-04	1.92-04	1.58-04	1.30-04
19	1.71-02	6.53-03	3.50-03	2.16-03	1.45-03	1.02-03	7.51-04	5.68-04	4.40-04	3.47-04	2.78-04	2.25-04	1.84-04	1.51-04
18	2.00-02	7.65-03	4.11-03	2.54-03	1.71-03	1.21-03	8.88-04	6.72-04	5.20-04	4.11-04	3.29-04	2.66-04	2.16-04	1.76-04
17	2.37-02	9.07-03	4.87-03	3.02-03	2.03-03	1.44-03	1.06-03	8.03-04	6.22-04	4.91-04	3.92-04	3.16-04	2.55-04	2.04-04
16	2.83-02	1.09-02	5.85-03	3.64-03	2.45-03	1.74-03	1.28-03	9.71-04	7.52-04	5.93-04	4.72-04	3.77-04	2.99-04	2.23-04
15	3.42-02	1.31-02	7.11-03	4.43-03	2.99-03	2.12-03	1.57-03	1.19-03	9.22-04	7.24-04	5.72-04	4.49-04	3.52-04	
14	4.19-02	1.62-02	8.76-03	5.47-03	3.70-03	2.64-03	1.95-03	1.48-03	1.14-03	8.94-04	6.93-04	5.08-04		
13	5.22-02	2.02-02	1.10-02	6.88-03	4.67-03	3.34-03	2.47-03	1.87-03	1.44-03	1.11-03	8.02-04			
12	6.62-02	2.57-02	1.40-02	8.83-03	6.02-03	4.31-03	3.19-03	2.42-03	1.83-03	1.31-03				
11	8.58-02	3.34-02	1.84-02	1.16-02	7.96-03	5.72-03	4.23-03	3.16-03	2.24-03					
10	1.14-01	4.47-02	2.47-02	1.58-02	1.09-02	7.81-03	5.73-03	4.03-03						
9	1.57-01	6.19-02	3.46-02	2.22-02	1.54-02	1.10-02	7.66-03							
8	2.25-01	8.95-02	5.07-02	3.30-02	2.29-02	1.57-02								
7	3.41-01	1.37-01	7.92-02	5.22-02	3.51-02									
6	5.57-01	2.29-01	1.36-01	8.84-02										
5	1.02+00	4.34-01	2.62-01											
4	2.25+00	1.00+00												
3	7.04+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.95-06	5.01-06	4.26-06	3.65-06	3.15-06	2.74-06	2.40-06	2.11-06	1.87-06	1.66-06	1.48-06	1.33-06	1.20-06	1.08-06
45	8.39-06	7.09-06	6.04-06	5.19-06	4.49-06	3.91-06	3.43-06	3.02-06	2.67-06	2.38-06	2.12-06	1.90-06	1.71-06	1.55-06
40	1.24-05	1.05-05	8.96-06	7.71-06	6.68-06	5.82-06	5.10-06	4.50-06	3.98-06	3.54-06	3.16-06	2.83-06	2.54-06	2.29-06
35	1.92-05	1.63-05	1.39-05	1.20-05	1.04-05	9.03-06	7.91-06	6.96-06	6.15-06	5.45-06	4.85-06	4.33-06	3.87-06	3.47-06
30	3.14-05	2.66-05	2.27-05	1.95-05	1.69-05	1.46-05	1.28-05	1.12-05	9.82-06	8.63-06	7.58-06	6.62-06	5.69-06	4.61-06
29	3.50-05	2.96-05	2.52-05	2.17-05	1.87-05	1.62-05	1.41-05	1.24-05	1.08-05	9.45-06	8.22-06	7.05-06	5.68-06	
28	3.90-05	3.30-05	2.81-05	2.41-05	2.08-05	1.80-05	1.57-05	1.36-05	1.19-05	1.03-05	8.78-06	7.05-06		
27	4.37-05	3.69-05	3.15-05	2.70-05	2.32-05	2.01-05	1.74-05	1.51-05	1.30-05	1.10-05	8.83-06			
26	4.91-05	4.15-05	3.53-05	3.02-05	2.60-05	2.24-05	1.93-05	1.65-05	1.40-05	1.11-05				
25	5.53-05	4.67-05	3.97-05	3.39-05	2.91-05	2.49-05	2.13-05	1.79-05	1.42-05					
24	6.27-05	5.29-05	4.49-05	3.82-05	3.25-05	2.76-05	2.31-05	1.82-05						
23	7.13-05	6.01-05	5.08-05	4.30-05	3.63-05	3.03-05	2.37-05							
22	8.16-05	6.85-05	5.76-05	4.84-05	4.00-05	3.12-05								
21	9.37-05	7.82-05	6.52-05	5.37-05	4.15-05									
20	1.08-04	8.93-05	7.30-05	5.61-05										
19	1.24-04	1.01-04	7.70-05											
18	1.42-04	1.08-04												
17	1.53-04													

HE + TE = 1.50+04 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	9.65-39	-2.43-39	-2.68-38	-6.68-38	-1.14-37	-1.44-37	-1.07-37	8.24-38	5.50-37	1.48-36	3.14-36	5.88-36	1.02-35
45	0.00+00	1.62-38	8.08-39	-6.02-39	-2.61-38	-3.81-38	-7.34-39	1.30-37	4.78-37	1.20-36	2.51-36	4.76-36	8.38-36	1.40-35
40	0.00+00	2.68-38	2.69-38	3.32-38	5.07-38	1.01-37	2.27-37	5.05-37	1.05-36	2.06-36	3.78-36	6.61-36	1.11-35	1.79-35
35	0.00+00	4.36-38	5.70-38	9.71-38	1.77-37	3.26-37	5.97-37	1.07-36	1.88-36	3.20-36	5.33-36	8.66-36	1.38-35	2.16-35
30	0.00+00	7.15-38	1.05-37	2.00-37	3.86-37	7.08-37	1.23-36	2.06-36	3.31-36	5.17-36	7.92-36	1.19-35	1.77-35	2.62-35
29	0.00+00	7.94-38	1.18-37	2.29-37	4.45-37	8.18-37	1.42-36	2.36-36	3.76-36	5.81-36	8.77-36	1.30-35	1.90-35	2.76-35
28	0.00+00	8.84-38	1.33-37	2.61-37	5.12-37	9.46-37	1.64-36	2.71-36	4.30-36	6.59-36	9.83-36	1.44-35	2.07-35	2.94-35
27	0.00+00	9.88-38	1.50-37	2.99-37	5.91-37	1.10-36	1.91-36	3.15-36	4.96-36	7.55-36	1.12-35	1.61-35	2.28-35	3.17-35
26	0.00+00	1.11-37	1.70-37	3.43-37	6.84-37	1.28-36	2.23-36	3.67-36	5.78-36	8.77-36	1.29-35	1.84-35	2.55-35	3.45-35
25	0.00+00	1.25-37	1.94-37	3.94-37	7.94-37	1.49-36	2.62-36	4.33-36	6.82-36	1.03-35	1.51-35	2.13-35	2.91-35	3.80-35
24	0.00+00	1.42-37	2.22-37	4.56-37	9.26-37	1.75-36	3.10-36	5.15-36	8.15-36	1.24-35	1.80-35	2.53-35	3.38-35	4.20-35
23	0.00+00	1.62-37	2.55-37	5.31-37	1.09-36	2.08-36	3.70-36	6.20-36	9.87-36	1.50-35	2.19-35	3.06-35	3.99-35	4.63-35
22	0.00+00	1.86-37	2.96-37	6.22-37	1.29-36	2.49-36	4.48-36	7.57-36	1.22-35	1.86-35	2.73-35	3.78-35	4.78-35	4.90-35
21	0.00+00	2.15-37	3.45-37	7.35-37	1.54-36	3.01-36	5.48-36	9.38-36	1.53-35	2.36-35	3.48-35	4.79-35	5.75-35	4.45-35
20	0.00+00	2.51-37	4.07-37	8.77-37	1.86-36	3.69-36	6.82-36	1.18-35	1.95-35	3.07-35	4.56-35	6.19-35	6.75-35	1.29-35
19	0.00+00	2.95-37	4.84-37	1.06-36	2.28-36	4.60-36	8.64-36	1.53-35	2.57-35	4.11-35	6.16-35	8.14-35	6.90-35	-1.24-34
18	0.00+00	3.51-37	5.82-37	1.29-36	2.84-36	5.83-36	1.12-35	2.02-35	3.48-35	5.69-35	8.59-35	1.06-34	2.00-35	-7.43-34
17	0.00+00	4.22-37	7.10-37	1.61-36	3.60-36	7.56-36	1.49-35	2.77-35	4.91-35	8.22-35	1.24-34	1.20-34	-3.12-34	-4.58-33
16	0.00+00	5.13-37	8.78-37	2.03-36	4.67-36	1.01-35	2.04-35	3.94-35	7.25-35	1.25-34	1.79-34	7.54-36	-2.79-33	-5.95-32
15	0.00+00	6.34-37	1.11-36	2.62-36	6.21-36	1.38-35	2.92-35	5.90-35	1.14-34	2.01-34	2.20-34	-1.36-33	-4.30-32	
14	0.00+00	7.96-37	1.42-36	3.48-36	8.54-36	1.99-35	4.42-35	9.47-35	1.94-34	3.34-34	-3.13-34	-2.88-32		
13	0.00+00	1.02-36	1.87-36	4.76-36	1.23-35	3.02-35	7.20-35	1.68-34	3.68-34	3.81-34	-1.69-32			
12	0.00+00	1.34-36	2.55-36	6.80-36	1.86-35	4.96-35	1.30-34	3.42-34	7.53-34	-7.74-33				
11	0.00+00	1.81-36	3.60-36	1.03-35	3.06-35	9.10-35	2.78-34	8.63-34	-1.33-33					
10	0.00+00	2.54-36	5.37-36	1.67-35	5.63-35	1.99-34	7.85-34	2.44-33						
9	0.00+00	3.75-36	8.60-36	3.06-35	1.25-34	6.00-34	3.92-33							
8	0.00+00	5.91-36	1.53-35	6.71-35	3.87-34	3.74-33								
7	0.00+00	1.03-35	3.24-35	2.07-34	2.68-33									
6	0.00+00	2.08-35	9.46-35	1.47-33										
5	0.00+00	5.59-35	6.18-34											
4	0.00+00	3.00-34												
3	0.00+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.67-35	2.62-35	4.00-35	5.94-35	8.64-35	1.23-34	1.74-34	2.43-34	3.35-34	4.59-34	6.25-34	8.46-34	1.14-33	1.54-33
45	2.25-35	3.49-35	5.30-35	7.87-35	1.15-34	1.66-34	2.36-34	3.33-34	4.68-34	6.53-34	9.10-34	1.27-33	1.76-33	2.46-33
40	2.83-35	4.35-35	6.59-35	9.82-35	1.45-34	2.11-34	3.07-34	4.43-34	6.40-34	9.24-34	1.34-33	1.95-33	2.86-33	4.26-33
35	3.32-35	5.06-35	7.64-35	1.15-34	1.71-34	2.56-34	3.84-34	5.77-34	8.76-34	1.35-33	2.11-33	3.39-33	5.64-33	9.86-33
30	3.84-35	5.63-35	8.26-35	1.22-34	1.81-34	2.73-34	4.18-34	6.55-34	1.06-33	1.81-33	3.33-33	7.09-33	2.09-32	1.59-31
29	3.98-35	5.72-35	8.22-35	1.19-34	1.72-34	2.52-34	3.71-34	5.54-34	8.34-34	1.25-33	1.79-33	1.95-33	3.97-33	
28	4.14-35	5.78-35	8.01-35	1.10-34	1.49-34	1.96-34	2.40-34	2.28-34	-4.56-35	-1.54-33	-1.00-32	-9.63-32		
27	4.32-35	5.75-35	7.43-35	9.05-35	9.62-35	6.03-35	-1.17-34	-7.89-34	-3.45-33	-1.71-32	-1.57-31			
26	4.49-35	5.52-35	6.05-35	4.68-35	-2.64-35	-2.82-34	-1.14-33	-4.38-33	-2.06-32	-1.91-31				
25	4.61-35	4.81-35	2.92-35	-5.32-35	-3.27-34	-1.23-33	-4.61-33	-2.17-32	-2.04-31					
24	4.52-35	2.96-35	-4.45-35	-2.99-34	-1.15-33	-.40-33	-2.11-32	-2.04-31						
23	3.84-35	-1.78-35	-2.30-34	-9.78-34	-3.91-33	-1.94-32	-1.94-31							
22	1.45-35	-1.45-34	-7.56-34	-3.28-33	-1.71-32	-1.79-31								
21	-6.03-35	-5.24-34	-2.58-33	-1.45-32	-1.60-31									
20	-3.08-34	-1.90-33	-1.18-32	-1.40-31										
19	-1.28-33	-9.13-33	-1.18-31											
18	-6.71-33	-9.76-32												
17	-7.78-32													

HE + TE = 1.50+04 NE = 1.00+05 CASE B NC = 70

TOTAL RC = 1.134-12 4-3 RC = 2.286-13 4-3 EM = 9.687-25 2S RC = 3.232-13 2P RC = 8.106-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.61-03	8.06-04	3.49-04	1.82-04	1.07-04	6.81-05	4.61-05	3.26-05	2.39-05	1.81-05	1.40-05	1.11-05	8.90-06	7.26-06
45	3.28-03	1.02-03	4.45-04	2.34-04	1.38-04	8.82-05	5.99-05	4.26-05	3.13-05	2.37-05	1.84-05	1.46-05	1.18-05	9.61-06
40	4.18-03	1.32-03	5.84-04	3.10-04	1.85-04	1.19-04	8.17-05	5.85-05	4.33-05	3.30-05	2.57-05	2.04-05	1.65-05	1.35-05
35	5.28-03	1.72-03	7.82-04	4.26-04	2.59-04	1.70-04	1.18-04	8.52-05	6.37-05	4.89-05	3.84-05	3.07-05	2.50-05	2.06-05
30	6.67-03	2.29-03	1.10-03	6.19-04	3.88-04	2.60-04	1.84-04	1.35-04	1.02-04	7.92-05	6.27-05	5.05-05	4.12-05	3.41-05
29	7.04-03	2.45-03	1.18-03	6.75-04	4.26-04	2.87-04	2.04-04	1.50-04	1.14-04	8.83-05	7.00-05	5.64-05	4.61-05	3.81-05
28	7.46-03	2.63-03	1.28-03	7.39-04	4.69-04	3.18-04	2.26-04	1.67-04	1.27-04	9.88-05	7.84-05	6.32-05	5.17-05	4.28-05
27	7.95-03	2.83-03	1.40-03	8.13-04	5.20-04	3.54-04	2.53-04	1.87-04	1.43-04	1.11-04	8.82-05	7.12-05	5.83-05	4.83-05
26	8.53-03	3.07-03	1.54-03	9.00-04	5.79-04	3.96-04	2.84-04	2.11-04	1.61-04	1.25-04	9.97-05	8.06-05	6.60-05	5.46-05
25	9.22-03	3.35-03	1.70-03	1.00-03	6.48-04	4.45-04	3.20-04	2.38-04	1.82-04	1.42-04	1.13-04	9.15-05	7.49-05	6.20-05
24	1.01-02	3.68-03	1.88-03	1.12-03	7.30-04	5.04-04	3.63-04	2.71-04	2.07-04	1.62-04	1.29-04	1.04-04	8.54-05	7.07-05
23	1.11-02	4.09-03	2.11-03	1.26-03	8.27-04	5.73-04	4.14-04	3.09-04	2.37-04	1.86-04	1.48-04	1.20-04	9.78-05	8.09-05
22	1.23-02	4.57-03	2.38-03	1.44-03	9.43-04	6.56-04	4.75-04	3.56-04	2.73-04	2.14-04	1.70-04	1.38-04	1.13-04	9.30-05
21	1.38-02	5.17-03	2.71-03	1.64-03	1.08-03	7.55-04	5.49-04	4.11-04	3.16-04	2.47-04	1.97-04	1.59-04	1.30-04	1.07-04
20	1.57-02	5.89-03	3.11-03	1.89-03	1.25-03	8.76-04	6.38-04	4.79-04	3.68-04	2.88-04	2.30-04	1.86-04	1.51-04	1.25-04
19	1.80-02	6.80-03	3.60-03	2.20-03	1.46-03	1.03-03	7.47-04	5.62-04	4.32-04	3.39-04	2.70-04	2.17-04	1.77-04	1.45-04
18	2.09-02	7.92-03	4.21-03	2.59-03	1.72-03	1.21-03	8.84-04	6.65-04	5.11-04	4.01-04	3.19-04	2.56-04	2.08-04	1.69-04
17	2.45-02	9.33-03	4.98-03	3.07-03	2.05-03	1.44-03	1.06-03	7.96-04	6.11-04	4.79-04	3.80-04	3.04-04	2.45-04	1.99-04
16	2.92-02	1.11-02	5.97-03	3.69-03	2.47-03	1.74-03	1.27-03	9.60-04	7.39-04	5.78-04	4.57-04	3.63-04	2.86-04	2.13-04
15	3.51-02	1.35-02	7.24-03	4.49-03	3.01-03	2.13-03	1.56-03	1.17-03	9.03-04	7.04-04	5.52-04	4.31-04	3.18-04	
14	4.30-02	1.65-02	8.91-03	5.54-03	3.73-03	2.64-03	1.94-03	1.46-03	1.12-03	8.66-04	6.67-04	4.87-04		
13	5.34-02	2.06-02	1.12-02	6.96-03	4.70-03	3.33-03	2.45-03	1.84-03	1.40-03	1.07-03	7.70-04			
12	6.77-02	2.62-02	1.42-02	8.93-03	6.04-03	4.30-03	3.16-03	2.36-03	1.77-03	1.26-03				
11	8.76-02	3.40-02	1.86-02	1.17-02	7.98-03	5.68-03	4.16-03	3.07-03	2.16-03					
10	1.17-01	4.55-02	2.51-02	1.59-02	1.09-02	7.73-03	5.60-03	3.88-03						
9	1.60-01	6.30-02	3.50-02	2.24-02	1.53-02	1.09-02	7.42-03							
8	2.30-01	9.11-02	5.13-02	3.31-02	2.27-02	1.52-02								
7	3.48-01	1.40-01	7.99-02	5.21-02	3.43-02									
6	5.68-01	2.33-01	1.36-01	8.70-02										
5	1.04+00	4.39-01	2.59-01											
4	2.29+00	1.00+00												
3	7.11+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.00-06	5.02-06	4.24-06	3.61-06	3.11-06	2.69-06	2.34-06	2.05-06	1.81-06	1.60-06	1.43-06	1.28-06	1.14-06	1.03-06
45	7.96-06	6.66-06	5.64-06	4.81-06	4.14-06	3.58-06	3.12-06	2.74-06	2.42-06	2.14-06	1.91-06	1.71-06	1.53-06	1.38-06
40	1.12-05	9.44-06	8.00-06	6.84-06	5.89-06	5.11-06	4.46-06	3.92-06	3.46-06	3.07-06	2.73-06	2.45-06	2.20-06	1.98-06
35	1.71-05	1.44-05	1.23-05	1.05-05	9.08-06	7.89-06	6.90-06	6.06-06	5.35-06	4.75-06	4.23-06	3.78-06	3.38-06	3.04-06
30	2.85-05	2.41-05	2.05-05	1.76-05	1.52-05	1.32-05	1.15-05	1.01-05	8.88-06	7.83-06	6.90-06	6.05-06	5.24-06	4.27-06
29	3.19-05	2.69-05	2.29-05	1.97-05	1.70-05	1.47-05	1.29-05	1.13-05	9.87-06	8.66-06	7.57-06	6.52-06	5.30-06	
28	3.58-05	3.03-05	2.58-05	2.21-05	1.91-05	1.65-05	1.44-05	1.25-05	1.10-05	9.53-06	8.17-06	6.61-06		
27	4.04-05	3.41-05	2.90-05	2.49-05	2.14-05	1.85-05	1.6.-05	1.40-05	1.21-05	1.03-05	8.31-06			
26	4.57-05	3.86-05	3.28-05	2.80-05	2.41-05	2.08-05	1.80-05	1.55-05	1.31-05	1.05-05				
25	5.19-05	4.37-05	3.71-05	3.17-05	2.72-05	2.33-05	2.00-05	1.69-05	1.34-05					
24	5.91-05	4.97-05	4.21-05	3.59-05	3.06-05	2.60-05	2.19-05	1.73-05						
23	6.75-05	5.68-05	4.79-05	4.06-05	3.43-05	2.86-05	2.26-05							
22	7.75-05	6.49-05	5.46-05	4.58-05	3.80-05	2.97-05								
21	8.92-05	7.44-05	6.20-05	5.10-05	3.97-05									
20	1.03-04	8.50-05	6.95-05	5.36-05										
19	1.19-04	9.62-05	7.37-05											
18	1.35-04	1.03-04												
17	1.47-04													

HE + TE = 1.50+04 NE = 1.00+05 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	4.66-39	-2.29-38	-8.49-38	-2.00-37	-3.78-37	-6.15-37	-8.87-37	-1.14-36	-1.28-36	-1.16-36	-5.67-37	7.86-37	3.30-36
45	0.00+00	8.70-39	-2.20-38	-8.93-38	-2.10-37	-3.84-37	-5.91-37	-7.70-37	-8.10-37	-5.31-37	3.45-37	2.22-36	5.67-36	1.15-35
40	0.00+00	1.62-38	-1.63-38	-8.49-38	-2.02-37	-3.58-37	-5.01-37	-5.25-37	-2.36-37	6.75-37	2.69-36	6.51-36	1.32-35	2.41-35
35	0.00+00	3.17-38	4.81-39	-4.71-38	-1.28-37	-2.04-37	-1.86-37	1.04-37	9.77-37	2.94-36	6.78-36	1.37-35	2.56-35	4.51-35
30	0.00+00	6.33-38	5.88-38	6.37-38	9.36-38	2.14-37	5.67-37	1.42-36	3.23-36	6.77-36	1.33-35	2.47-35	4.44-35	7.73-35
29	0.00+00	7.26-38	7.53-38	9.86-38	1.63-37	3.43-37	7.92-37	1.79-36	3.84-36	7.76-36	1.49-35	2.74-35	4.89-35	8.53-35
28	0.00+00	8.31-38	9.44-38	1.39-37	2.44-37	4.91-37	1.05-36	2.21-36	4.51-36	8.82-36	1.66-35	3.02-35	5.37-35	9.38-35
27	0.00+00	9.51-38	1.16-37	1.86-37	3.38-37	6.63-37	1.34-36	2.69-36	5.26-36	1.00-35	1.85-35	3.33-35	5.89-35	1.03-34
26	0.00+00	1.09-37	1.41-37	2.39-37	4.45-37	8.61-37	1.68-36	3.24-36	6.12-36	1.13-35	2.05-35	3.66-35	6.45-35	1.13-34
25	0.00+00	1.24-37	1.69-37	3.00-37	5.69-37	1.09-36	2.07-36	3.88-36	7.12-36	1.28-35	2.29-35	4.03-35	7.08-35	1.24-34
24	0.00+00	1.43-37	2.01-37	3.71-37	7.15-37	1.36-36	2.54-36	4.64-36	8.31-36	1.47-35	2.56-35	4.46-35	7.78-35	1.37-34
23	0.00+00	1.64-37	2.38-37	4.53-37	8.88-37	1.69-36	3.12-36	5.57-36	9.77-36	1.69-35	2.90-35	4.97-35	8.60-35	1.51-34
22	0.00+00	1.89-37	2.82-37	5.51-37	1.09-36	2.09-36	3.82-36	6.75-36	1.16-35	1.97-35	3.32-35	5.61-35	9.57-35	1.66-34
21	0.00+00	2.18-37	3.34-37	6.68-37	1.35-36	2.59-36	4.72-36	8.27-36	1.41-35	2.35-35	3.89-35	6.43-35	1.07-34	1.81-34
20	0.00+00	2.54-37	3.96-37	8.11-37	1.66-36	3.22-36	5.89-36	1.03-35	1.74-35	2.87-35	4.67-35	7.49-35	1.19-34	1.85-34
19	0.00+00	2.99-37	4.74-37	9.90-37	2.06-36	4.05-36	7.47-36	1.31-35	2.22-35	3.63-35	5.77-35	8.86-35	1.26-34	1.35-34
18	0.00+00	3.54-37	5.72-37	1.22-36	2.59-36	5.16-36	9.66-36	1.71-35	2.92-35	4.76-35	7.39-35	1.03-34	9.77-35	-1.90-34
17	0.00+00	4.25-37	6.97-37	1.52-36	3.30-36	6.71-36	1.28-35	2.31-35	3.99-35	6.52-35	9.71-35	1.05-34	-1.23-34	-2.35-33
16	0.00+00	5.16-37	8.63-37	1.93-36	4.28-36	8.94-36	1.75-35	3.25-35	5.73-35	9.39-35	1.26-34	-9.83-37	-1.73-33	-3.22-32
15	0.00+00	6.37-37	1.09-36	2.49-36	5.71-36	1.23-35	2.50-35	4.81-35	8.74-35	1.41-34	1.21-34	-1.03-33	-2.56-32	
14	0.00+00	7.99-37	1.40-36	3.31-36	7.85-36	1.76-35	3.75-35	7.60-35	1.44-34	2.11-34	-3.83-34	-1.87-32		
13	0.00+00	1.02-36	1.84-36	4.53-36	1.13-35	2.67-35	6.05-35	1.31-34	2.57-34	1.23-34	-1.21-32			
12	0.00+00	1.34-36	2.50-36	6.47-36	1.71-35	4.36-35	1.08-34	2.59-34	4.55-34	-6.44-33				
11	0.00+00	1.82-36	3.53-36	9.75-36	2.80-35	7.93-35	2.25-34	6.09-34	-1.95-33					
10	0.00+00	2.55-36	5.26-36	1.59-35	5.12-35	1.71-34	6.09-34	1.11-33						
9	0.00+00	3.76-36	8.42-36	2.89-35	1.12-34	5.00-34	2.67-33							
8	0.00+00	5.92-36	1.50-35	6.30-35	3.42-34	2.92-33								
7	0.00+00	1.03-35	3.16-35	1.92-34	2.28-33									
6	0.00+00	2.08-35	9.16-35	1.33-33										
5	0.00+00	5.59-35	5.90-34											
4	0.00+00	2.99-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.49-36	1.41-35	2.38-35	3.79-35	5.77-35	8.47-35	1.21-34	1.69-34	2.31-34	3.10-34	4.11-34	5.35-34	6.88-34	8.72-34
45	2.07-35	3.48-35	5.58-35	8.61-35	1.29-34	1.89-34	2.73-34	3.87-34	5.41-34	7.50-34	1.03-33	1.40-33	1.90-33	2.57-33
40	4.15-35	6.83-35	1.09-34	1.68-34	2.55-34	3.81-34	5.63-34	8.25-34	1.20-33	1.74-33	2.52-33	3.66-33	5.34-33	7.86-33
35	7.64-35	1.26-34	2.02-34	3.20-34	5.00-34	7.77-34	1.20-33	1.87-33	2.92-33	4.61-33	7.40-33	1.22-32	2.07-32	3.70-32
30	1.32-34	2.22-34	3.70-34	6.17-34	1.03-33	1.74-33	3.01-33	5.34-33	9.93-33	1.97-32	4.35-32	1.14-31	4.09-31	3.21-30
29	1.46-34	2.48-34	4.19-34	7.10-34	1.21-33	2.11-33	3.78-33	7.08-33	1.41-32	3.13-32	8.19-32	2.95-31	2.31-30	
28	1.62-34	2.77-34	4.76-34	8.22-34	1.44-33	2.61-33	4.91-33	9.84-33	2.18-32	5.71-32	2.05-31	1.60-30		
27	1.79-34	3.10-34	5.42-34	9.60-34	1.75-33	3.30-33	6.65-33	1.48-32	3.86-32	1.38-31	1.07-30			
26	1.98-34	3.48-34	6.22-34	1.14-33	2.16-33	4.35-33	9.66-33	2.51-32	8.90-32	6.81-31				
25	2.19-34	3.93-34	7.20-34	1.37-33	2.76-33	6.09-33	1.57-32	5.50-32	4.14-31					
24	2.44-34	4.45-34	8.41-34	1.68-33	3.67-33	9.32-33	3.17-32	2.32-31						
23	2.71-34	5.03-34	9.86-34	2.10-33	5.13-33	1.66-32	1.13-31							
22	2.98-34	5.60-34	1.13-33	2.54-33	7.20-33	3.98-32								
21	3.14-34	5.61-34	1.02-33	1.68-33	-3.70-33									
20	2.65-34	2.26-34	-1.23-33	-2.72-32										
19	-1.16-34	-2.48-33	-3.76-32											
18	-2.71-33	-4.00-32												
17	-3.74-32													

HE + TE = 1.50+04 NE = 1.00+06 CASE B NC = 70

TOTAL RC = 1.141-12 4-3 RC = 2.246-13 4-3 EM = 9.517-25 2S RC = 3.277-13 2P RC = 8.136-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.53-03	1.09-03	4.67-04	2.42-04	1.41-04	8.97-05	6.04-05	4.26-05	3.12-05	2.35-05	1.81-05	1.43-05	1.15-05	9.33-06
45	4.35-03	1.34-03	5.76-04	2.99-04	1.75-04	1.11-04	7.47-05	5.27-05	3.86-05	2.91-05	2.25-05	1.77-05	1.42-05	1.16-05
40	5.48-03	1.69-03	7.29-04	3.79-04	2.22-04	1.41-04	9.51-05	6.72-05	4.92-05	3.71-05	2.87-05	2.27-05	1.82-05	1.48-05
35	7.26-03	2.25-03	9.76-04	5.10-04	3.00-04	1.91-04	1.29-04	9.17-05	6.73-05	5.09-05	3.94-05	3.11-05	2.50-05	2.04-05
30	1.01-02	3.17-03	1.39-03	7.37-04	4.38-04	2.82-04	1.92-04	1.37-04	1.01-04	7.69-05	5.98-05	4.75-05	3.83-05	3.13-05
29	1.08-02	3.40-03	1.50-03	7.99-04	4.76-04	3.07-04	2.10-04	1.50-04	1.11-04	8.46-05	6.59-05	5.24-05	4.23-05	3.46-05
28	1.15-02	3.66-03	1.63-03	8.69-04	5.20-04	3.37-04	2.31-04	1.66-04	1.23-04	9.36-05	7.30-05	5.81-05	4.70-05	3.85-05
27	1.23-02	3.94-03	1.77-03	9.48-04	5.70-04	3.71-04	2.55-04	1.83-04	1.36-04	1.04-04	8.14-05	6.48-05	5.25-05	4.31-05
26	1.31-02	4.25-03	1.92-03	1.04-03	6.28-04	4.10-04	2.83-04	2.04-04	1.52-04	1.17-04	9.13-05	7.28-05	5.90-05	4.85-05
25	1.40-02	4.58-03	2.09-03	1.14-03	6.95-04	4.56-04	3.17-04	2.29-04	1.71-04	1.31-04	1.03-04	8.24-05	6.69-05	5.50-05
24	1.50-02	4.96-03	2.29-03	1.26-03	7.73-04	5.11-04	3.56-04	2.59-04	1.94-04	1.49-04	1.17-04	9.39-05	7.63-05	6.28-05
23	1.60-02	5.39-03	2.52-03	1.40-03	8.67-04	5.76-04	4.04-04	2.94-04	2.21-04	1.71-04	1.34-04	1.08-04	8.76-05	7.22-05
22	1.72-02	5.87-03	2.79-03	1.57-03	9.79-04	6.55-04	4.61-04	3.38-04	2.55-04	1.97-04	1.55-04	1.25-04	1.01-04	8.35-05
21	1.86-02	6.45-03	3.11-03	1.77-03	1.11-03	7.51-04	5.32-04	3.91-04	2.95-04	2.29-04	1.81-04	1.45-04	1.18-04	9.72-05
20	2.03-02	7.14-03	3.50-03	2.02-03	1.28-03	8.69-04	6.18-04	4.56-04	3.46-04	2.68-04	2.12-04	1.70-04	1.38-04	1.14-04
19	2.23-02	7.98-03	3.98-03	2.32-03	1.49-03	1.02-03	7.25-04	5.37-04	4.08-04	3.17-04	2.51-04	2.01-04	1.63-04	1.33-04
18	2.49-02	9.03-03	4.57-03	2.70-03	1.75-03	1.20-03	8.60-04	6.38-04	4.86-04	3.78-04	2.98-04	2.39-04	1.93-04	1.57-04
17	2.82-02	1.04-02	5.33-03	3.18-03	2.07-03	1.43-03	1.03-03	7.65-04	5.83-04	4.53-04	3.58-04	2.85-04	2.29-04	1.82-04
16	3.26-02	1.21-02	6.29-03	3.79-03	2.49-03	1.73-03	1.25-03	9.28-04	7.08-04	5.49-04	4.32-04	3.41-04	2.69-04	2.00-04
15	3.84-02	1.44-02	7.55-03	4.59-03	3.03-03	2.11-03	1.53-03	1.14-03	8.67-04	6.71-04	5.23-04	4.06-04	3.00-04	
14	4.61-02	1.74-02	9.23-03	5.65-03	3.75-03	2.62-03	1.90-03	1.42-03	1.07-03	8.25-04	6.32-04	4.60-04		
13	5.65-02	2.15-02	1.15-02	7.08-03	4.72-03	3.31-03	2.40-03	1.78-03	1.35-03	1.02-03	7.29-04			
12	7.09-02	2.72-02	1.46-02	9.06-03	6.06-03	4.26-03	3.09-03	2.28-03	1.69-03	1.20-03				
11	9.12-02	3.52-02	1.91-02	1.19-02	7.98-03	5.61-03	4.05-03	2.95-03	2.05-03					
10	1.21-01	4.69-02	2.56-02	1.61-02	1.08-02	7.60-03	5.41-03	3.70-03						
9	1.66-01	6.48-02	3.57-02	2.25-02	1.52-02	1.06-02	7.10-03							
8	2.37-01	9.36-02	5.21-02	3.31-02	2.23-02	1.47-02								
7	3.59-01	1.43-01	8.09-02	5.17-02	3.32-02									
6	5.86-01	2.38-01	1.37-01	8.49-02										
5	1.07+00	4.46-01	2.56-01											
4	2.35+00	1.00+00												
3	7.23+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.70-06	6.43-06	5.42-06	4.61-06	3.96-06	3.42-06	2.98-06	2.61-06	2.29-06	2.03-06	1.81-06	1.61-06	1.45-06	1.30-06
45	9.56-06	7.98-06	6.73-06	5.73-06	4.91-06	4.25-06	3.70-06	3.24-06	2.85-06	2.52-06	2.24-06	2.00-06	1.79-06	1.61-06
40	1.22-05	1.02-05	8.63-06	7.34-06	6.30-06	5.45-06	4.74-06	4.15-06	3.66-06	3.23-06	2.87-06	2.56-06	2.30-06	2.07-06
35	1.69-05	1.41-05	1.19-05	1.02-05	8.72-06	7.54-06	6.57-06	5.75-06	5.06-06	4.47-06	3.97-06	3.54-06	3.16-06	2.83-06
30	2.60-05	2.18-05	1.84-05	1.57-05	1.35-05	1.17-05	1.02-05	8.88-06	7.79-06	6.86-06	6.04-06	5.30-06	4.60-06	3.76-06
29	2.87-05	2.41-05	2.04-05	1.74-05	1.49-05	1.29-05	1.12-05	9.82-06	8.60-06	7.55-06	6.66-06	5.70-06	4.65-06	
28	3.20-05	2.68-05	2.27-05	1.94-05	1.66-05	1.44-05	1.25-05	1.09-05	9.52-06	8.29-06	7.13-06	5.80-06		
27	3.58-05	3.00-05	2.54-05	2.17-05	1.87-05	1.61-05	1.40-05	1.21-05	1.05-05	9.02-06	7.30-06			
26	4.03-05	3.39-05	2.87-05	2.45-05	2.10-05	1.81-05	1.57-05	1.35-05	1.15-05	9.29-06				
25	4.57-05	3.84-05	3.25-05	2.77-05	2.38-05	2.04-05	1.75-05	1.49-05	1.19-05					
24	5.22-05	4.39-05	3.71-05	3.16-05	2.70-05	2.30-05	1.94-05	1.55-05						
23	6.00-05	5.04-05	4.26-05	3.61-05	3.06-05	2.57-05	2.04-05							
22	6.94-05	5.81-05	4.89-05	4.12-05	3.43-05	2.71-05								
21	8.06-05	6.73-05	5.62-05	4.65-05	3.64-05									
20	9.39-05	7.78-05	6.38-05	4.95-05										
19	1.09-04	8.89-05	6.84-05											
18	1.26-04	9.61-05												
17	1.37-04													

HE + TE = 1.50+04 NE = 1.00+06 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.74-39	-5.13-38	-1.74-37	-4.27-37	-8.82-37	-1.63-36	-2.77-36	-4.46-36	-6.86-36	-1.02-35	-1.48-35	-2.12-35	-2.98-35
45	0.00+00	1.32-39	-5.47-38	-1.91-37	-4.65-37	-9.46-37	-1.71-36	-2.85-36	-4.46-36	-6.67-36	-9.65-36	-1.36-35	-1.89-35	-2.61-35
40	0.00+00	7.29-39	-5.50-38	-2.02-37	-4.87-37	-9.64-37	-1.68-36	-2.65-36	-3.90-36	-5.39-36	-7.08-36	-8.89-36	-1.08-35	-1.27-35
35	0.00+00	1.79-38	-5.33-38	-2.14-37	-5.14-37	-9.77-37	-1.59-36	-2.27-36	-2.83-36	-2.96-36	-2.11-36	4.92-37	5.96-36	1.58-35
30	0.00+00	3.99-38	-3.94-38	-2.11-37	-5.11-37	-9.22-37	-1.32-36	-1.43-36	-6.93-37	1.87-36	7.90-36	2.00-35	4.24-35	8.15-35
29	0.00+00	4.71-38	-3.19-38	-2.00-37	-4.91-37	-8.69-37	-1.19-36	-1.09-36	8.25-38	3.54-36	1.13-35	2.67-35	5.51-35	1.05-34
28	0.00+00	5.66-38	-2.14-38	-1.83-37	-4.57-37	-7.90-37	-9.97-37	-6.55-37	1.05-36	5.58-36	1.54-35	3.48-35	7.07-35	1.35-34
27	0.00+00	6.68-38	-7.17-39	-1.58-37	-4.05-37	-6.77-37	-7.42-37	-9.10-38	2.26-36	8.10-36	2.05-35	4.49-35	9.02-35	1.72-34
26	0.00+00	7.99-38	1.18-38	-1.23-37	-3.32-37	-5.20-37	-4.06-37	6.23-37	3.75-36	1.12-35	2.67-35	5.72-35	1.15-34	2.20-34
25	0.00+00	9.58-38	3.65-38	-7.40-38	-2.31-37	-3.11-37	2.69-38	1.52-36	5.58-36	1.49-35	3.43-35	7.24-35	1.45-34	2.82-34
24	0.00+00	1.15-37	6.83-38	-9.35-39	-9.80-38	-4.01-38	5.73-37	2.61-36	7.79-36	1.94-35	4.34-35	9.11-35	1.84-34	3.63-34
23	0.00+00	1.39-37	1.09-37	7.42-38	7.45-38	3.05-37	1.25-36	3.95-36	1.04-35	2.47-35	5.44-35	1.14-34	2.33-34	4.70-34
22	0.00+00	1.68-37	1.59-37	1.81-37	2.94-37	7.39-37	2.09-36	5.56-36	1.36-35	3.11-35	6.76-35	1.43-34	2.96-34	6.17-34
21	0.00+00	2.02-37	2.21-37	3.13-37	5.69-37	1.28-36	3.12-36	7.52-36	1.74-35	3.88-35	8.40-35	1.79-34	3.81-34	8.27-34
20	0.00+00	2.44-37	2.96-37	4.77-37	9.12-37	1.96-36	4.40-36	9.94-36	2.21-35	4.83-35	1.04-34	2.26-34	5.00-34	1.15-33
19	0.00+00	2.94-37	3.88-37	6.81-37	1.34-36	2.81-36	6.01-36	1.30-35	2.79-35	6.02-35	1.31-34	2.90-34	6.72-34	1.68-33
18	0.00+00	3.55-37	5.01-37	9.36-37	1.89-36	3.90-36	8.10-36	1.69-35	3.55-35	7.57-35	1.66-34	3.61-34	9.44-34	2.67-33
17	0.00+00	4.30-37	6.40-37	1.26-36	2.60-36	5.35-36	1.09-35	2.22-35	4.59-35	9.74-35	2.17-34	5.19-34	1.41-33	4.87-33
16	0.00+00	5.25-37	8.16-37	1.67-36	3.55-36	7.35-36	1.49-35	3.01-35	6.14-35	1.30-34	2.91-34	7.24-34	2.15-33	9.38-33
15	0.00+00	6.49-37	1.04-36	2.23-36	4.87-36	1.03-35	2.10-35	4.24-35	8.62-35	1.80-34	3.94-34	8.52-34	-1.18-33	
14	0.00+00	8.12-37	1.35-36	3.01-36	6.81-36	1.48-35	3.10-35	6.37-35	1.30-34	2.58-34	3.56-34	-4.99-33		
13	0.00+00	1.04-36	1.79-36	4.16-36	9.84-36	2.23-35	4.89-35	1.04-34	2.12-34	2.68-34	-5.14-33			
12	0.00+00	1.36-36	2.43-36	5.96-36	1.49-35	3.62-35	8.52-35	1.94-34	3.37-34	-3.58-33				
11	0.00+00	1.83-36	3.43-36	8.99-36	2.44-35	6.51-35	1.72-34	4.18-34	-1.49-33					
10	0.00+00	2.57-36	5.11-36	1.46-35	4.44-35	1.38-34	4.40-34	4.01-34						
9	0.00+00	3.78-36	8.15-36	2.64-35	9.61-35	3.89-34	1.65-33							
8	0.00+00	5.95-36	1.44-35	5.72-35	2.86-34	2.09-33								
7	0.00+00	1.03-35	3.03-35	1.72-34	1.81-33									
6	0.00+00	2.09-35	8.71-35	1.15-33										
5	0.00+00	5.59-35	5.49-34											
4	0.00+00	2.97-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-4.17-35	-5.82-35	-8.10-35	-1.13-34	-1.58-34	-2.20-34	-3.07-34	-4.28-34	-5.96-34	-8.28-34	-1.15-33	-1.58-33	-2.18-33	-2.99-33
45	-3.59-35	-4.98-35	-6.96-35	-9.85-35	-1.41-34	-2.03-34	-2.96-34	-4.32-34	-6.31-34	-9.22-34	-1.35-33	-1.96-33	-2.86-33	-4.17-33
40	-1.50-35	-1.81-35	-2.32-35	-3.26-35	-5.05-35	-8.36-35	-1.43-34	-2.47-34	-4.25-34	-7.21-34	-1.21-33	-2.01-33	-3.34-33	-5.56-33
35	3.20-35	5.71-35	9.40-35	1.46-34	2.17-34	3.09-34	4.26-34	5.99-34	7.00-34	8.15-34	8.26-34	5.35-34	-5.36-34	-3.65-33
30	1.46-34	2.56-34	4.33-34	7.19-34	1.18-33	1.94-33	3.22-33	5.43-33	9.49-33	1.76-32	3.58-32	8.57-32	2.78-31	1.94-30
29	1.91-34	3.34-34	5.75-34	9.75-34	1.65-33	2.82-33	4.90-33	8.83-33	1.69-32	3.55-32	8.79-32	2.98-31	2.19-30	
28	2.46-34	4.37-34	7.66-34	1.34-33	2.35-33	4.20-33	7.77-33	1.52-32	3.29-32	8.36-32	2.91-31	2.21-30		
27	3.18-34	5.75-34	1.03-33	1.86-33	3.42-33	6.49-33	1.30-32	2.88-32	7.50-32	2.67-31	2.07-30			
26	4.12-34	7.63-34	1.41-33	2.66-33	5.17-33	1.06-32	2.40-32	6.38-32	2.31-31	1.82-30				
25	5.39-34	1.03-33	1.98-33	3.94-33	8.28-33	1.91-32	5.16-32	1.90-31	1.52-30					
24	7.11-34	1.41-33	2.86-33	6.14-33	1.44-32	3.97-32	1.48-31	1.20-30						
23	9.54-34	1.98-33	4.34-33	1.04-32	2.89-32	1.10-31	8.90-31							
22	1.31-33	2.92-33	7.09-33	2.00-32	7.64-32	6.22-31								
21	1.88-33	4.61-33	1.32-32	5.04-32	4.08-31									
20	2.85-33	8.19-33	3.14-32	2.51-31										
19	4.81-33	1.82-32	1.42-31											
18	9.83-33	7.25-32												
17	3.16-32													

HE + TE = 1.50+04 NE = 1.00+07 CASE B NC = 56

TOTAL RC = 1.156-12 4-3 RC = 2.189-13 4-3 EM = 9.278-25 2S RC = 3.355-13 2P RC = 8.202-13

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.42-03	1.35-03	5.82-04	3.02-04	1.76-04	1.12-04	7.51-05	5.29-05	3.87-05	2.91-05	2.25-05	1.77-05	1.42-05	1.16-05
45	5.79-03	1.78-03	7.64-04	3.96-04	2.31-04	1.46-04	9.85-05	6.94-05	5.08-05	3.82-05	2.95-05	2.32-05	1.86-05	1.52-05
40	7.63-03	2.34-03	1.01-03	5.22-04	3.05-04	1.93-04	1.30-04	9.16-05	6.69-05	5.04-05	3.89-05	3.07-05	2.46-05	2.00-05
35	1.00-02	3.07-03	1.32-03	6.86-04	4.00-04	2.54-04	1.71-04	1.21-04	8.81-05	6.64-05	5.13-05	4.04-05	3.24-05	2.63-05
30	1.33-02	4.11-03	1.77-03	9.19-04	5.38-04	3.41-04	2.30-04	1.62-04	1.19-04	8.96-05	6.92-05	5.46-05	4.38-05	3.56-05
29	1.42-02	4.39-03	1.89-03	9.84-04	5.76-04	3.66-04	2.47-04	1.74-04	1.28-04	9.62-05	7.43-05	5.86-05	4.70-05	3.82-05
28	1.53-02	4.71-03	2.03-03	1.06-03	6.20-04	3.94-04	2.66-04	1.88-04	1.38-04	1.04-04	8.02-05	6.32-05	5.07-05	4.13-05
27	1.65-02	5.08-03	2.20-03	1.14-03	6.71-04	4.27-04	2.88-04	2.04-04	1.49-04	1.13-04	8.71-05	6.87-05	5.51-05	4.49-05
26	1.78-02	5.51-03	2.39-03	1.25-03	7.31-04	4.65-04	3.15-04	2.23-04	1.63-04	1.23-04	9.53-05	7.52-05	6.04-05	4.92-05
25	1.94-02	6.01-03	2.61-03	1.36-03	8.01-04	5.11-04	3.46-04	2.45-04	1.80-04	1.36-04	1.05-04	8.29-05	6.66-05	5.42-05
24	2.11-02	6.57-03	2.86-03	1.50-03	8.83-04	5.64-04	3.82-04	2.71-04	1.99-04	1.51-04	1.17-04	9.21-05	7.40-05	6.03-05
23	2.31-02	7.22-03	3.15-03	1.66-03	9.79-04	6.27-04	4.26-04	3.02-04	2.22-04	1.68-04	1.31-04	1.03-04	8.30-05	6.76-05
22	2.54-02	7.95-03	3.49-03	1.84-03	1.09-03	7.01-04	4.77-04	3.40-04	2.51-04	1.90-04	1.47-04	1.17-04	9.38-05	7.65-05
21	2.78-02	8.78-03	3.88-03	2.06-03	1.23-03	7.90-04	5.40-04	3.85-04	2.85-04	2.16-04	1.68-04	1.33-04	1.07-04	8.74-05
20	3.06-02	9.73-03	4.33-03	2.32-03	1.39-03	8.98-04	6.16-04	4.41-04	3.27-04	2.49-04	1.94-04	1.54-04	1.24-04	1.01-04
19	3.36-02	1.08-02	4.87-03	2.62-03	1.58-03	1.03-03	7.11-04	5.11-04	3.80-04	2.90-04	2.26-04	1.79-04	1.44-04	1.17-04
18	3.70-02	1.21-02	5.50-03	3.00-03	1.83-03	1.20-03	8.30-04	5.99-04	4.47-04	3.42-04	2.67-04	2.12-04	1.70-04	1.38-04
17	4.09-02	1.36-02	6.28-03	3.47-03	2.13-03	1.41-03	9.83-04	7.13-04	5.33-04	4.09-04	3.20-04	2.53-04	2.02-04	1.61-04
16	4.53-02	1.54-02	7.25-03	4.06-03	2.53-03	1.68-03	1.18-03	8.61-04	6.46-04	4.96-04	3.87-04	3.05-04	2.40-04	1.80-04
15	5.08-02	1.76-02	8.50-03	4.84-03	3.04-03	2.05-03	1.45-03	1.06-03	7.95-04	6.10-04	4.73-04	3.67-04	2.72-04	
14	5.80-02	2.05-02	1.01-02	5.87-03	3.74-03	2.54-03	1.80-03	1.32-03	9.91-04	7.56-04	5.77-04	4.21-04		
13	6.78-02	2.45-02	1.24-02	7.28-03	4.69-03	3.20-03	2.28-03	1.67-03	1.25-03	9.37-04	6.73-04			
12	8.15-02	3.00-02	1.55-02	9.24-03	6.01-03	4.13-03	2.94-03	2.15-03	1.58-03	1.11-03				
11	1.01-01	3.79-02	1.99-02	1.21-02	7.90-03	5.44-03	3.87-03	2.78-03	1.92-03					
10	1.31-01	4.97-02	2.65-02	1.62-02	1.07-02	7.35-03	5.15-03	3.48-03						
9	1.77-01	6.80-02	3.67-02	2.26-02	1.49-02	1.02-02	6.71-03							
8	2.51-01	9.76-02	5.32-02	3.31-02	2.17-02	1.39-02								
7	3.78-01	1.49-01	8.21-02	5.10-02	3.18-02									
6	6.15-01	2.46-01	1.37-01	8.22-02										
5	1.12+00	4.56-01	2.51-01											
4	2.45+00	1.00+00												
3	7.42+00													

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	9.53-06	7.95-06	6.70-06	5.70-06	4.89-06	4.23-06	3.68-06	3.22-06	2.83-06	2.51-06	2.23-06	1.99-06	1.78-06	1.60-06
45	1.25-05	1.04-05	8.80-06	7.48-06	6.42-06	5.54-06	4.82-06	4.22-06	3.71-06	3.28-06	2.92-06	2.60-06	2.33-06	2.10-06
40	1.65-05	1.38-05	1.16-05	9.86-06	8.46-06	7.30-06	6.35-06	5.56-06	4.89-06	4.32-06	3.84-06	3.42-06	3.06-06	2.75-06
35	2.17-05	1.81-05	1.53-05	1.30-05	1.11-05	9.61-06	8.35-06	7.30-06	6.42-06	5.66-06	5.02-06	4.47-06	3.99-06	3.57-06
30	2.94-05	2.45-05	2.06-05	1.75-05	1.50-05	1.30-05	1.12-05	9.80-06	8.58-06	7.53-06	6.62-06	5.80-06	5.02-06	4.10-06
29	3.15-05	2.63-05	2.22-05	1.88-05	1.61-05	1.39-05	1.20-05	1.05-05	9.16-06	8.01-06	6.99-06	6.03-06	4.91-06	
28	3.41-05	2.84-05	2.39-05	2.03-05	1.74-05	1.50-05	1.30-05	1.13-05	9.81-06	8.52-06	7.31-06	5.93-06		
27	3.70-05	3.09-05	2.60-05	2.21-05	1.89-05	1.62-05	1.40-05	1.21-05	1.05-05	8.97-06	7.25-06			
26	4.06-05	3.38-05	2.85-05	2.41-05	2.06-05	1.77-05	1.52-05	1.31-05	1.11-05	8.97-06				
25	4.47-05	3.73-05	3.14-05	2.66-05	2.27-05	1.94-05	1.66-05	1.40-05	1.12-05					
24	4.98-05	4.15-05	3.49-05	2.95-05	2.51-05	2.13-05	1.79-05	1.43-05						
23	5.58-05	4.65-05	3.90-05	3.29-05	2.78-05	2.32-05	1.84-05							
22	6.31-05	5.25-05	4.39-05	3.68-05	3.06-05	2.41-05								
21	7.20-05	5.97-05	4.97-05	4.10-05	3.21-05									
20	8.28-05	6.83-05	5.60-05	4.35-05										
19	9.59-05	7.79-05	6.02-05											
18	1.11-04	8.49-05												
17	1.22-04													

HE + TE = 1.50+04 NE = 1.00+07 CASE B NC = 56

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-7.12-39	-7.63-38	-2.54-37	-6.36-37	-1.35-36	-2.59-36	-4.61-36	-7.76-36	-1.25-35	-1.96-35	-2.99-35	-4.49-35	-6.63-35
45	0.00+00	-7.88-39	-9.69-38	-3.26-37	-8.17-37	-1.74-36	-3.34-36	-5.95-36	-1.00-35	-1.63-35	-2.57-35	-3.96-35	-6.00-35	-8.96-35
40	0.00+00	-6.73-39	-1.19-37	-4.07-37	-1.02-36	-2.18-36	-4.18-36	-7.45-36	-1.26-35	-2.05-35	-3.26-35	-5.08-35	-7.80-35	-1.19-34
35	0.00+00	9.98-41	-1.35-37	-4.77-37	-1.20-36	-2.54-36	-4.83-36	-8.55-36	-1.44-35	-2.34-35	-3.73-35	-5.88-35	-9.21-35	-1.44-34
30	0.00+00	1.91-38	-1.35-37	-5.12-37	-1.28-36	-2.66-36	-4.90-36	-8.37-36	-1.36-35	-2.14-35	-3.34-35	-5.25-35	-8.37-35	-1.36-34
29	0.00+00	2.51-38	-1.33-37	-5.16-37	-1.29-36	-2.66-36	-4.85-36	-8.17-36	-1.30-35	-2.02-35	-3.11-35	-4.83-35	-7.69-35	-1.26-34
28	0.00+00	3.21-38	-1.30-37	-5.21-37	-1.30-36	-2.66-36	-4.79-36	-7.92-36	-1.24-35	-1.87-35	-2.80-35	-4.28-35	-6.77-35	-1.12-34
27	0.00+00	4.02-38	-1.27-37	-5.26-37	-1.32-36	-2.66-36	-4.72-36	-7.63-36	-1.16-35	-1.68-35	-2.42-35	-3.56-35	-5.51-35	-9.20-35
26	0.00+00	4.98-38	-1.23-37	-5.32-37	-1.33-36	-2.67-36	-4.64-36	-7.28-36	-1.06-35	-1.45-35	-1.92-35	-2.60-35	-3.80-35	-6.30-35
25	0.00+00	6.13-38	-1.18-37	-5.36-37	-1.34-36	-2.66-36	-4.52-36	-6.83-36	-9.28-36	-1.14-35	-1.27-35	-1.30-35	-1.36-35	-1.99-35
24	0.00+00	7.53-38	-1.09-37	-5.36-37	-1.35-36	-2.63-36	-4.34-36	-6.21-36	-7.58-36	-7.32-36	-3.70-36	5.40-36	2.23-35	4.72-35
23	0.00+00	9.27-38	-9.63-38	-5.27-37	-1.34-36	-2.56-36	-4.06-36	-5.32-36	-5.19-36	-1.59-36	9.08-36	3.24-35	7.71-35	1.56-34
22	0.00+00	1.15-37	-7.62-38	-5.05-37	-1.29-36	-2.43-36	-3.62-36	-4.02-36	-1.79-36	6.62-36	2.78-35	7.32-35	1.64-34	3.40-34
21	0.00+00	1.43-37	-4.55-38	-4.61-37	-1.20-36	-2.18-36	-2.91-36	-2.09-36	3.13-36	1.86-35	5.56-35	1.37-34	3.08-34	6.71-34
20	0.00+00	1.79-37	1.67-40	-3.83-37	-1.04-36	-1.77-36	-1.83-36	7.29-37	1.03-35	3.62-35	9.82-35	2.39-34	5.58-34	1.31-33
19	0.00+00	2.27-37	6.73-38	-2.57-37	-7.64-37	-1.12-36	-2.10-37	4.84-36	2.07-35	6.25-35	1.65-34	4.11-34	1.02-33	2.67-33
18	0.00+00	2.89-37	1.64-37	-6.41-38	-3.42-37	-1.43-37	2.16-36	1.08-35	3.60-35	1.03-34	2.73-34	7.17-34	1.97-33	6.11-33
17	0.00+00	3.70-37	2.99-37	2.21-37	2.90-37	1.30-36	5.60-36	1.94-35	5.88-35	1.66-34	4.59-34	1.32-33	4.26-33	1.81-32
16	0.00+00	4.77-37	4.87-37	6.32-37	1.21-36	3.38-36	1.05-35	3.20-35	9.33-35	2.69-34	8.05-34	2.69-33	1.17-32	1.05-31
15	0.00+00	6.17-37	7.44-37	1.21-36	2.53-36	6.40-36	1.78-35	5.08-35	1.48-34	4.54-34	1.55-33	6.04-33	6.08-32	
14	0.00+00	8.02-37	1.09-36	2.03-36	4.44-36	1.09-35	2.87-35	8.08-35	2.44-34	8.33-34	3.65-33	3.12-32		
13	0.00+00	1.05-36	1.57-36	3.20-36	7.31-36	1.79-35	4.67-35	1.33-34	4.35-34	1.81-33	1.40-32			
12	0.00+00	1.39-36	2.25-36	4.97-36	1.19-35	2.98-35	7.96-35	2.39-34	8.93-34	5.39-33				
11	0.00+00	1.88-36	3.27-36	7.80-36	2.00-35	5.33-35	1.52-34	5.06-34	1.98-33					
10	0.00+00	2.62-36	4.90-36	1.29-35	3.66-35	1.09-34	3.62-34	1.11-33						
9	0.00+00	3.85-36	7.82-36	2.33-35	7.81-35	2.94-34	1.23-33							
8	0.00+00	6.03-36	1.38-35	4.99-35	2.26-34	1.44-33								
7	0.00+00	1.04-35	2.87-35	1.47-34	1.35-33									
6	0.00+00	2.10-35	8.12-35	9.45-34										
5	0.00+00	5.61-35	4.97-34											
4	0.00+00	2.95-34												
3	0.00+00													

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-9.64-35	-1.39-34	-1.96-34	-2.75-34	-3.82-34	-5.24-34	-7.13-34	-9.61-34	-1.29-33	-1.71-33	-2.26-33	-2.97-33	-3.88-33	-5.03-33
45	-1.32-34	-1.93-34	-2.79-34	-3.98-34	-5.64-34	-7.92-34	-1.10-33	-1.53-33	-2.11-33	-2.90-33	-3.96-33	-5.41-33	-7.36-33	-1.00-32
40	-1.79-34	-2.68-34	-3.97-34	-5.85-34	-8.55-34	-1.24-33	-1.80-33	-2.61-33	-3.77-33	-5.46-33	-7.93-33	-1.16-32	-1.69-32	-2.50-32
35	-2.24-34	-3.49-34	-5.43-34	-8.41-34	-1.30-33	-2.02-33	-3.13-33	-4.90-33	-7.74-33	-1.24-32	-2.03-32	-3.40-32	-5.91-32	-1.08-31
30	-2.26-34	-3.80-34	-6.47-34	-1.11-33	-1.94-33	-3.43-33	-6.20-33	-1.16-32	-2.29-32	-4.84-32	-1.14-31	-3.21-31	-1.25-30	-1.07-29
29	-2.14-34	-3.69-34	-6.50-34	-1.16-33	-2.10-33	-3.89-33	-7.44-33	-1.49-32	-3.21-32	-7.71-32	-2.21-31	-8.75-31	-7.64-30	
28	-1.94-34	-3.48-34	-6.39-34	-1.20-33	-2.28-33	-4.49-33	-9.23-33	-2.03-32	-4.97-32	-1.45-31	-5.86-31	-5.23-30		
27	-1.65-34	-3.11-34	-6.06-34	-1.21-33	-2.48-33	-5.30-33	-1.20-32	-3.02-32	-9.03-32	-3.73-31	-3.40-30			
26	-1.19-34	-2.46-34	-5.31-34	-1.18-33	-2.68-33	-6.42-33	-1.69-32	-5.22-32	-2.22-31	-2.08-30				
25	-4.70-35	-1.33-34	-3.71-34	-1.01-33	-2.77-33	-8.00-33	-2.66-32	-1.19-31	-1.17-30					
24	7.37-35	7.69-35	-2.48-35	-5.04-34	-2.34-33	-9.89-33	-5.15-32	-5.57-31						
23	2.85-34	4.86-34	7.68-34	1.03-33	4.42-34	-8.30-33	-1.60-31							
22	6.78-34	1.35-33	2.77-33	6.23-33	1.72-32	8.16-32								
21	1.46-33	3.36-33	8.76-33	2.99-32	2.12-31									
20	3.22-33	9.01-33	3.35-32	2.63-31										
19	7.89-33	3.09-32	2.56-31											
18	2.50-32	2.14-31												
17	1.59-31													

HE + TE = 1.50+04 NE = 1.00+08 CASE B NC = 36

TOTAL RC = 1.183-12 4-3 RC = 2.119-13 4-3 EM = 8.980-25 2S RC = 3.487-13 2P RC = 8.340-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.84-03	1.48-03	6.38-04	3.30-04	1.93-04	1.22-04	8.22-05	5.79-05	4.23-05	3.19-05	2.46-05	1.94-05	1.55-05	1.26-05
45	6.59-03	2.02-03	8.69-04	4.50-04	2.62-04	1.66-04	1.12-04	7.88-05	5.76-05	4.34-05	3.35-05	2.64-05	2.11-05	1.72-05
40	9.23-03	2.83-03	1.22-03	6.30-04	3.68-04	2.33-04	1.57-04	1.10-04	8.06-05	6.07-05	4.68-05	3.69-05	2.96-05	2.41-05
35	1.32-02	4.05-03	1.74-03	9.02-04	5.26-04	3.33-04	2.24-04	1.58-04	1.15-04	8.68-05	6.70-05	5.28-05	4.23-05	3.44-05
30	1.91-02	5.87-03	2.52-03	1.31-03	7.62-04	4.82-04	3.25-04	2.29-04	1.67-04	1.26-04	9.70-05	7.63-05	6.12-05	4.97-05
29	2.06-02	6.31-03	2.71-03	1.40-03	8.20-04	5.19-04	3.49-04	2.46-04	1.80-04	1.35-04	1.04-04	8.21-05	6.58-05	5.35-05
28	2.21-02	6.78-03	2.91-03	1.51-03	8.81-04	5.58-04	3.75-04	2.64-04	1.93-04	1.45-04	1.12-04	8.83-05	7.07-05	5.75-05
27	2.37-02	7.28-03	3.13-03	1.62-03	9.46-04	5.99-04	4.03-04	2.84-04	2.08-04	1.56-04	1.20-04	9.48-05	7.59-05	6.17-05
26	2.54-02	7.81-03	3.36-03	1.74-03	1.02-03	6.43-04	4.33-04	3.05-04	2.23-04	1.68-04	1.29-04	1.02-04	8.15-05	6.62-05
25	2.73-02	8.38-03	3.60-03	1.87-03	1.09-03	6.91-04	4.65-04	3.28-04	2.39-04	1.80-04	1.39-04	1.09-04	8.75-05	7.11-05
24	2.93-02	9.00-03	3.87-03	2.01-03	1.17-03	7.43-04	5.00-04	3.52-04	2.58-04	1.94-04	1.49-04	1.18-04	9.41-05	7.64-05
23	3.15-02	9.70-03	4.18-03	2.17-03	1.26-03	8.02-04	5.40-04	3.80-04	2.78-04	2.09-04	1.61-04	1.27-04	1.02-04	8.24-05
22	3.41-02	1.05-02	4.52-03	2.35-03	1.37-03	8.70-04	5.86-04	4.13-04	3.02-04	2.27-04	1.75-04	1.38-04	1.10-04	8.94-05
21	3.72-02	1.15-02	4.94-03	2.57-03	1.50-03	9.52-04	6.42-04	4.52-04	3.31-04	2.49-04	1.92-04	1.51-04	1.21-04	9.77-05
20	4.09-02	1.26-02	5.45-03	2.83-03	1.66-03	1.05-03	7.10-04	5.01-04	3.66-04	2.76-04	2.12-04	1.67-04	1.33-04	1.08-04
19	4.54-02	1.40-02	6.06-03	3.16-03	1.85-03	1.18-03	7.94-04	5.61-04	4.10-04	3.09-04	2.38-04	1.87-04	1.49-04	1.20-04
18	5.08-02	1.57-02	6.82-03	3.56-03	2.09-03	1.33-03	9.01-04	6.37-04	4.66-04	3.51-04	2.70-04	2.12-04	1.69-04	1.35-04
17	5.73-02	1.78-02	7.76-03	4.06-03	2.39-03	1.53-03	1.03-03	7.32-04	5.37-04	4.04-04	3.11-04	2.44-04	1.93-04	1.52-04
16	6.50-02	2.03-02	8.90-03	4.69-03	2.77-03	1.78-03	1.21-03	8.56-04	6.28-04	4.73-04	3.64-04	2.83-04	2.21-04	1.64-04
15	7.41-02	2.34-02	1.03-02	5.48-03	3.26-03	2.10-03	1.43-03	1.02-03	7.48-04	5.63-04	4.31-04	3.31-04	2.43-04	
14	8.49-02	2.71-02	1.21-02	6.49-03	3.90-03	2.52-03	1.73-03	1.23-03	9.08-04	6.82-04	5.15-04	3.74-04		
13	9.78-02	3.17-02	1.44-02	7.84-03	4.75-03	3.11-03	2.14-03	1.53-03	1.12-03	8.35-04	5.97-04			
12	1.14-01	3.77-02	1.75-02	9.69-03	5.96-03	3.93-03	2.72-03	1.95-03	1.41-03	9.93-04				
11	1.34-01	4.59-02	2.19-02	1.24-02	7.70-03	5.12-03	3.56-03	2.52-03	1.73-03					
10	1.64-01	5.77-02	2.84-02	1.63-02	1.03-02	6.90-03	4.74-03	3.18-03						
9	2.09-01	7.57-02	3.84-02	2.26-02	1.44-02	9.53-03	6.20-03							
8	2.84-01	1.05-01	5.48-02	3.27-02	2.07-02	1.30-02								
7	4.15-01	1.57-01	8.34-02	4.99-02	3.01-02									
6	6.64-01	2.56-01	1.37-01	7.88-02										
5	1.20+00	4.69-01	2.45-01											
4	2.60+00	1.00+00												
3	7.70+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.04-05	8.70-06	7.33-06	6.24-06	5.35-06	4.62-06	4.02-06	3.52-06	3.10-06	2.74-06	2.44-06	2.17-06	1.95-06	1.75-06
45	1.42-05	1.18-05	9.97-06	8.48-06	7.27-06	6.28-06	5.46-06	4.78-06	4.21-06	3.72-06	3.30-06	2.95-06	2.64-06	2.37-06
40	1.98-05	1.65-05	1.39-05	1.18-05	1.02-05	8.77-06	7.62-06	6.67-06	5.86-06	5.18-06	4.60-06	4.10-06	3.67-06	3.30-06
35	2.83-05	2.36-05	1.99-05	1.69-05	1.45-05	1.25-05	1.09-05	9.49-06	8.33-06	7.36-06	6.52-06	5.80-06	5.17-06	4.62-06
30	4.10-05	3.41-05	2.87-05	2.44-05	2.09-05	1.80-05	1.56-05	1.36-05	1.19-05	1.04-05	9.14-06	8.00-06	6.91-06	5.64-06
29	4.40-05	3.67-05	3.09-05	2.62-05	2.24-05	1.93-05	1.67-05	1.45-05	1.27-05	1.11-05	9.65-06	8.30-06	6.75-06	
28	4.73-05	3.94-05	3.31-05	2.81-05	2.40-05	2.07-05	1.79-05	1.55-05	1.35-05	1.17-05	1.00-05	8.11-06		
27	5.08-05	4.23-05	3.55-05	3.01-05	2.57-05	2.21-05	1.91-05	1.65-05	1.42-05	1.21-05	9.78-06			
26	5.45-05	4.53-05	3.81-05	3.22-05	2.75-05	2.36-05	2.02-05	1.74-05	1.47-05	1.18-05				
25	5.85-05	4.86-05	4.08-05	3.45-05	2.93-05	2.51-05	2.14-05	1.80-05	1.44-05					
24	6.28-05	5.22-05	4.37-05	3.69-05	3.13-05	2.65-05	2.23-05	1.77-05						
23	6.77-05	5.62-05	4.70-05	3.95-05	3.32-05	2.77-05	2.19-05							
22	7.33-05	6.07-05	5.06-05	4.23-05	3.50-05	2.75-05								
21	8.00-05	6.60-05	5.46-05	4.49-05	3.50-05									
20	8.80-05	7.21-05	5.87-05	4.54-05										
19	9.75-05	7.86-05	6.03-05											
18	1.08-04	8.20-05												
17	1.14-04													

HE + TE = 1.50+04 NE = 1.00+08 CASE B NC = 36

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-8.38-39	-8.44-38	-2.84-37	-7.18-37	-1.55-36	-3.02-36	-5.47-36	-9.37-36	-1.54-35	-2.44-35	-3.76-35	-5.64-35	-8.25-35
45	0.00+00	-1.12-38	-1.15-37	-3.88-37	-9.86-37	-2.14-36	-4.19-36	-7.63-36	-1.32-35	-2.18-35	-3.50-35	-5.44-35	-8.26-35	-1.22-34
40	0.00+00	-1.50-38	-1.60-37	-5.44-37	-1.39-36	-3.04-36	-5.99-36	-1.10-35	-1.92-35	-3.22-35	-5.22-35	-8.25-35	-1.27-34	-1.92-34
35	0.00+00	-1.84-38	-2.24-37	-7.71-37	-1.98-36	-4.37-36	-8.69-36	-1.62-35	-2.86-35	-4.88-35	-8.09-35	-1.31-34	-2.07-34	-3.22-34
30	0.00+00	-1.63-38	-3.04-37	-1.07-36	-2.79-36	-6.20-36	-1.25-35	-2.36-35	-4.27-35	-7.48-35	-1.28-34	-2.15-34	-3.56-34	-5.82-34
29	0.00+00	-1.38-38	-3.19-37	-1.13-36	-2.95-36	-6.58-36	-1.33-35	-2.52-35	-4.59-35	-8.10-35	-1.40-34	-2.37-34	-3.98-34	-6.60-34
28	0.00+00	-9.91-39	-3.32-37	-1.19-36	-3.12-36	-6.96-36	-1.41-35	-2.68-35	-4.91-35	-8.73-35	-1.52-34	-2.62-34	-4.45-34	-7.50-34
27	0.00+00	-4.40-39	-3.43-37	-1.24-36	-3.26-36	-7.30-36	-1.48-35	-2.84-35	-5.22-35	-9.36-35	-1.65-34	-2.88-34	-4.97-34	-8.54-34
26	0.00+00	3.19-39	-3.50-37	-1.29-36	-3.39-36	-7.61-36	-1.55-35	-2.97-35	-5.50-35	-9.96-35	-1.78-34	-3.15-34	-5.54-34	-9.75-34
25	0.00+00	1.33-38	-3.53-37	-1.32-36	-3.50-36	-7.86-36	-1.60-35	-3.09-35	-5.75-35	-1.05-34	-1.91-34	-3.43-34	-6.18-34	-1.12-33
24	0.00+00	2.64-38	-3.51-37	-1.35-36	-3.58-36	-8.04-36	-1.64-35	-3.17-35	-5.95-35	-1.10-34	-2.03-34	-3.73-34	-6.89-34	-1.29-33
23	0.00+00	4.29-38	-3.45-37	-1.36-36	-3.64-36	-8.17-36	-1.67-35	-3.23-35	-6.09-35	-1.14-34	-2.14-34	-4.04-34	-7.71-34	-1.50-33
22	0.00+00	6.34-38	-3.35-37	-1.37-36	-3.68-36	-8.25-36	-1.68-35	-3.25-35	-6.18-35	-1.17-34	-2.25-34	-4.38-34	-8.69-34	-1.77-33
21	0.00+00	8.86-38	-3.20-37	-1.38-36	-3.72-36	-8.31-36	-1.69-35	-3.26-35	-6.22-35	-1.20-34	-2.36-34	-4.77-34	-9.94-34	-2.16-33
20	0.00+00	1.20-37	-3.02-37	-1.39-36	-3.76-36	-8.37-36	-1.69-35	-3.24-35	-6.21-35	-1.21-34	-2.47-34	-5.23-34	-1.16-33	-2.77-33
19	0.00+00	1.58-37	-2.77-37	-1.39-36	-3.80-36	-8.42-36	-1.68-35	-3.20-35	-6.10-35	-1.21-34	-2.56-34	-5.78-34	-1.41-33	-3.83-33
18	0.00+00	2.08-37	-2.43-37	-1.38-36	-3.83-36	-8.42-36	-1.65-35	-3.07-35	-5.78-35	-1.16-34	-2.57-34	-6.34-34	-1.78-33	-5.93-33
17	0.00+00	2.73-37	-1.89-37	-1.35-36	-3.80-36	-8.25-36	-1.56-35	-2.77-35	-4.96-35	-9.78-35	-2.28-34	-6.49-34	-2.29-33	-1.12-32
16	0.00+00	3.60-37	-1.01-37	-1.25-36	-3.62-36	-7.68-36	-1.35-35	-2.09-35	-2.96-35	-4.47-35	-9.91-35	-3.95-34	-2.50-33	-3.34-32
15	0.00+00	4.82-37	4.32-38	-1.03-36	-3.16-36	-6.30-36	-8.94-36	-5.86-36	1.83-35	1.07-34	4.09-34	1.61-33	1.04-32	
14	0.00+00	6.55-37	2.83-37	-5.85-37	-2.13-36	-3.35-36	7.02-37	2.74-35	1.38-34	5.85-34	2.84-33	2.65-32		
13	0.00+00	9.05-37	6.78-37	2.39-37	-1.01-37	2.59-36	2.09-35	1.04-34	4.76-34	2.54-33	2.61-32			
12	0.00+00	1.27-36	1.32-36	1.72-36	3.77-36	1.45-35	6.47-35	3.03-34	1.71-33	1.86-32				
11	0.00+00	1.82-36	2.37-36	4.34-36	1.12-35	3.93-35	1.72-34	9.66-34	1.06-32					
10	0.00+00	2.65-36	4.09-36	9.11-36	2.62-35	9.77-35	5.05-34	5.07-33						
9	0.00+00	3.98-36	7.08-36	1.86-35	6.22-35	2.81-34	2.40-33							
8	0.00+00	6.26-36	1.29-35	4.17-35	1.81-34	1.37-33								
7	0.00+00	1.08-35	2.69-35	1.21-34	1.02-33									
6	0.00+00	2.15-35	7.47-35	7.40-34										
5	0.00+00	5.69-35	4.38-34											
4	0.00+00	2.95-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.18-34	-1.66-34	-2.28-34	-3.09-34	-4.10-34	-5.34-34	-6.83-34	-8.58-34	-1.06-33	-1.29-33	-1.55-33	-1.84-33	-2.17-33	-2.55-33
45	-1.78-34	-2.53-34	-3.54-34	-4.88-34	-6.62-34	-8.82-34	-1.16-33	-1.49-33	-1.89-33	-2.37-33	-2.95-33	-3.64-33	-4.48-33	-5.52-33
40	-2.85-34	-4.16-34	-5.97-34	-8.46-34	-1.18-33	-1.63-33	-2.22-33	-2.98-33	-3.97-33	-5.24-33	-6.89-33	-9.07-33	-1.20-32	-1.61-32
35	-4.94-34	-7.47-34	-1.12-33	-1.66-33	-2.44-33	-3.57-33	-5.18-33	-7.49-33	-1.08-32	-1.58-32	-2.32-32	-3.50-32	-5.45-32	-8.93-32
30	-9.44-34	-1.53-33	-2.46-33	-3.98-33	-6.48-33	-1.06-32	-1.77-32	-3.03-32	-5.40-32	-1.02-31	-2.14-31	-5.34-31	-1.83-30	-1.39-29
29	-1.09-33	-1.79-33	-2.96-33	-4.92-33	-8.26-33	-1.41-32	-2.47-32	-4.51-32	-8.73-32	-1.87-31	-4.72-31	-1.65-30	-1.26-29	
28	-1.26-33	-2.12-33	-3.60-33	-6.19-33	-1.08-32	-1.94-32	-3.63-32	-7.19-32	-1.57-31	-4.06-31	-1.44-30	-1.12-29		
27	-1.47-33	-2.54-33	-4.45-33	-7.96-33	-1.46-32	-2.80-32	-5.69-32	-1.28-31	-3.37-31	-1.22-30	-9.70-30			
26	-1.72-33	-3.08-33	-5.61-33	-1.05-32	-2.07-32	-4.31-32	-9.92-32	-2.69-31	-9.99-31	-8.10-30				
25	-2.04-33	-3.79-33	-7.26-33	-1.45-32	-3.11-32	-7.34-32	-2.04-31	-7.80-31	-6.48-30					
24	-2.44-33	-4.77-33	-9.76-33	-2.13-32	-5.16-32	-1.47-31	-5.78-31	-4.94-30						
23	-2.99-33	-6.23-33	-1.39-32	-3.43-32	-1.01-31	-4.05-31	-3.56-30							
22	-3.77-33	-8.58-33	-2.17-32	-6.49-32	-2.68-31	-2.42-30								
21	-5.03-33	-1.29-32	-3.96-32	-1.67-31	-1.55-30									
20	-7.31-33	-2.28-32	-9.83-32	-9.33-31										
19	-1.23-32	-5.43-32	-5.27-31											
18	-2.72-32	-2.73-31												
17	-1.20-31													

HE + TE = 1.50+04 NE = 1.00+09 CASE B NC = 23

TOTAL RC = 1.234-12 4-3 RC = 2.048-13 4-3 EM = 8.680-25 2S RC = 3.713-13 2P RC = 8.624-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.07-03	1.55-03	6.68-04	3.46-04	2.02-04	1.28-04	8.60-05	6.06-05	4.43-05	3.34-05	2.58-05	2.03-05	1.63-05	1.32-05
45	6.96-03	2.14-03	9.18-04	4.75-04	2.77-04	1.76-04	1.18-04	8.33-05	6.09-05	4.58-05	3.54-05	2.79-05	2.23-05	1.82-05
40	9.92-03	3.04-03	1.31-03	6.77-04	3.95-04	2.50-04	1.68-04	1.19-04	8.67-05	6.52-05	5.03-05	3.96-05	3.18-05	2.58-05
35	1.48-02	4.53-03	1.95-03	1.01-03	5.88-04	3.72-04	2.50-04	1.76-04	1.29-04	9.70-05	7.48-05	5.89-05	4.72-05	3.84-05
30	2.31-02	7.09-03	3.05-03	1.58-03	9.20-04	5.82-04	3.92-04	2.76-04	2.01-04	1.52-04	1.17-04	9.20-05	7.36-05	5.99-05
29	2.55-02	7.81-03	3.35-03	1.74-03	1.01-03	6.41-04	4.31-04	3.03-04	2.22-04	1.67-04	1.29-04	1.01-04	8.10-05	6.58-05
28	2.81-02	8.61-03	3.70-03	1.91-03	1.12-03	7.06-04	4.75-04	3.34-04	2.44-04	1.84-04	1.42-04	1.11-04	8.91-05	7.24-05
27	3.10-02	9.51-03	4.08-03	2.11-03	1.23-03	7.80-04	5.24-04	3.69-04	2.70-04	2.03-04	1.56-04	1.23-04	9.83-05	7.99-05
26	3.43-02	1.05-02	4.51-03	2.34-03	1.36-03	8.62-04	5.79-04	4.08-04	2.98-04	2.24-04	1.73-04	1.36-04	1.09-04	8.81-05
25	3.79-02	1.16-02	5.00-03	2.59-03	1.51-03	9.54-04	6.41-04	4.51-04	3.29-04	2.48-04	1.91-04	1.50-04	1.20-04	9.73-05
24	4.20-02	1.29-02	5.53-03	2.86-03	1.67-03	1.06-03	7.09-04	4.99-04	3.64-04	2.74-04	2.11-04	1.66-04	1.32-04	1.07-04
23	4.62-02	1.42-02	6.08-03	3.15-03	1.83-03	1.16-03	7.80-04	5.49-04	4.01-04	3.01-04	2.32-04	1.82-04	1.46-04	1.18-04
22	5.09-02	1.56-02	6.71-03	3.47-03	2.02-03	1.28-03	8.61-04	6.06-04	4.42-04	3.32-04	2.56-04	2.01-04	1.60-04	1.30-04
21	5.60-02	1.72-02	7.38-03	3.82-03	2.23-03	1.41-03	9.47-04	6.66-04	4.86-04	3.65-04	2.81-04	2.20-04	1.76-04	1.42-04
20	6.15-02	1.89-02	8.10-03	4.20-03	2.45-03	1.55-03	1.04-03	7.31-04	5.33-04	4.00-04	3.08-04	2.41-04	1.92-04	1.55-04
19	6.73-02	2.06-02	8.87-03	4.59-03	2.68-03	1.69-03	1.14-03	8.00-04	5.83-04	4.38-04	3.36-04	2.63-04	2.09-04	1.68-04
18	7.35-02	2.26-02	9.70-03	5.02-03	2.93-03	1.85-03	1.24-03	8.75-04	6.37-04	4.78-04	3.67-04	2.87-04	2.27-04	1.81-04
17	8.06-02	2.47-02	1.06-02	5.51-03	3.21-03	2.03-03	1.37-03	9.60-04	6.99-04	5.23-04	4.01-04	3.12-04	2.46-04	1.93-04
16	8.90-02	2.74-02	1.18-02	6.10-03	3.56-03	2.25-03	1.51-03	1.06-03	7.73-04	5.78-04	4.41-04	3.41-04	2.64-04	1.95-04
15	9.98-02	3.07-02	1.32-02	6.86-03	4.00-03	2.53-03	1.70-03	1.20-03	8.69-04	6.47-04	4.91-04	3.74-04	2.72-04	
14	1.14-01	3.51-02	1.52-02	7.87-03	4.60-03	2.91-03	1.96-03	1.37-03	9.95-04	7.37-04	5.51-04	3.95-04		
13	1.32-01	4.10-02	1.77-02	9.24-03	5.41-03	3.43-03	2.30-03	1.61-03	1.16-03	8.50-04	5.99-04			
12	1.57-01	4.87-02	2.12-02	1.11-02	6.52-03	4.14-03	2.78-03	1.94-03	1.38-03	9.53-04				
11	1.88-01	5.90-02	2.59-02	1.37-02	8.07-03	5.15-03	3.45-03	2.38-03	1.61-03					
10	2.29-01	7.30-02	3.25-02	1.74-02	1.03-02	6.62-03	4.41-03	2.89-03						
9	2.86-01	9.29-02	4.23-02	2.30-02	1.38-02	8.83-03	5.61-03							
8	3.68-01	1.23-01	5.80-02	3.21-02	1.94-02	1.19-02								
7	5.05-01	1.75-01	8.52-02	4.80-02	2.79-02									
6	7.64-01	2.74-01	1.37-01	7.45-02										
5	1.33+00	4.86-01	2.37-01											
4	2.81+00	1.00+00												
3	8.10+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.09-05	9.11-06	7.68-06	6.53-06	5.60-06	4.84-06	4.21-06	3.68-06	3.24-06	2.87-06	2.55-06	2.28-06	2.04-06	1.83-06
45	1.50-05	1.25-05	1.05-05	8.96-06	7.68-06	6.64-06	5.77-06	5.05-06	4.44-06	3.93-06	3.49-06	3.11-06	2.79-06	2.51-06
40	2.13-05	1.78-05	1.50-05	1.27-05	1.09-05	9.42-06	8.19-06	7.16-06	6.30-06	5.57-06	4.94-06	4.41-06	3.94-06	3.54-06
35	3.16-05	2.64-05	2.22-05	1.89-05	1.62-05	1.39-05	1.21-05	1.06-05	9.30-06	8.20-06	7.27-06	6.46-06	5.77-06	5.16-06
30	4.93-05	4.10-05	3.45-05	2.93-05	2.51-05	2.16-05	1.87-05	1.63-05	1.42-05	1.25-05	1.10-05	9.58-06	8.27-06	6.75-06
29	5.42-05	4.51-05	3.79-05	3.22-05	2.75-05	2.37-05	2.05-05	1.78-05	1.55-05	1.36-05	1.18-05	1.02-05	8.25-06	
28	5.96-05	4.96-05	4.17-05	3.54-05	3.02-05	2.60-05	2.24-05	1.95-05	1.69-05	1.47-05	1.25-05	1.01-05		
27	6.57-05	5.47-05	4.59-05	3.89-05	3.32-05	2.85-05	2.46-05	2.12-05	1.83-05	1.56-05	1.25-05			
26	7.25-05	6.03-05	5.06-05	4.28-05	3.65-05	3.12-05	2.68-05	2.30-05	1.95-05	1.56-05				
25	8.00-05	6.64-05	5.57-05	4.71-05	4.00-05	3.41-05	2.91-05	2.45-05	1.95-05					
24	8.82-05	7.32-05	6.13-05	5.16-05	4.37-05	3.70-05	3.10-05	2.46-05						
23	9.69-05	8.03-05	6.71-05	5.63-05	4.73-05	3.94-05	3.11-05							
22	1.06-04	8.80-05	7.32-05	6.10-05	5.04-05	3.95-05								
21	1.16-04	9.58-05	7.92-05	6.49-05	5.05-05									
20	1.26-04	1.03-04	8.40-05	6.48-05										
19	1.36-04	1.09-04	8.37-05											
18	1.44-04	1.09-04												
17	1.44-04													

HE + TE = 1.50+04 NE = 1.00+09 CASE B NC = 23

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-7.71-39	-8.58-38	-2.93-37	-7.50-37	-1.63-36	-3.20-36	-5.80-36	-9.90-36	-1.61-35	-2.50-35	-3.73-35	-5.36-35	-7.42-35
45	0.00+00	-1.07-38	-1.19-37	-4.07-37	-1.04-36	-2.29-36	-4.51-36	-8.23-36	-1.42-35	-2.32-35	-3.64-35	-5.49-35	-7.99-35	-1.12-34
40	0.00+00	-1.54-38	-1.71-37	-5.88-37	-1.52-36	-3.35-36	-6.65-36	-1.23-35	-2.13-35	-3.53-35	-5.62-35	-8.62-35	-1.28-34	-1.83-34
35	0.00+00	-2.30-38	-2.57-37	-8.90-37	-2.32-36	-5.16-36	-1.04-35	-1.94-35	-3.43-35	-5.80-35	-9.42-35	-1.48-34	-2.25-34	-3.32-34
30	0.00+00	-3.48-38	-4.06-37	-1.42-36	-3.76-36	-8.50-36	-1.74-35	-3.33-35	-6.04-35	-1.05-34	-1.77-34	-2.89-34	-4.60-34	-7.13-34
29	0.00+00	-3.76-38	-4.48-37	-1.57-36	-4.17-36	-9.47-36	-1.95-35	-3.75-35	-6.85-35	-1.20-34	-2.04-34	-3.37-34	-5.44-34	-8.55-34
28	0.00+00	-4.05-38	-4.93-37	-1.74-36	-4.63-36	-1.06-35	-2.19-35	-4.24-35	-7.80-35	-1.38-34	-2.37-34	-3.97-34	-6.49-34	-1.04-33
27	0.00+00	-4.32-38	-5.44-37	-1.93-36	-5.16-36	-1.18-35	-2.46-35	-4.80-35	-8.92-35	-1.60-34	-2.78-34	-4.71-34	-7.83-34	-1.28-33
26	0.00+00	-4.56-38	-6.00-37	-2.14-36	-5.74-36	-1.32-35	-2.78-35	-5.46-35	-1.03-34	-1.86-34	-3.27-34	-5.65-34	-9.57-34	-1.60-33
25	0.00+00	-4.72-38	-6.60-37	-2.37-36	-6.40-36	-1.49-35	-3.14-35	-6.23-35	-1.18-34	-2.17-34	-3.89-34	-6.84-34	-1.19-33	-2.04-33
24	0.00+00	-4.75-38	-7.25-37	-2.63-36	-7.13-36	-1.67-35	-3.55-35	-7.13-35	-1.37-34	-2.56-34	-4.66-34	-8.38-34	-1.49-33	-2.65-33
23	0.00+00	-4.31-38	-7.81-37	-2.86-36	-7.83-36	-1.85-35	-3.97-35	-8.08-35	-1.58-34	-3.00-34	-5.59-34	-1.03-33	-1.90-33	-3.51-33
22	0.00+00	-3.66-38	-8.43-37	-3.13-36	-8.64-36	-2.05-35	-4.47-35	-9.22-35	-1.83-34	-3.56-34	-6.81-34	-1.30-33	-2.49-33	-4.84-33
21	0.00+00	-2.45-38	-8.99-37	-3.40-36	-9.46-36	-2.27-35	-5.01-35	-1.05-34	-2.13-34	-4.24-34	-8.38-34	-1.66-33	-3.36-33	-6.96-33
20	0.00+00	-4.06-39	-9.43-37	-3.64-36	-1.03-35	-2.49-35	-5.57-35	-1.19-34	-2.47-34	-5.08-34	-1.04-33	-2.18-33	-4.69-33	-1.06-32
19	0.00+00	2.76-38	-9.67-37	-3.85-36	-1.10-35	-2.70-35	-6.14-35	-1.34-34	-2.87-34	-6.11-34	-1.32-33	-2.94-33	-6.91-33	-1.77-32
18	0.00+00	7.42-38	-9.66-37	-4.00-36	-1.16-35	-2.89-35	-6.69-35	-1.50-34	-3.32-34	-7.43-34	-1.71-33	-4.15-33	-1.11-32	-3.44-32
17	0.00+00	1.39-37	-9.36-37	-4.09-36	-1.21-35	-3.06-35	-7.24-35	-1.67-34	-3.87-34	-9.20-34	-2.30-33	-6.33-33	-2.04-32	-8.99-32
16	0.00+00	2.27-37	-8.77-37	-4.14-36	-1.25-35	-3.22-35	-7.82-35	-1.88-34	-4.60-34	-1.19-33	-3.35-33	-1.11-32	-5.06-32	-5.01-31
15	0.00+00	3.43-37	-7.93-37	-4.18-36	-1.30-35	-3.41-35	-8.54-35	-2.15-34	-5.70-34	-1.65-33	-5.62-33	-2.62-32	-2.68-31	
14	0.00+00	5.00-37	-6.76-37	-4.22-36	-1.36-35	-3.67-35	-9.52-35	-2.57-34	-7.59-34	-2.64-33	-1.26-32	-1.32-31		
13	0.00+00	7.18-37	-4.98-37	-4.24-36	-1.43-35	-3.98-35	-1.09-34	-3.22-34	-1.13-33	-5.52-33	-5.90-32			
12	0.00+00	1.04-36	-1.88-37	-4.08-36	-1.48-35	-4.27-35	-1.24-34	-4.22-34	-2.04-33	-2.23-32				
11	0.00+00	1.54-36	4.03-37	-3.36-36	-1.39-35	-4.12-35	-1.23-34	-5.11-34	-5.21-33					
10	0.00+00	2.34-36	1.59-36	-1.18-36	-8.34-36	-1.79-35	2.10-35	1.10-33						
9	0.00+00	3.73-36	4.05-36	4.93-36	1.40-35	1.25-34	2.17-33							
8	0.00+00	6.24-36	9.48-36	2.28-35	1.12-34	1.53-33								
7	0.00+00	1.12-35	2.29-35	8.84-35	9.11-34									
6	0.00+00	2.27-35	6.72-35	5.81-34										
5	0.00+00	5.94-35	3.82-34											
4	0.00+00	3.00-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-9.85-35	-1.25-34	-1.53-34	-1.81-34	-2.07-34	-2.30-34	-2.51-34	-2.70-34	-2.79-34	-2.91-34	-2.99-34	-3.04-34	-3.04-34	-2.99-34
45	-1.51-34	-1.95-34	-2.43-34	-2.93-34	-3.42-34	-3.91-34	-4.39-34	-4.86-34	-5.22-34	-5.66-34	-6.10-34	-6.54-34	-6.97-34	-7.39-34
40	-2.52-34	-3.33-34	-4.27-34	-5.29-34	-6.39-34	-7.58-34	-8.87-34	-1.03-33	-1.17-33	-1.35-33	-1.56-33	-1.81-33	-2.12-33	-2.51-33
35	-4.73-34	-6.51-34	-8.69-34	-1.13-33	-1.44-33	-1.82-33	-2.28-33	-2.87-33	-3.58-33	-4.59-33	-6.03-33	-8.15-33	-1.15-32	-1.71-32
30	-1.08-33	-1.59-33	-2.28-33	-3.24-33	-4.58-33	-6.50-33	-9.41-33	-1.41-32	-2.18-32	-3.68-32	-6.96-32	-1.58-31	-4.99-31	-3.52-30
29	-1.31-33	-1.97-33	-2.90-33	-4.23-33	-6.18-33	-9.13-33	-1.39-32	-2.21-32	-3.74-32	-7.13-32	-1.63-31	-5.20-31	-3.69-30	
28	-1.63-33	-2.50-33	-3.78-33	-5.69-33	-8.64-33	-1.34-32	-2.17-32	-3.78-32	-7.20-32	-1.66-31	-5.35-31	-3.82-30		
27	-2.05-33	-3.23-33	-5.05-33	-7.91-33	-1.26-32	-2.09-32	-3.69-32	-7.24-32	-1.67-31	-5.42-31	-3.91-30			
26	-2.63-33	-4.29-33	-6.97-33	-1.15-32	-1.95-32	-3.52-32	-7.02-32	-1.66-31	-5.41-31	-3.93-30				
25	-3.46-33	-5.87-33	-1.00-32	-1.76-32	-3.26-32	-6.64-32	-1.60-31	-5.33-31	-3.90-30					
24	-4.69-33	-8.36-33	-1.52-32	-2.91-32	-6.10-32	-1.50-31	-5.07-31	-3.72-30						
23	-6.53-33	-1.28-32	-2.47-32	-5.33-32	-1.35-31	-4.65-31	-3.51-30							
22	-9.61-33	-1.99-32	-4.48-32	-1.17-31	-4.16-31	-3.22-30								
21	-1.51-32	-3.55-32	-9.65-32	-3.55-31	-2.82-30									
20	-2.61-32	-7.44-32	-2.85-31	-2.35-30										
19	-5.29-32	-2.13-31	-1.83-30											
18	-1.45-31	-1.31-30												
17	-8.53-31													

HE + TE = 1.50+04 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 1.331-12 4-3 RC = 2.012-13 4-3 EM = 8.529-25 2S RC = 4.103-13 2P RC = 9.205-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.17-03	1.59-03	6.81-04	3.53-04	2.06-04	1.30-04	8.78-05	6.18-05	4.52-05	3.40-05	2.63-05	2.07-05	1.66-05	1.35-05
45	7.11-03	2.18-03	9.38-04	4.86-04	2.83-04	1.79-04	1.21-04	8.51-05	6.22-05	4.68-05	3.61-05	2.85-05	2.28-05	1.86-05
40	1.02-02	3.12-03	1.34-03	6.95-04	4.05-04	2.57-04	1.73-04	1.22-04	8.89-05	6.69-05	5.16-05	4.07-05	3.26-05	2.65-05
35	1.53-02	4.69-03	2.01-03	1.04-03	6.08-04	3.85-04	2.59-04	1.82-04	1.33-04	1.00-04	7.74-05	6.09-05	4.88-05	3.97-05
30	2.44-02	7.49-03	3.22-03	1.67-03	9.71-04	6.15-04	4.14-04	2.91-04	2.13-04	1.60-04	1.23-04	9.71-05	7.78-05	6.32-05
29	2.71-02	8.30-03	3.57-03	1.85-03	1.08-03	6.81-04	4.58-04	3.23-04	2.36-04	1.77-04	1.37-04	1.08-04	8.61-05	7.00-05
28	3.01-02	9.24-03	3.97-03	2.05-03	1.20-03	7.58-04	5.10-04	3.59-04	2.62-04	1.97-04	1.52-04	1.19-04	9.56-05	7.77-05
27	3.36-02	1.03-02	4.43-03	2.29-03	1.34-03	8.46-04	5.69-04	4.00-04	2.92-04	2.20-04	1.69-04	1.33-04	1.07-04	8.66-05
26	3.77-02	1.16-02	4.96-03	2.57-03	1.50-03	9.47-04	6.37-04	4.48-04	3.27-04	2.46-04	1.90-04	1.49-04	1.19-04	9.68-05
25	4.24-02	1.30-02	5.56-03	2.89-03	1.68-03	1.06-03	7.16-04	5.04-04	3.68-04	2.76-04	2.13-04	1.67-04	1.34-04	1.09-04
24	4.79-02	1.47-02	6.30-03	3.26-03	1.90-03	1.20-03	8.08-04	5.68-04	4.15-04	3.12-04	2.40-04	1.89-04	1.51-04	1.22-04
23	5.43-02	1.66-02	7.14-03	3.70-03	2.15-03	1.36-03	9.15-04	6.44-04	4.70-04	3.53-04	2.72-04	2.13-04	1.71-04	1.38-04
22	6.18-02	1.89-02	8.13-03	4.20-03	2.45-03	1.55-03	1.04-03	7.32-04	5.34-04	4.01-04	3.09-04	2.42-04	1.93-04	1.57-04
21	7.06-02	2.16-02	9.28-03	4.80-03	2.80-03	1.77-03	1.19-03	8.35-04	6.09-04	4.57-04	3.52-04	2.76-04	2.20-04	1.78-04
20	8.06-02	2.47-02	1.06-02	5.49-03	3.20-03	2.02-03	1.36-03	9.54-04	6.95-04	5.22-04	4.01-04	3.14-04	2.50-04	2.02-04
19	9.25-02	2.84-02	1.22-02	6.29-03	3.66-03	2.32-03	1.55-03	1.09-03	7.96-04	5.97-04	4.58-04	3.58-04	2.85-04	2.29-04
18	1.06-01	3.25-02	1.40-02	7.22-03	4.20-03	2.66-03	1.78-03	1.25-03	9.11-04	6.82-04	5.23-04	4.08-04	3.23-04	2.58-04
17	1.22-01	3.73-02	1.60-02	8.26-03	4.81-03	3.04-03	2.04-03	1.43-03	1.04-03	7.78-04	5.95-04	4.62-04	3.63-04	2.85-04
16	1.39-01	4.25-02	1.82-02	9.42-03	5.48-03	3.46-03	2.32-03	1.63-03	1.18-03	8.81-04	6.71-04	5.18-04	4.00-04	2.95-04
15	1.57-01	4.80-02	2.06-02	1.06-02	6.19-03	3.91-03	2.62-03	1.83-03	1.33-03	9.87-04	7.46-04	5.66-04	4.12-04	
14	1.76-01	5.38-02	2.31-02	..19-02	6.94-03	4.37-03	2.92-03	2.04-03	1.48-03	1.09-03	8.10-04	5.79-04		
13	1.96-01	6.01-02	2.58-02	1.33-02	7.73-03	4.87-03	3.25-03	2.26-03	1.62-03	1.18-03	8.26-04			
12	2.20-01	6.76-02	2.90-02	1.50-02	8.69-03	5.47-03	3.64-03	2.52-03	1.78-03	1.21-03				
11	2.54-01	7.80-02	3.35-02	1.73-02	1.00-02	6.29-03	4.16-03	2.84-03	1.89-03					
10	3.04-01	9.35-02	4.02-02	2.08-02	1.20-02	7.52-03	4.90-03	3.15-03						
9	3.78-01	1.17-01	5.04-02	2.61-02	1.51-02	9.31-03	5.74-03							
8	4.89-01	1.52-01	6.62-02	3.44-02	1.97-02	1.16-02								
7	6.61-01	2.09-01	9.20-02	4.80-02	2.64-02									
6	9.59-01	3.09-01	1.39-01	7.04-02										
5	1.57+00	5.14-01	2.29-01											
4	3.13+00	1.00+00												
3	8.63+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.11-05	9.29-06	7.83-06	6.66-06	5.71-06	4.94-06	4.29-06	3.76-06	3.31-06	2.93-06	2.60-06	2.32-06	2.08-06	1.87-06
45	1.53-05	1.28-05	1.08-05	9.15-06	7.85-06	6.78-06	5.90-06	5.16-06	4.54-06	4.01-06	3.57-06	3.18-06	2.85-06	2.56-06
40	2.19-05	1.82-05	1.54-05	1.31-05	1.12-05	9.67-06	8.40-06	7.35-06	6.46-06	5.71-06	5.07-06	4.52-06	4.04-06	3.63-06
35	3.27-05	2.73-05	2.30-05	1.95-05	1.67-05	1.44-05	1.25-05	1.09-05	9.62-06	8.49-06	7.52-06	6.69-06	5.96-06	5.33-06
30	5.20-05	4.33-05	3.65-05	3.09-05	2.65-05	2.28-05	1.98-05	1.72-05	1.50-05	1.32-05	1.16-05	1.01-05	8.74-06	7.12-06
29	5.76-05	4.80-05	4.03-05	3.42-05	2.92-05	2.52-05	2.18-05	1.89-05	1.65-05	1.44-05	1.26-05	1.08-05	8.77-06	
28	6.40-05	5.32-05	4.47-05	3.79-05	3.24-05	2.79-05	2.41-05	2.09-05	1.81-05	1.57-05	1.35-05	1.09-05		
27	7.12-05	5.93-05	4.98-05	4.22-05	3.60-05	3.09-05	2.66-05	2.30-05	1.98-05	1.69-05	1.36-05			
26	7.96-05	6.62-05	5.56-05	4.70-05	4.01-05	3.43-05	2.95-05	2.53-05	2.14-05	1.72-05				
25	8.93-05	7.42-05	6.22-05	5.26-05	4.47-05	3.81-05	3.25-05	2.74-05	2.18-05					
24	1.00-04	8.34-05	6.98-05	5.88-05	4.98-05	4.21-05	3.53-05	2.80-05						
23	1.13-04	9.39-05	7.84-05	6.58-05	5.53-05	4.60-05	3.63-05							
22	1.28-04	1.06-04	8.81-05	7.34-05	6.06-05	4.75-05								
21	1.45-04	1.20-04	9.87-05	8.08-05	6.28-05									
20	1.64-04	1.34-04	1.09-04	8.39-05										
19	1.85-04	1.48-04	1.13-04											
18	2.04-04	1.55-04												
17	2.13-04													

HE + TE = 1.50+04 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.83-32	-7.12-39	-8.70-38	-2.97-37	-7.50-37	-1.61-36	-3.10-36	-5.46-36	-8.91-36	-1.35-35	-1.87-35	-2.37-35	-2.72-35	-2.87-35
45	6.63-32	-9.98-39	-1.21-37	-4.13-37	-1.05-36	-2.26-36	-4.38-36	-7.77-36	-1.28-35	-1.95-35	-2.74-35	-3.51-35	-4.10-35	-4.40-35
40	9.46-32	-1.46-38	-1.75-37	-6.00-37	-1.53-36	-3.33-36	-6.50-36	-1.17-35	-1.94-35	-3.00-35	-4.28-35	-5.58-35	-6.67-35	-7.35-35
35	1.42-31	-2.27-38	-2.67-37	-9.22-37	-2.37-36	-5.22-36	-1.03-35	-1.88-35	-3.18-35	-5.02-35	-7.32-35	-9.81-35	-1.21-34	-1.39-34
30	2.26-31	-3.77-38	-4.38-37	-1.52-36	-3.98-36	-8.90-36	-1.79-35	-3.34-35	-5.82-35	-9.48-35	-1.44-34	-2.01-34	-2.62-34	-3.20-34
29	2.50-31	-4.22-38	-4.88-37	-1.70-36	-4.47-36	-1.00-35	-2.03-35	-3.81-35	-6.68-35	-1.10-34	-1.68-34	-2.38-34	-3.15-34	-3.91-34
28	2.79-31	-4.73-38	-5.46-37	-1.91-36	-5.03-36	-1.14-35	-2.32-35	-4.37-35	-7.74-35	-1.28-34	-1.99-34	-2.86-34	-3.83-34	-4.87-34
27	3.11-31	-5.32-38	-6.14-37	-2.16-36	-5.70-36	-1.29-35	-2.66-35	-5.06-35	-9.03-35	-1.52-34	-2.38-34	-3.47-34	-4.74-34	-6.16-34
26	3.49-31	-6.01-38	-6.94-37	-2.45-36	-6.50-36	-1.48-35	-3.07-35	-5.89-35	-1.06-34	-1.81-34	-2.88-34	-4.28-34	-5.98-34	-7.96-34
25	3.93-31	-6.80-38	-7.86-37	-2.79-36	-7.44-36	-1.71-35	-3.57-35	-6.92-35	-1.27-34	-2.18-34	-3.54-34	-5.37-34	-7.68-34	-1.05-33
24	4.45-31	-7.71-38	-8.96-37	-3.19-36	-8.57-36	-1.99-35	-4.18-35	-8.21-35	-1.52-34	-2.67-34	-4.41-34	-6.86-34	-1.01-33	-1.44-33
23	5.07-31	-8.75-38	-1.02-36	-3.67-36	-9.93-36	-2.32-35	-4.95-35	-9.85-35	-1.85-34	-3.32-34	-5.62-34	-8.98-34	-1.37-33	-2.04-33
22	5.81-31	-9.92-38	-1.18-36	-4.24-36	-1.16-35	-2.74-35	-5.91-35	-1.19-34	-2.29-34	-4.20-34	-7.31-34	-1.21-33	-1.93-33	-3.02-33
21	6.70-31	-1.12-37	-1.36-36	-4.93-36	-1.36-35	-3.25-35	-7.12-35	-1.47-34	-2.88-34	-5.42-34	-9.76-34	-1.68-33	-2.83-33	-4.75-33
20	7.79-31	-1.24-37	-1.56-36	-5.73-36	-1.60-35	-3.88-35	-8.65-35	-1.82-34	-3.67-34	-7.14-34	-1.34-33	-2.44-33	-4.37-33	-8.03-33
19	9.12-31	-1.35-37	-1.80-36	-6.70-36	-1.89-35	-4.67-35	-1.06-34	-2.30-34	-4.79-34	-9.70-34	-1.92-33	-3.73-33	-7.33-33	-1.53-32
18	1.08-30	-1.42-37	-2.07-36	-7.83-36	-2.25-35	-5.65-35	-1.32-34	-2.94-34	-6.39-34	-1.36-33	-2.89-33	-6.14-33	-1.37-32	-3.47-32
17	1.29-30	-1.39-37	-2.37-36	-9.12-36	-2.67-35	-6.87-35	-1.65-34	-3.84-34	-8.77-34	-2.00-33	-4.64-33	-1.12-32	-3.04-32	-1.09-31
16	1.55-30	-1.16-37	-2.66-36	-1.05-35	-3.15-35	-8.35-35	-2.09-34	-5.09-34	-1.24-33	-3.11-33	-8.16-33	-2.41-32	-9.26-32	-3.88-31
15	1.90-30	-5.77-38	-2.92-36	-1.20-35	-3.68-35	-1.01-34	-2.65-34	-6.88-34	-1.84-33	-5.23-33	-1.68-32	-7.02-32	-6.09-31	
14	2.36-30	5.89-38	-3.09-36	-1.33-35	-4.23-35	-1.21-34	-3.38-34	-9.57-34	-2.90-33	-1.01-32	-4.59-32	-4.35-31		
13	2.99-30	2.61-37	-3.11-36	-1.44-35	-4.78-35	-1.45-34	-4.37-34	-1.40-33	-5.15-33	-2.53-32	-2.62-31			
12	3.86-30	5.80-37	-2.97-36	-1.53-35	-5.38-35	-1.76-34	-5.93-34	-2.29-33	-1.18-32	-1.32-31				
11	5.12-30	1.06-36	-2.70-36	-1.64-35	-6.24-35	-2.26-34	-9.10-34	-4.88-33	-5.65-32					
10	7.00-30	1.79-36	-2.26-36	-1.82-35	-7.76-35	-3.31-34	-1.84-33	-2.18-32						
9	9.97-30	3.02-36	-1.35-36	-2.08-35	-1.06-34	-6.13-34	-7.39-33							
8	1.50-29	5.30-36	1.08-36	-2.27-35	-1.61-34	-1.88-33								
7	2.42-29	1.01-35	8.79-36	-9.76-36	-1.44-34									
6	4.34-29	2.20-35	3.99-35	2.36-34										
5	9.28-29	6.05-35	2.79-34											
4	2.78-28	3.05-34												
3	2.01-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-2.77-35	-2.42-35	-1.82-35	-9.51-36	1.92-36	1.76-35	3.59-35	5.86-35	8.66-35	1.21-34	1.64-34	2.17-34	2.83-34	3.66-34
45	-4.36-35	-3.94-35	-3.14-35	-1.92-35	-2.45-36	2.16-35	5.06-35	8.81-35	1.36-34	1.98-34	2.78-34	3.83-34	5.20-34	7.01-34
40	-7.53-35	-7.14-35	-6.13-35	-4.40-35	-1.83-35	2.13-35	7.19-35	1.41-34	2.37-34	3.68-34	5.52-34	8.11-34	1.18-33	1.73-33
35	-1.50-34	-1.51-34	-1.43-34	-1.21-34	-8.28-35	-1.27-35	8.66-35	2.40-34	4.80-34	8.57-34	1.47-33	2.50-33	4.33-33	7.78-33
30	-3.72-34	-4.16-34	-4.48-34	-4.62-34	-4.46-34	-3.48-34	-1.59-34	2.60-34	1.18-33	3.32-33	8.86-33	2.62-32	1.03-31	8.72-31
29	-4.65-34	-5.34-34	-5.95-34	-6.42-34	-6.63-34	-5.91-34	-4.12-34	8.22-35	1.58-33	4.99-33	1.69-32	7.18-32	6.41-31	
28	-5.92-34	-7.01-34	-8.11-34	-9.21-34	-1.02-33	-1.03-33	-9.40-34	-4.43-34	1.37-33	8.19-33	4.25-32	4.20-31		
27	-7.71-34	-9.43-34	-1.14-33	-1.37-33	-1.64-33	-1.88-33	-2.12-33	-2.01-33	9.74-35	1.53-32	2.17-31			
26	-1.03-33	-1.31-33	-1.66-33	-2.13-33	-2.80-33	-3.66-33	-5.13-33	-7.48-33	-1.00-32	2.65-32				
25	-1.41-33	-1.89-33	-2.55-33	-3.54-33	-5.17-33	-7.96-33	-1.44-32	-3.38-32	-1.51-31					
24	-2.02-33	-2.85-33	-4.14-33	-6.36-33	-1.07-32	-2.07-32	-5.55-32	-3.18-31						
23	-3.02-33	-4.58-33	-7.32-33	-1.29-32	-2.67-32	-7.46-32	-4.65-31							
22	-4.79-33	-7.98-33	-1.46-32	-3.13-32	-9.28-32	-5.95-31								
21	-8.26-33	-1.56-32	-3.48-32	-1.06-31	-7.07-31									
20	-1.59-32	-3.65-32	-1.15-31	-7.90-31										
19	-3.67-32	-1.20-31	-8.49-31											
18	-1.18-31	-8.66-31												
17	-8.34-31													

HE + TE = 1.50+04 NE = 1.00+11 CASE B NC = 20

TOTAL RC = 1.521-12 4-3 RC = 2.143-13 4-3 EM = 9.084-25 2S RC = 4.542-13 2P RC = 1.067-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.85-03	1.49-03	6.40-04	3.31-04	1.93-04	1.22-04	8.24-05	5.81-05	4.25-05	3.20-05	2.47-05	1.94-05	1.56-05	1.27-05
45	6.68-03	2.05-03	8.81-04	4.56-04	2.66-04	1.69-04	1.13-04	8.00-05	5.84-05	4.40-05	3.40-05	2.67-05	2.14-05	1.74-05
40	9.57-03	2.93-03	1.26-03	6.53-04	3.81-04	2.41-04	1.62-04	1.14-04	8.36-05	6.29-05	4.85-05	3.82-05	3.06-05	2.49-05
35	1.44-02	4.41-03	1.90-03	9.82-04	5.73-04	3.63-04	2.44-04	1.72-04	1.26-04	9.45-05	7.29-05	5.74-05	4.60-05	3.74-05
30	2.31-02	7.09-03	3.04-03	1.58-03	9.19-04	5.82-04	3.91-04	2.75-04	2.01-04	1.51-04	1.17-04	9.18-05	7.35-05	5.98-05
29	2.56-02	7.87-03	3.38-03	1.75-03	1.02-03	6.46-04	4.34-04	3.06-04	2.23-04	1.68-04	1.29-04	1.02-04	8.16-05	6.63-05
28	2.86-02	8.77-03	3.77-03	1.95-03	1.14-03	7.19-04	4.84-04	3.41-04	2.49-04	1.87-04	1.44-04	1.13-04	9.08-05	7.38-05
27	3.20-02	9.81-03	4.21-03	2.18-03	1.27-03	8.05-04	5.41-04	3.81-04	2.78-04	2.09-04	1.61-04	1.27-04	1.01-04	8.24-05
26	3.60-02	1.10-02	4.74-03	2.45-03	1.43-03	9.04-04	6.08-04	4.28-04	3.12-04	2.35-04	1.81-04	1.42-04	1.14-04	9.24-05
25	4.06-02	1.25-02	5.35-03	2.77-03	1.61-03	1.02-03	6.86-04	4.83-04	3.52-04	2.65-04	2.04-04	1.60-04	1.28-04	1.04-04
24	4.61-02	1.41-02	6.07-03	3.14-03	1.83-03	1.16-03	7.78-04	5.48-04	4.00-04	3.00-04	2.31-04	1.82-04	1.45-04	1.18-04
23	5.26-02	1.61-02	6.93-03	3.58-03	2.09-03	1.32-03	8.88-04	6.24-04	4.56-04	3.42-04	2.64-04	2.07-04	1.65-04	1.34-04
22	6.04-02	1.85-02	7.95-03	4.11-03	2.40-03	1.52-03	1.02-03	7.16-04	5.22-04	3.92-04	3.02-04	2.37-04	1.89-04	1.53-04
21	6.98-02	2.14-02	9.19-03	4.75-03	2.77-03	1.75-03	1.18-03	8.27-04	6.03-04	4.53-04	3.48-04	2.73-04	2.18-04	1.76-04
20	8.12-02	2.49-02	1.07-02	5.53-03	3.22-03	2.03-03	1.37-03	9.60-04	7.00-04	5.25-04	4.03-04	3.16-04	2.52-04	2.03-04
19	9.52-02	2.92-02	1.25-02	6.47-03	3.77-03	2.38-03	1.60-03	1.12-03	8.18-04	6.13-04	4.71-04	3.68-04	2.92-04	2.35-04
18	1.12-01	3.45-02	1.48-02	7.64-03	4.45-03	2.81-03	1.88-03	1.32-03	9.63-04	7.21-04	5.53-04	4.31-04	3.41-04	2.72-04
17	1.34-01	4.10-02	1.76-02	9.09-03	5.29-03	3.34-03	2.24-03	1.57-03	1.14-03	8.54-04	6.53-04	5.07-04	3.98-04	3.12-04
16	1.60-01	4.91-02	2.11-02	1.09-02	6.33-03	4.00-03	2.68-03	1.88-03	1.36-03	1.02-03	7.73-04	5.97-04	4.60-04	3.39-04
15	1.94-01	5.93-02	2.54-02	1.31-02	7.62-03	4.81-03	3.22-03	2.25-03	1.63-03	1.21-03	9.15-04	6.94-04	5.04-04	
14	2.34-01	7.17-02	3.07-02	1.59-02	9.21-03	5.80-03	3.88-03	2.71-03	1.95-03	1.44-03	1.07-03	7.63-04		
13	2.83-01	8.67-02	3.71-02	1.92-02	1.11-02	6.99-03	4.66-03	3.24-03	2.32-03	1.68-03	1.18-03			
12	3.40-01	1.04-01	4.44-02	2.29-02	1.33-02	8.32-03	5.53-03	3.82-03	2.69-03	1.83-03				
11	3.99-01	1.22-01	5.22-02	2.68-02	1.55-02	9.70-03	6.40-03	4.34-03	2.88-03					
10	4.59-01	1.40-01	5.98-02	3.07-02	1.77-02	1.10-02	7.13-03	4.56-03						
9	5.26-01	1.61-01	6.85-02	3.51-02	2.01-02	1.23-02	7.50-03							
8	6.32-01	1.93-01	8.21-02	4.18-02	2.36-02	1.36-02								
7	8.20-01	2.50-01	1.06-01	5.34-02	2.85-02									
6	1.16+00	3.54-01	1.49-01	7.14-02										
5	1.83+00	5.57-01	2.26-01											
4	3.49+00	1.00+00												
3	9.07+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.05-05	8.73-06	7.36-06	6.26-06	5.37-06	4.64-06	4.03-06	3.53-06	3.11-06	2.75-06	2.44-06	2.18-06	1.95-06	1.76-06
45	1.44-05	1.20-05	1.01-05	8.60-06	7.37-06	6.37-06	5.54-06	4.85-06	4.26-06	3.77-06	3.35-06	2.99-06	2.68-06	2.41-06
40	2.06-05	1.71-05	1.44-05	1.23-05	1.05-05	9.09-06	7.90-06	6.91-06	6.08-06	5.37-06	4.77-06	4.25-06	3.80-06	3.42-06
35	3.08-05	2.57-05	2.16-05	1.84-05	1.57-05	1.36-05	1.18-05	1.03-05	9.06-06	7.99-06	7.08-06	6.30-06	5.62-06	5.02-06
30	4.92-05	4.10-05	3.45-05	2.93-05	2.50-05	2.16-05	1.87-05	1.63-05	1.42-05	1.25-05	1.09-05	9.57-06	8.26-06	6.74-06
29	5.46-05	4.54-05	3.82-05	3.24-05	2.77-05	2.38-05	2.06-05	1.79-05	1.56-05	1.37-05	1.19-05	1.02-05	8.31-06	
28	6.07-05	5.05-05	4.25-05	3.60-05	3.08-05	2.64-05	2.28-05	1.98-05	1.72-05	1.49-05	1.28-05	1.03-05		
27	6.78-05	5.64-05	4.74-05	4.01-05	3.42-05	2.94-05	2.53-05	2.19-05	1.89-05	1.61-05	1.29-05			
26	7.60-05	6.32-05	5.30-05	4.49-05	3.82-05	3.27-05	2.81-05	2.41-05	2.04-05	1.64-05				
25	8.56-05	7.11-05	5.96-05	5.04-05	4.28-05	3.65-05	3.11-05	2.62-05	2.09-05					
24	9.68-05	8.03-05	6.72-05	5.67-05	4.80-05	4.06-05	3.40-05	2.70-05						
23	1.10-04	9.11-05	7.61-05	6.39-05	5.36-05	4.46-05	3.52-05							
22	1.25-04	1.04-04	8.62-05	7.19-05	5.93-05	4.64-05								
21	1.44-04	1.18-04	9.77-05	8.00-05	6.21-05									
20	1.65-04	1.35-04	1.09-04	8.44-05										
19	1.90-04	1.52-04	1.16-04											
18	2.16-04	1.63-04												
17	2.33-04													

HE + TE = 1.50+04 NE = 1.00+11 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.47-32	-8.59-39	-8.63-38	-2.79-37	-6.79-37	-1.39-36	-2.43-36	-3.55-36	-4.07-36	-3.34-36	-1.13-36	2.47-36	7.38-36	1.36-35
45	7.51-32	-1.20-38	-1.20-37	-3.89-37	-9.50-37	-1.95-36	-3.44-36	-5.07-36	-5.90-36	-4.97-36	-1.91-36	3.21-36	1.03-35	1.95-35
40	1.07-31	-1.76-38	-1.74-37	-5.66-37	-1.39-36	-2.88-36	-5.13-36	-7.66-36	-9.08-36	-7.91-36	-3.52-36	4.12-36	1.50-35	2.95-35
35	1.60-31	-2.73-38	-2.66-37	-8.72-37	-2.16-36	-4.53-36	-8.18-36	-1.25-35	-1.52-35	-1.39-35	-7.31-36	4.85-36	2.30-35	4.82-35
30	2.56-31	-4.58-38	-4.39-37	-1.45-36	-3.66-36	-7.80-36	-1.44-35	-2.26-35	-2.87-35	-2.81-35	-1.81-35	2.92-36	3.70-35	8.77-35
29	2.84-31	-5.14-38	-4.91-37	-1.63-36	-4.12-36	-8.82-36	-1.64-35	-2.59-35	-3.32-35	-3.32-35	-2.23-35	1.37-36	4.07-35	1.01-34
28	3.16-31	-5.80-38	-5.52-37	-1.83-36	-4.66-36	-1.00-35	-1.88-35	-2.99-35	-3.88-35	-3.95-35	-2.79-35	-1.07-36	4.47-35	1.16-34
27	3.53-31	-6.57-38	-6.23-37	-2.08-36	-5.30-36	-1.15-35	-2.17-35	-3.48-35	-4.59-35	-4.77-35	-3.52-35	-4.88-36	4.87-35	1.35-34
26	3.95-31	-7.50-38	-7.07-37	-2.37-36	-6.07-36	-1.33-35	-2.52-35	-4.09-35	-5.47-35	-5.82-35	-4.53-35	-1.08-35	5.26-35	1.58-34
25	4.46-31	-8.60-38	-8.06-37	-2.71-36	-7.00-36	-1.54-35	-2.95-35	-4.86-35	-6.61-35	-7.22-35	-5.92-35	-2.01-35	5.54-35	1.87-34
24	5.05-31	-9.93-38	-9.26-37	-3.13-36	-8.14-36	-1.81-35	-3.50-35	-5.85-35	-8.10-35	-9.11-35	-7.89-35	-3.50-35	5.57-35	2.23-34
23	5.75-31	-1.15-37	-1.07-36	-3.64-36	-9.54-36	-2.14-35	-4.20-35	-7.12-35	-1.01-34	-1.17-34	-1.08-34	-5.92-35	5.04-35	2.67-34
22	6.59-31	-1.35-37	-1.25-36	-4.27-36	-1.13-35	-2.56-35	-5.10-35	-8.81-35	-1.28-34	-1.54-34	-1.51-34	-9.96-35	3.24-35	3.18-34
21	7.60-31	-1.60-37	-1.47-36	-5.06-36	-1.35-35	-3.10-35	-6.28-35	-1.11-34	-1.66-34	-2.08-34	-2.18-34	-1.70-34	-1.34-35	3.74-34
20	8.83-31	-1.90-37	-1.74-36	-6.05-36	-1.63-35	-3.81-35	-7.87-35	-1.43-34	-2.20-34	-2.90-34	-3.26-34	-2.96-34	-1.21-34	4.16-34
19	1.03-30	-2.28-37	-2.08-36	-7.32-36	-2.01-35	-4.76-35	-1.01-34	-1.88-34	-3.02-34	-4.20-34	-5.15-34	-5.45-34	-3.96-34	3.24-34
18	1.22-30	-2.75-37	-2.52-36	-8.96-36	-2.50-35	-6.06-35	-1.32-34	-2.55-34	-4.30-34	-6.39-34	-8.64-34	-1.08-33	-1.15-33	-4.18-34
17	1.46-30	-3.35-37	-3.08-36	-1.11-35	-3.16-35	-7.87-35	-1.77-34	-3.58-34	-6.41-34	-1.03-33	-1.58-33	-2.37-33	-3.64-33	-5.37-33
16	1.76-30	-4.10-37	-3.81-36	-1.40-35	-4.07-35	-1.05-34	-2.46-34	-5.25-34	-1.01-33	-1.82-33	-3.23-33	-6.24-33	-1.51-32	-6.91-32
15	2.16-30	-5.00-37	-4.75-36	-1.78-35	-5.35-35	-1.43-34	-3.55-34	-8.14-34	-1.73-33	-3.58-33	-7.95-33	-2.27-32	-1.34-31	
14	2.68-30	-6.02-37	-5.95-36	-2.30-35	-7.18-35	-2.02-34	-5.36-34	-1.35-33	-3.31-33	-8.45-33	-2.71-32	-1.81-31		
13	3.39-30	-6.99-37	-7.46-36	-2.99-35	-9.79-35	-2.95-34	-8.58-34	-2.48-33	-7.47-33	-2.74-32	-2.03-31			
12	4.38-30	-7.44-37	-9.20-36	-3.88-35	-1.35-34	-4.46-34	-1.48-33	-5.28-33	-2.28-32	-1.92-31				
11	5.80-30	-6.34-37	-1.10-35	-4.95-35	-1.88-34	-7.05-34	-2.88-33	-1.47-32	-1.46-31					
10	7.94-30	-1.89-37	-1.22-35	-6.11-35	-2.63-34	-1.20-33	-6.99-33	-8.23-32						
9	1.13-29	8.06-37	-1.28-35	-7.47-35	-3.87-34	-2.48-33	-3.29-32							
8	1.70-29	2.66-36	-1.32-35	-9.92-35	-7.14-34	-1.02-32								
7	2.74-29	6.38-36	-1.36-35	-1.67-34	-2.65-33									
6	4.92-29	1.57-35	-1.06-35	-4.97-34										
5	1.05-28	4.84-35	5.39-35											
4	3.15-28	2.66-34												
3	2.28-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.12-35	3.04-35	4.15-35	5.48-35	7.09-35	9.04-35	1.14-34	1.42-34	1.76-34	2.18-34	2.69-34	3.31-34	4.09-34	5.05-34
45	3.10-35	4.51-35	6.25-35	8.39-35	1.10-34	1.43-34	1.84-34	2.34-34	2.98-34	3.78-34	4.80-34	6.11-34	7.81-34	1.00-33
40	4.82-35	7.19-35	1.02-34	1.40-34	1.89-34	2.53-34	3.35-34	4.42-34	5.85-34	7.75-34	1.04-33	1.39-33	1.90-33	2.63-33
35	8.21-35	1.27-34	1.88-34	2.69-34	3.90-34	5.34-34	7.48-34	1.05-33	1.50-33	2.18-33	3.22-33	4.92-33	7.83-33	1.32-32
30	1.62-34	2.69-34	4.26-34	6.61-34	1.02-33	1.60-33	2.54-33	4.18-33	7.23-33	1.35-32	2.81-32	7.00-32	2.43-31	1.87-30
29	1.90-34	3.22-34	5.23-34	8.32-34	1.32-33	2.15-33	3.58-33	6.24-33	1.17-32	2.46-32	6.16-32	2.15-31	1.67-30	
28	2.25-34	3.93-34	6.54-34	1.07-33	1.77-33	3.01-33	5.32-33	1.01-32	2.13-32	5.38-32	1.89-31	1.47-30		
27	2.71-34	4.87-34	8.38-34	1.43-33	2.47-33	4.46-33	8.57-33	1.83-32	4.65-32	1.64-31	1.28-30			
26	3.32-34	6.18-34	1.11-33	1.98-33	3.64-33	7.14-33	1.54-32	3.96-32	1.41-31	1.11-30				
25	4.13-34	8.06-34	1.52-33	2.89-33	5.78-33	1.28-32	3.33-32	1.20-31	9.50-31					
24	5.25-34	1.09-33	2.19-33	4.54-33	1.03-32	2.73-32	9.96-32	7.96-31						
23	6.87-34	1.54-33	3.39-33	7.96-33	2.17-32	8.09-32	6.60-31							
22	9.30-34	2.31-33	5.81-33	1.65-32	6.34-32	5.27-31								
21	1.32-33	3.82-33	1.18-32	4.74-32	4.11-31									
20	2.00-33	7.39-33	3.27-32	2.98-31										
19	3.29-33	1.88-32	1.93-31											
18	6.02-33	9.63-32												
17	8.35-33													

HE + TE = 1.50+04 NE = 1.00+12 CASE B NC = 20

TOTAL RC = 1.916-12 4-3 RC = 2.716-13 4-3 EM = 1.151-24 2S RC = 4.748-13 2P RC = 1.442-12

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.83-03	1.18-03	5.05-04	2.62-04	1.53-04	9.67-05	6.50-05	4.58-05	3.35-05	2.52-05	1.95-05	1.53-05	1.23-05	1.00-05
45	5.27-03	1.62-03	6.95-04	3.60-04	2.10-04	1.33-04	8.95-05	6.31-05	4.61-05	3.47-05	2.68-05	2.11-05	1.69-05	1.38-05
40	7.55-03	2.32-03	9.95-04	5.15-04	3.01-04	1.90-04	1.28-04	9.03-05	6.60-05	4.97-05	3.83-05	3.02-05	2.42-05	1.97-05
35	1.14-02	3.48-03	1.50-03	7.75-04	4.52-04	2.86-04	1.93-04	1.36-04	9.91-05	7.46-05	5.75-05	4.53-05	3.63-05	2.95-05
30	1.83-02	5.60-03	2.41-03	1.25-03	7.26-04	4.60-04	3.09-04	2.18-04	1.59-04	1.20-04	9.22-05	7.26-05	5.81-05	4.72-05
29	2.03-02	6.22-03	2.67-03	1.38-03	8.06-04	5.10-04	3.43-04	2.42-04	1.76-04	1.33-04	1.02-04	8.05-05	6.45-05	5.24-05
28	2.26-02	6.93-03	2.98-03	1.54-03	8.98-04	5.69-04	3.82-04	2.69-04	1.97-04	1.48-04	1.14-04	8.97-05	7.18-05	5.83-05
27	2.53-02	7.76-03	3.33-03	1.73-03	1.01-03	6.36-04	4.26-04	3.01-04	2.20-04	1.65-04	1.28-04	1.00-04	8.02-05	6.52-05
26	2.85-02	8.73-03	3.75-03	1.94-03	1.13-03	7.16-04	4.81-04	3.39-04	2.47-04	1.86-04	1.43-04	1.13-04	9.01-05	7.32-05
25	3.22-02	9.86-03	4.24-03	2.19-03	1.28-03	8.08-04	5.43-04	3.82-04	2.79-04	2.10-04	1.62-04	1.27-04	1.02-04	8.25-05
24	3.66-02	1.12-02	4.81-03	2.49-03	1.45-03	9.18-04	6.17-04	4.34-04	3.17-04	2.38-04	1.83-04	1.44-04	1.15-04	9.34-05
23	4.18-02	1.28-02	5.50-03	2.85-03	1.66-03	1.05-03	7.05-04	4.96-04	3.62-04	2.72-04	2.09-04	1.64-04	1.31-04	1.06-04
22	4.81-02	1.47-02	6.33-03	3.27-03	1.91-03	1.21-03	8.10-04	5.70-04	4.16-04	3.12-04	2.40-04	1.89-04	1.50-04	1.22-04
21	5.57-02	1.71-02	7.33-03	3.79-03	2.21-03	1.40-03	9.38-04	6.59-04	4.81-04	3.61-04	2.78-04	2.18-04	1.74-04	1.40-04
20	6.50-02	1.99-02	8.55-03	4.42-03	2.58-03	1.63-03	1.09-03	7.69-04	5.60-04	4.20-04	3.23-04	2.53-04	2.01-04	1.62-04
19	7.66-02	2.35-02	1.01-02	5.21-03	3.03-03	1.92-03	1.29-03	9.04-04	6.58-04	4.93-04	3.79-04	2.96-04	2.35-04	1.89-04
18	9.11-02	2.79-02	1.20-02	6.19-03	3.60-03	2.28-03	1.53-03	1.07-03	7.80-04	5.84-04	4.48-04	3.49-04	2.76-04	2.20-04
17	1.10-01	3.36-02	1.44-02	7.44-03	4.33-03	2.73-03	1.83-03	1.29-03	9.34-04	6.99-04	5.34-04	4.15-04	3.26-04	2.55-04
16	1.33-01	4.08-02	1.75-02	9.04-03	5.26-03	3.32-03	2.22-03	1.56-03	1.13-03	8.43-04	6.42-04	4.95-04	3.82-04	2.82-04
15	1.64-01	5.03-02	2.16-02	1.11-02	6.47-03	4.08-03	2.73-03	1.91-03	1.38-03	1.03-03	7.77-04	5.89-04	4.27-04	
14	2.06-01	6.30-02	2.70-02	1.39-02	8.08-03	5.09-03	3.40-03	2.37-03	1.71-03	1.26-03	9.37-04	6.69-04		
13	2.62-01	8.00-02	3.43-02	1.77-02	1.02-02	6.44-03	4.29-03	2.98-03	2.14-03	1.55-03	1.08-03			
12	3.38-01	1.03-01	4.42-02	2.28-02	1.32-02	8.26-03	5.49-03	3.78-03	2.66-03	1.82-03				
11	4.42-01	1.35-01	5.77-02	2.97-02	1.71-02	1.07-02	7.05-03	4.78-03	3.16-03					
10	5.81-01	1.77-01	7.56-02	3.88-02	2.23-02	1.38-02	8.96-03	5.72-03						
9	7.52-01	2.29-01	9.75-02	4.98-02	2.84-02	1.73-02	1.06-02							
8	9.30-01	2.83-01	1.20-01	6.08-02	3.41-02	1.96-02								
7	1.10+00	3.33-01	1.40-01	6.99-02	3.70-02									
6	1.37+00	4.12-01	1.71-01	8.05-02										
5	2.00+00	5.92-01	2.32-01											
4	3.58+00	1.00+00												
3	9.03+00													

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.25-06	6.89-06	5.80-06	4.94-06	4.23-06	3.66-06	3.18-06	2.79-06	2.45-06	2.17-06	1.93-06	1.72-06	1.54-06	1.39-06
45	1.14-05	9.47-06	7.98-06	6.79-06	5.82-06	5.03-06	4.37-06	3.83-06	3.37-06	2.98-06	2.64-06	2.36-06	2.11-06	1.90-06
40	1.62-05	1.35-05	1.14-05	9.69-06	8.31-06	7.17-06	6.24-06	5.45-06	4.80-06	4.24-06	3.76-06	3.35-06	3.00-06	2.70-06
35	2.43-05	2.03-05	1.71-05	1.45-05	1.24-05	1.07-05	9.32-06	8.14-06	7.15-06	6.31-06	5.59-06	4.97-06	4.43-06	3.96-06
30	3.89-05	3.24-05	2.73-05	2.31-05	1.98-05	1.70-05	1.48-05	1.29-05	1.12-05	9.85-06	8.65-06	7.56-06	6.53-06	5.32-06
29	4.31-05	3.59-05	3.02-05	2.56-05	2.19-05	1.88-05	1.63-05	1.42-05	1.24-05	1.08-05	9.41-06	8.09-06	6.57-06	
28	4.80-05	4.00-05	3.36-05	2.85-05	2.43-05	2.09-05	1.81-05	1.57-05	1.36-05	1.18-05	1.01-05	8.17-06		
27	5.36-05	4.46-05	3.75-05	3.17-05	2.71-05	2.33-05	2.00-05	1.73-05	1.49-05	1.27-05	1.02-05			
26	6.02-05	5.00-05	4.20-05	3.55-05	3.03-05	2.59-05	2.23-05	1.91-05	1.62-05	1.30-05				
25	6.78-05	5.63-05	4.72-05	3.99-05	3.39-05	2.89-05	2.46-05	2.08-05	1.66-05					
24	7.67-05	6.37-05	5.33-05	4.49-05	3.80-05	3.22-05	2.70-05	2.14-05						
23	8.73-05	7.23-05	6.04-05	5.07-05	4.26-05	3.54-05	2.79-05							
22	9.98-05	8.25-05	6.86-05	5.72-05	4.72-05	3.69-05								
21	1.15-04	9.44-05	7.79-05	6.38-05	4.96-05									
20	1.32-04	1.08-04	8.76-05	6.75-05										
19	1.53-04	1.23-04	9.36-05											
18	1.75-04	1.32-04												
17	1.91-04													

HE + TE = 1.50+04 NE = 1.00+12 CASE B NC = 20

TABLE OF LINE CENTER OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.34-32	-9.84-39	-7.26-38	-2.14-37	-4.37-37	-5.24-37	5.70-38	1.59-36	3.94-36	6.98-36	1.07-35	1.52-35	2.06-35	2.72-35
45	8.71-32	-1.37-38	-1.01-37	-2.99-37	-6.14-37	-7.46-37	5.04-38	2.19-36	5.52-36	9.88-36	1.53-35	2.19-35	3.00-35	3.99-35
40	1.24-31	-2.00-38	-1.47-37	-4.37-37	-9.04-37	-1.12-36	1.29-38	3.15-36	8.10-36	1.47-35	2.30-35	3.34-35	4.64-35	6.26-35
35	1.86-31	-3.10-38	-2.25-37	-6.77-37	-1.42-36	-1.81-36	-1.21-37	4.74-36	1.26-35	2.34-35	3.73-35	5.53-35	7.85-35	1.08-34
30	2.97-31	-5.18-38	-3.73-37	-1.14-36	-2.43-36	-3.22-36	-5.83-37	7.60-36	2.14-35	4.10-35	6.77-35	1.04-34	1.53-34	2.20-34
29	3.29-31	-5.81-38	-4.18-37	-1.28-36	-2.74-36	-3.68-36	-7.71-37	8.43-36	2.41-35	4.67-35	7.77-35	1.20-34	1.79-34	2.61-34
28	3.66-31	-6.55-38	-4.70-37	-1.44-36	-3.11-36	-4.23-36	-1.02-36	9.37-36	2.73-35	5.34-35	8.99-35	1.41-34	2.12-34	3.13-34
27	4.09-31	-7.43-38	-5.32-37	-1.64-36	-3.56-36	-4.89-36	-1.35-36	1.05-35	3.11-35	6.17-35	1.05-34	1.66-34	2.54-34	3.81-34
26	4.58-31	-8.47-38	-6.05-37	-1.87-36	-4.09-36	-5.71-36	-1.79-36	1.17-35	3.57-35	7.18-35	1.24-34	1.99-34	3.09-34	4.73-34
25	5.17-31	-9.72-38	-6.92-37	-2.15-36	-4.75-36	-6.72-36	-2.38-36	1.31-35	4.13-35	8.43-35	1.48-34	2.41-34	3.82-34	5.99-34
24	5.85-31	-1.12-37	-7.98-37	-2.49-36	-5.55-36	-8.00-36	-3.20-36	1.48-35	4.81-35	1.00-34	1.79-34	2.98-34	4.83-34	7.80-34
23	6.66-31	-1.31-37	-9.27-37	-2.91-36	-6.56-36	-9.63-36	-4.34-36	1.66-35	5.66-35	1.21-34	2.20-34	3.75-34	6.26-34	1.05-33
22	7.63-31	-1.54-37	-1.09-36	-3.44-36	-7.83-36	-1.18-35	-5.95-36	1.88-35	6.72-35	1.47-34	2.76-34	4.85-34	8.39-34	1.47-33
21	8.80-31	-1.82-37	-1.28-36	-4.10-36	-9.46-36	-1.46-35	-8.27-36	2.11-35	8.08-35	1.83-34	3.54-34	6.46-34	1.17-33	2.17-33
20	1.02-30	-2.18-37	-1.53-36	-4.95-36	-1.16-35	-1.83-35	-1.17-35	2.36-35	9.86-35	2.33-34	4.68-34	8.96-34	1.72-33	3.47-33
19	1.20-30	-2.65-37	-1.86-36	-6.06-36	-1.44-35	-2.36-35	-1.69-35	2.59-35	1.22-34	3.03-34	6.43-34	1.31-33	2.73-33	6.19-33
18	1.42-30	-3.26-37	-2.28-36	-7.54-36	-1.84-35	-3.11-35	-2.50-35	2.73-35	1.54-34	4.09-34	9.26-34	2.05-33	4.83-33	1.32-32
17	1.69-30	-4.07-37	-2.84-36	-9.55-36	-2.38-35	-4.21-35	-3.83-35	2.62-35	1.97-34	5.75-34	1.43-33	3.58-33	1.02-32	3.88-32
16	2.04-30	-5.17-37	-3.61-36	-1.24-35	-3.18-35	-5.89-35	-6.08-35	1.83-35	2.58-34	8.57-34	2.43-33	7.39-33	2.94-32	2.51-31
15	2.50-30	-6.68-37	-4.67-36	-1.64-35	-4.38-35	-8.59-35	-1.01-34	-6.97-36	3.44-34	1.39-33	4.86-33	2.09-32	1.86-31	
14	3.10-30	-8.83-37	-6.21-36	-2.24-35	-6.26-35	-1.32-34	-1.80-34	-8.04-35	4.56-34	2.56-33	1.31-32	1.27-31		
13	3.93-30	-1.19-36	-8.46-36	-3.18-35	-9.38-35	-2.16-34	-3.47-34	-3.02-34	5.29-34	5.98-33	7.33-32			
12	5.07-30	-1.64-36	-1.19-35	-4.69-35	-1.49-34	-3.84-34	-7.53-34	-1.08-33	-1.69-34	2.50-32				
11	6.72-30	-2.29-36	-1.72-35	-7.25-35	-2.54-34	-7.63-34	-1.95-33	-4.83-33	-1.60-32					
10	9.20-30	-3.17-36	-2.55-35	-1.18-34	-4.74-34	-1.79-33	-6.90-33	-4.44-32						
9	1.31-29	-4.17-36	-3.78-35	-1.99-34	-9.97-34	-5.54-33	-5.14-32							
8	1.97-29	-4.58-36	-5.35-35	-3.49-34	-2.54-33	-3.35-32								
7	3.17-29	-2.83-36	-7.01-35	-6.67-34	-1.13-32									
6	5.70-29	3.27-36	-9.70-35	-2.22-33										
5	1.22-28	2.48-35	-2.11-34											
4	3.65-28	1.94-34												
3	2.64-27													

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.50-35	4.44-35	5.57-35	6.94-35	8.58-35	1.06-34	1.30-34	1.59-34	1.94-34	2.36-34	2.89-34	3.53-34	4.32-34	5.31-34
45	5.20-35	6.68-35	8.49-35	1.07-34	1.35-34	1.69-34	2.11-34	2.64-34	3.30-34	4.13-34	5.19-34	6.54-34	8.30-34	1.06-33
40	8.30-35	1.09-34	1.41-34	1.82-34	2.34-34	3.02-34	3.89-34	5.03-34	6.53-34	8.55-34	1.13-33	1.50-33	2.04-33	2.80-33
35	1.48-34	1.99-34	2.67-34	3.58-34	4.80-34	6.49-34	8.85-34	1.22-33	1.71-33	2.43-33	3.56-33	5.39-33	8.50-33	1.42-32
30	3.14-34	4.46-34	6.37-34	9.18-34	1.34-33	2.01-33	3.10-33	4.98-33	8.44-33	1.55-32	3.18-32	7.84-32	2.70-31	2.06-30
29	3.77-34	5.45-34	7.93-34	1.17-33	1.76-33	2.73-33	4.41-33	7.51-33	1.38-32	2.85-32	7.04-32	2.43-31	1.86-30	
28	4.60-34	6.78-34	1.01-33	1.53-33	2.39-33	3.88-33	6.64-33	1.23-32	2.54-32	6.29-32	2.17-31	1.67-30		
27	5.71-34	8.62-34	1.32-33	2.08-33	3.39-33	5.84-33	1.08-32	2.25-32	5.60-32	1.94-31	1.49-30			
26	7.25-34	1.13-33	1.79-33	2.94-33	5.09-33	9.50-33	1.98-32	4.95-32	1.72-31	1.33-30				
25	9.45-34	1.52-33	2.52-33	4.40-33	8.26-33	1.73-32	4.35-32	1.52-31	1.18-30					
24	1.27-33	2.14-33	3.77-33	7.13-33	1.51-32	3.80-32	1.33-31	1.04-30						
23	1.79-33	3.19-33	6.09-33	1.30-32	3.29-32	1.16-31	9.06-31							
22	2.66-33	5.14-33	1.10-32	2.82-32	1.00-31	7.87-31								
21	4.27-33	9.27-33	2.40-32	8.57-32	6.78-31									
20	7.67-33	2.01-32	7.24-32	5.77-31										
19	1.65-32	6.02-32	4.84-31											
18	4.90-32	3.99-31												
17	3.22-31													

NE + TE = 1.50+04 NE = 1.00+13 CASE B NC = 20

TOTAL RC = 2.821-12 4-3 RC = 4.330-13 4-3 EM = 1.835-24 2S RC = 6.122-13 2P RC = 2.209-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.40-03	7.37-04	3.17-04	1.64-04	9.57-05	6.06-05	4.08-05	2.88-05	2.10-05	1.58-05	1.22-05	9.62-06	7.72-06	6.28-06
45	3.31-03	1.02-03	4.36-04	2.26-04	1.32-04	8.35-05	5.62-05	3.96-05	2.89-05	2.18-05	1.68-05	1.32-05	1.06-05	8.64-06
40	4.74-03	1.45-03	6.24-04	3.23-04	1.89-04	1.19-04	8.04-05	5.66-05	4.14-05	3.12-05	2.40-05	1.89-05	1.52-05	1.23-05
35	7.13-03	2.19-03	9.39-04	4.86-04	2.84-04	1.80-04	1.21-04	8.51-05	6.22-05	4.68-05	3.61-05	2.84-05	2.28-05	1.85-05
30	1.15-02	3.51-03	1.51-03	7.81-04	4.56-04	2.88-04	1.94-04	1.37-04	9.98-05	7.51-05	5.79-05	4.55-05	3.65-05	2.96-05
29	1.27-02	3.90-03	1.68-03	8.68-04	5.06-04	3.20-04	2.15-04	1.52-04	1.11-04	8.33-05	6.42-05	5.05-05	4.05-05	3.29-05
28	1.42-02	4.35-03	1.87-03	9.67-04	5.64-04	3.57-04	2.40-04	1.69-04	1.23-04	9.28-05	7.15-05	5.63-05	4.51-05	3.66-05
27	1.59-02	4.87-03	2.09-03	1.08-03	6.31-04	4.00-04	2.69-04	1.89-04	1.38-04	1.04-04	8.00-05	6.29-05	5.04-05	4.09-05
26	1.79-02	5.48-03	2.35-03	1.22-03	7.10-04	4.49-04	3.02-04	2.13-04	1.55-04	1.17-04	8.99-05	7.07-05	5.66-05	4.59-05
25	2.02-02	6.19-03	2.66-03	1.38-03	8.02-04	5.08-04	3.41-04	2.40-04	1.75-04	1.32-04	1.02-04	7.98-05	6.38-05	5.18-05
24	2.30-02	7.04-03	3.02-03	1.56-03	9.11-04	5.77-04	3.87-04	2.73-04	1.99-04	1.50-04	1.15-04	9.05-05	7.23-05	5.87-05
23	2.62-02	8.05-03	3.45-03	1.79-03	1.04-03	6.59-04	4.43-04	3.11-04	2.27-04	1.71-04	1.31-04	1.03-04	8.25-05	6.68-05
22	3.02-02	9.26-03	3.98-03	2.06-03	1.20-03	7.58-04	5.09-04	3.58-04	2.61-04	1.96-04	1.51-04	1.18-04	9.46-05	7.66-05
21	3.50-02	1.07-02	4.61-03	2.38-03	1.39-03	8.78-04	5.89-04	4.15-04	3.02-04	2.27-04	1.74-04	1.37-04	1.09-04	8.82-05
20	4.09-02	1.25-02	5.38-03	2.78-03	1.62-03	1.02-03	6.88-04	4.84-04	3.52-04	2.64-04	2.03-04	1.59-04	1.27-04	1.02-04
19	4.82-02	1.48-02	6.34-03	3.28-03	1.91-03	1.21-03	8.10-04	5.69-04	4.14-04	3.11-04	2.38-04	1.87-04	1.48-04	1.19-04
18	5.75-02	1.76-02	7.55-03	3.90-03	2.27-03	1.44-03	9.63-04	6.76-04	4.92-04	3.68-04	2.82-04	2.20-04	1.74-04	1.39-04
17	6.92-02	2.12-02	9.09-03	4.70-03	2.73-03	1.73-03	1.16-03	8.12-04	5.90-04	4.41-04	3.37-04	2.62-04	2.06-04	1.61-04
16	8.45-02	2.59-02	1.11-02	5.73-03	3.33-03	2.10-03	1.41-03	9.87-04	7.17-04	5.34-04	4.07-04	3.14-04	2.42-04	1.78-04
15	1.05-01	3.21-02	1.37-02	7.09-03	4.12-03	2.60-03	1.74-03	1.22-03	8.81-04	6.55-04	4.95-04	3.75-04	2.72-04	
14	1.32-01	4.04-02	1.73-02	8.93-03	5.19-03	3.27-03	2.18-03	1.52-03	1.10-03	8.10-04	6.01-04	4.29-04		
13	1.70-01	5.20-02	2.23-02	1.15-02	6.66-03	4.19-03	2.79-03	1.94-03	1.39-03	1.01-03	7.03-04			
12	2.24-01	6.85-02	2.93-02	1.51-02	8.74-03	5.48-03	3.64-03	2.51-03	1.77-03	1.20-03				
11	3.04-01	9.29-02	3.97-02	2.04-02	1.18-02	7.36-03	4.85-03	3.29-03	2.18-03					
10	4.26-01	1.30-01	5.55-02	2.84-02	1.64-02	1.01-02	6.56-03	4.19-03						
9	6.18-01	1.88-01	8.01-02	4.09-02	2.33-02	1.42-02	8.66-03							
8	9.22-01	2.80-01	1.19-01	6.01-02	3.37-02	1.93-02								
7	1.37+00	4.14-01	1.74-01	8.68-02	4.58-02									
6	1.87+00	5.62-01	2.32-01	1.09-01										
5	2.35+00	6.93-01	2.70-01											
4	3.60+00	1.00+00												
3	8.50+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.18-06	4.32-06	3.64-06	3.10-06	2.66-06	2.30-06	2.00-06	1.75-06	1.54-06	1.36-06	1.21-06	1.08-06	9.67-07	8.70-07
45	7.12-06	5.94-06	5.01-06	4.26-06	3.65-06	3.15-06	2.74-06	2.40-06	2.11-06	1.87-06	1.66-06	1.48-06	1.33-06	1.19-06
40	1.02-05	8.49-06	7.15-06	6.08-06	5.21-06	4.50-06	3.91-06	3.42-06	3.01-06	2.66-06	2.36-06	2.10-06	1.88-06	1.69-06
35	1.53-05	1.27-05	1.07-05	9.11-06	7.80-06	6.73-06	5.85-06	5.11-06	4.49-06	3.96-06	3.51-06	3.12-06	2.78-06	2.49-06
30	2.44-05	2.03-05	1.71-05	1.45-05	1.24-05	1.07-05	9.26-06	8.07-06	7.05-06	6.18-06	5.43-06	4.75-06	4.10-06	3.34-06
29	2.71-05	2.25-05	1.90-05	1.61-05	1.37-05	1.18-05	1.02-05	8.90-06	7.76-06	6.78-06	5.90-06	5.08-06	4.12-06	
28	3.01-05	2.51-05	2.11-05	1.79-05	1.53-05	1.31-05	1.13-05	9.83-06	8.54-06	7.40-06	6.34-06	5.13-06		
27	3.37-05	2.80-05	2.35-05	1.99-05	1.70-05	1.46-05	1.26-05	1.09-05	9.37-06	7.98-06	6.43-06			
26	3.78-05	3.14-05	2.64-05	2.23-05	1.90-05	1.63-05	1.40-05	1.20-05	1.02-05	8.14-06				
25	4.26-05	3.54-05	2.96-05	2.50-05	2.13-05	1.82-05	1.55-05	1.30-05	1.04-05					
24	4.82-05	4.00-05	3.35-05	2.82-05	2.39-05	2.02-05	1.69-05	1.34-05						
23	5.48-05	4.54-05	3.79-05	3.19-05	2.68-05	2.23-05	1.75-05							
22	6.27-05	5.18-05	4.31-05	3.59-05	2.97-05	2.32-05								
21	7.21-05	5.93-05	4.90-05	4.01-05	3.12-05									
20	8.31-05	6.79-05	5.51-05	4.25-05										
19	9.61-05	7.72-05	5.89-05											
18	1.10-04	8.33-05												
17	1.20-04													

NE + TE = 1.50+04 NE = 1.00+13 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.19-32	-2.85-39	-2.71-38	8.06-39	4.60-37	1.59-36	3.19-36	5.16-36	7.55-36	1.05-35	1.40-35	1.84-35	2.37-35	3.01-35
45	7.12-32	-4.11-39	-3.82-38	8.57-39	6.33-37	2.21-36	4.45-36	7.25-36	1.07-35	1.49-35	2.01-35	2.65-35	3.45-35	4.43-35
40	1.02-31	-6.26-39	-5.65-38	7.13-39	9.05-37	3.20-36	6.50-36	1.07-35	1.58-35	2.23-35	3.05-35	4.07-35	5.36-35	6.98-35
35	1.52-31	-1.02-38	-8.90-38	-8.40-40	1.36-36	4.89-36	1.01-35	1.67-35	2.51-35	3.60-35	4.99-35	6.79-35	9.12-35	1.21-34
30	2.43-31	-1.85-38	-1.53-37	-3.11-38	2.17-36	8.06-36	1.69-35	2.86-35	4.40-35	6.44-35	9.18-35	1.29-34	1.79-34	2.49-34
29	2.69-31	-2.12-38	-1.73-37	-4.35-38	2.41-36	9.01-36	1.90-35	3.23-35	5.00-35	7.37-35	1.06-34	1.50-34	2.10-34	2.95-34
28	2.99-31	-2.44-38	-1.97-37	-5.98-38	2.68-36	1.01-35	2.15-35	3.68-35	5.72-35	8.49-35	1.23-34	1.76-34	2.50-34	3.56-34
27	3.34-31	-2.83-38	-2.25-37	-8.11-38	3.00-36	1.14-35	2.44-35	4.21-35	6.59-35	9.87-35	1.44-34	2.09-34	3.01-34	4.35-34
26	3.75-31	-3.30-38	-2.59-37	-1.09-37	3.36-36	1.30-35	2.79-35	4.85-35	7.66-35	1.16-34	1.71-34	2.51-34	3.68-34	5.41-34
25	4.23-31	-3.88-38	-3.01-37	-1.47-37	3.79-36	1.48-35	3.22-35	5.63-35	8.99-35	1.37-34	2.06-34	3.07-34	4.57-34	6.89-34
24	4.79-31	-4.60-38	-3.52-37	-1.98-37	4.29-36	1.70-35	3.74-35	6.61-35	1.07-34	1.65-34	2.51-34	3.81-34	5.82-34	9.01-34
23	5.45-31	-5.52-38	-4.15-37	-2.67-37	4.89-36	1.97-35	4.38-35	7.83-35	1.28-34	2.02-34	3.12-34	4.84-34	7.60-34	1.22-33
22	6.25-31	-6.68-38	-4.95-37	-3.61-37	5.59-36	2.31-35	5.18-35	9.40-35	1.56-34	2.50-34	3.97-34	6.32-34	1.03-33	1.72-33
21	7.20-31	-8.19-38	-5.97-37	-4.94-37	6.44-36	2.72-35	6.21-35	1.14-34	1.94-34	3.17-34	5.17-34	8.52-34	1.44-33	2.57-33
20	8.37-31	-1.02-37	-7.30-37	-6.80-37	7.46-36	3.25-35	7.55-35	1.42-34	2.45-34	4.13-34	6.96-34	1.20-33	2.15-33	4.14-33
19	9.80-31	-1.28-37	-9.05-37	-9.48-37	8.69-36	3.92-35	9.32-35	1.79-34	3.18-34	5.55-34	9.76-34	1.78-33	3.47-33	7.50-33
18	1.16-30	-1.64-37	-1.14-36	-1.34-36	1.02-35	4.81-35	1.17-34	2.32-34	4.27-34	7.76-34	1.45-33	2.86-33	6.26-33	1.63-32
17	1.38-30	-2.14-37	-1.47-36	-1.94-36	1.20-35	5.99-35	1.51-34	3.10-34	5.95-34	1.15-33	2.32-33	5.14-33	1.35-32	4.90-32
16	1.67-30	-2.86-37	-1.93-36	-2.86-36	1.42-35	7.62-35	2.00-34	4.30-34	8.76-34	1.83-33	4.15-33	1.11-32	4.05-32	3.27-31
15	2.04-30	-3.92-37	-2.61-36	-4.35-36	1.67-35	9.92-35	2.75-34	6.28-34	1.39-33	3.25-33	8.86-33	3.30-32	2.69-31	
14	2.54-30	-5.51-37	-3.64-36	-6.84-36	1.95-35	1.33-34	3.97-34	9.85-34	2.45-33	6.90-33	2.62-32	2.17-31		
13	3.21-30	-8.01-37	-5.28-36	-1.12-35	2.18-35	1.85-34	6.12-34	1.71-33	5.13-33	2.02-32	1.71-31			
12	4.15-30	-1.21-36	-8.01-36	-1.93-35	2.13-35	2.70-34	1.04-33	3.52-33	1.48-32	1.30-31				
11	5.50-30	-1.91-36	-1.28-35	-3.56-35	1.05-35	4.19-34	2.04-33	9.83-33	9.24-32					
10	7.52-30	-3.17-36	-2.20-35	-7.18-35	-3.95-35	7.00-34	5.28-33	5.84-32						
9	1.07-29	-5.55-36	-4.11-35	-1.63-34	-2.57-34	1.24-33	2.72-32							
8	1.61-29	-1.02-35	-8.43-35	-4.35-34	-1.45-33	2.42-34								
7	2.60-29	-1.85-35	-1.90-34	-1.50-33	-1.46-32									
6	4.66-29	-2.80-35	-4.58-34	-9.05-33										
5	9.98-29	-2.04-35	-1.43-33											
4	2.98-28	1.22-34												
3	2.16-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.78-35	4.72-35	5.85-35	7.22-35	8.86-35	1.09-34	1.33-34	1.62-34	1.97-34	2.40-34	2.92-34	3.57-34	4.37-34	5.36-34
45	5.63-35	7.11-35	8.93-35	1.12-34	1.39-34	1.74-34	2.16-34	2.69-34	3.36-34	4.19-34	5.26-34	6.62-34	8.39-34	1.07-33
40	9.02-35	1.16-34	1.49-34	1.90-34	2.43-34	3.11-34	3.99-34	5.14-34	6.66-34	8.69-34	1.14-33	1.53-33	2.06-33	2.84-33
35	1.61-34	2.13-34	2.82-34	3.75-34	5.00-34	6.72-34	9.10-34	1.25-33	1.74-33	2.48-33	3.62-33	5.47-33	8.62-33	1.44-32
30	3.45-34	4.82-34	6.79-34	9.68-34	1.41-33	2.09-33	3.21-33	5.13-33	8.67-33	1.58-32	3.25-32	8.00-32	2.75-31	2.10-30
29	4.16-34	5.90-34	8.47-34	1.24-33	1.85-33	2.85-33	4.57-33	7.75-33	1.42-32	2.92-32	7.20-32	2.48-31	1.89-30	
28	5.09-34	7.35-34	1.08-33	1.62-33	2.51-33	4.05-33	6.89-33	1.27-32	2.61-32	6.46-32	2.23-31	1.71-30		
27	6.34-34	9.38-34	1.42-33	2.20-33	3.57-33	6.10-33	1.13-32	2.33-32	5.77-32	2.00-31	1.53-30			
26	8.08-34	1.23-33	1.92-33	3.13-33	5.37-33	9.96-33	2.07-32	5.14-32	1.78-31	1.37-30				
25	1.06-33	1.66-33	2.72-33	4.70-33	8.75-33	1.82-32	4.55-32	1.58-31	1.22-30					
24	1.43-33	2.36-33	4.09-33	7.64-33	1.60-32	4.01-32	1.40-31	1.08-30						
23	2.02-33	3.53-33	6.64-33	1.39-32	3.51-32	1.23-31	9.54-31							
22	3.02-33	5.72-33	1.21-32	3.06-32	1.07-31	8.38-31								
21	4.89-33	1.04-32	2.64-32	9.33-32	7.31-31									
20	8.88-33	2.27-32	8.05-32	6.33-31										
19	1.93-32	6.89-32	5.44-31											
18	5.84-32	4.64-31												
17	3.92-31													

HE + TE = 2.00+04 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 9.024-13 4-3 RC = 1.713-13 4-3 EM = 7.258-25 2S RC = 2.659-13 2P RC = 6.366-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.07-03	3.93-04	2.02-04	1.21-04	7.86-05	5.43-05	3.91-05	2.92-05	2.23-05	1.75-05	1.39-05	1.13-05	9.24-06	7.67-06
45	1.45-03	5.33-04	2.75-04	1.65-04	1.08-04	7.44-05	5.37-05	4.01-05	3.07-05	2.40-05	1.92-05	1.55-05	1.27-05	1.06-05
40	2.03-03	7.52-04	3.90-04	2.34-04	1.53-04	1.06-04	7.66-05	5.72-05	4.38-05	3.43-05	2.74-05	2.22-05	1.82-05	1.51-05
35	3.01-03	1.12-03	5.79-04	3.48-04	2.28-04	1.58-04	1.14-04	8.55-05	6.55-05	5.14-05	4.10-05	3.32-05	2.73-05	2.27-05
30	4.75-03	1.76-03	9.17-04	5.52-04	3.62-04	2.51-04	1.82-04	1.36-04	1.04-04	8.19-05	6.54-05	5.30-05	4.36-05	3.62-05
29	5.25-03	1.95-03	1.01-03	6.11-04	4.01-04	2.78-04	2.02-04	1.51-04	1.16-04	9.08-05	7.25-05	5.88-05	4.83-05	4.01-05
28	5.82-03	2.16-03	1.13-03	6.79-04	4.45-04	3.09-04	2.24-04	1.68-04	1.29-04	1.01-04	8.07-05	6.54-05	5.37-05	4.46-05
27	6.48-03	2.41-03	1.25-03	7.57-04	4.97-04	3.45-04	2.50-04	1.87-04	1.44-04	1.13-04	9.01-05	7.31-05	6.00-05	4.99-05
26	7.25-03	2.69-03	1.40-03	8.47-04	5.56-04	3.87-04	2.80-04	2.10-04	1.61-04	1.27-04	1.01-04	8.20-05	6.73-05	5.59-05
25	8.14-03	3.03-03	1.58-03	9.53-04	6.26-04	4.35-04	3.16-04	2.36-04	1.82-04	1.43-04	1.14-04	9.24-05	7.59-05	6.30-05
24	9.19-03	3.42-03	1.78-03	1.08-03	7.08-04	4.93-04	3.57-04	2.68-04	2.06-04	1.62-04	1.29-04	1.05-04	8.60-05	7.14-05
23	1.04-02	3.88-03	2.02-03	1.22-03	8.05-04	5.60-04	4.07-04	3.05-04	2.34-04	1.84-04	1.47-04	1.19-04	9.79-05	8.12-05
22	1.19-02	4.43-03	2.31-03	1.40-03	9.20-04	6.41-04	4.66-04	3.49-04	2.69-04	2.11-04	1.69-04	1.37-04	1.12-04	9.29-05
21	1.36-02	5.08-03	2.66-03	1.61-03	1.06-03	7.39-04	5.37-04	4.03-04	3.10-04	2.43-04	1.94-04	1.58-04	1.29-04	1.07-04
20	1.58-02	5.88-03	3.07-03	1.86-03	1.23-03	8.57-04	6.23-04	4.68-04	3.60-04	2.83-04	2.26-04	1.83-04	1.50-04	1.24-04
19	1.84-02	6.84-03	3.58-03	2.17-03	1.43-03	1.00-03	7.29-04	5.48-04	4.22-04	3.31-04	2.65-04	2.14-04	1.75-04	1.44-04
18	2.15-02	8.04-03	4.22-03	2.56-03	1.69-03	1.18-03	8.61-04	6.47-04	4.98-04	3.92-04	3.13-04	2.53-04	2.05-04	1.67-04
17	2.55-02	9.53-03	5.01-03	3.04-03	2.01-03	1.41-03	1.03-03	7.72-04	5.95-04	4.68-04	3.73-04	3.00-04	2.42-04	1.92-04
16	3.05-02	1.14-02	6.01-03	3.66-03	2.42-03	1.70-03	1.24-03	9.33-04	7.19-04	5.65-04	4.49-04	3.58-04	2.82-04	2.25-04
15	3.70-02	1.39-02	7.30-03	4.46-03	2.96-03	2.08-03	1.52-03	1.14-03	8.80-04	6.89-04	5.44-04	4.24-04	3.07-04	
14	4.54-02	1.70-02	9.00-03	5.51-03	3.66-03	2.57-03	1.88-03	1.42-03	1.09-03	8.50-04	6.57-04	4.72-04		
13	5.66-02	2.13-02	1.13-02	6.92-03	4.61-03	3.24-03	2.38-03	1.79-03	1.37-03	1.05-03	7.48-04			
12	7.19-02	2.71-02	1.44-02	8.87-03	5.93-03	4.19-03	3.07-03	2.31-03	1.74-03	1.23-03				
11	9.34-02	3.53-02	1.88-02	1.16-02	7.82-03	5.54-03	4.06-03	3.01-03	2.11-03					
10	1.24-01	4.72-02	2.53-02	1.58-02	1.06-02	7.54-03	5.47-03	3.79-03						
9	1.71-01	6.52-02	3.53-02	2.21-02	1.50-02	1.06-02	7.25-03							
8	2.46-01	9.42-02	5.15-02	3.26-02	2.21-02	1.49-02								
7	3.72-01	1.44-01	8.00-02	5.11-02	3.35-02									
6	6.07-01	2.39-01	1.35-01	8.51-02										
5	1.11+00	4.46-01	2.56-01											
4	2.42+00	1.00+00												
3	7.37+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.44-06	5.45-06	4.66-06	4.01-06	3.47-06	3.03-06	2.65-06	2.34-06	2.07-06	1.84-06	1.64-06	1.47-06	1.32-06	1.19-06
45	8.88-06	7.52-06	6.42-06	5.52-06	4.78-06	4.17-06	3.65-06	3.22-06	2.84-06	2.53-06	2.25-06	2.01-06	1.81-06	1.63-06
40	1.27-05	1.07-05	9.18-06	7.90-06	6.84-06	5.95-06	5.21-06	4.59-06	4.05-06	3.59-06	3.20-06	2.86-06	2.56-06	2.29-06
35	1.90-05	1.61-05	1.38-05	1.18-05	1.02-05	8.90-06	7.78-06	6.83-06	6.02-06	5.33-06	4.72-06	4.19-06	3.73-06	3.32-06
30	3.04-05	2.57-05	2.19-05	1.88-05	1.62-05	1.41-05	1.23-05	1.07-05	9.36-06	8.18-06	7.12-06	6.14-06	5.18-06	4.05-06
29	3.37-05	2.85-05	2.43-05	2.08-05	1.80-05	1.56-05	1.35-05	1.18-05	1.02-05	8.89-06	7.64-06	6.42-06	5.00-06	
28	3.74-05	3.17-05	2.70-05	2.31-05	1.99-05	1.72-05	1.49-05	1.29-05	1.12-05	9.58-06	8.02-06	6.23-06		
27	4.18-05	3.54-05	3.01-05	2.58-05	2.22-05	1.91-05	1.65-05	1.42-05	1.21-05	1.01-05	7.81-06			
26	4.69-05	3.96-05	3.37-05	2.88-05	2.47-05	2.12-05	1.82-05	1.55-05	1.29-05	9.88-06				
25	5.28-05	4.46-05	3.79-05	3.23-05	2.76-05	2.35-05	1.99-05	1.65-05	1.26-05					
24	5.97-05	5.04-05	4.27-05	3.63-05	3.08-05	2.59-05	2.14-05	1.63-05						
23	6.79-05	5.71-05	4.83-05	4.07-05	3.42-05	2.80-05	2.12-05							
22	7.76-05	6.51-05	5.46-05	4.56-05	3.72-05	2.80-05								
21	8.90-05	7.42-05	6.16-05	5.00-05	3.75-05									
20	1.02-04	8.44-05	6.82-05	5.09-05										
19	1.18-04	9.46-05	7.01-05											
18	1.33-04	9.83-05												
17	1.41-04													

HE + TE = 2.00+04 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.06-38	1.47-38	2.62-38	4.66-38	7.88-38	1.25-37	1.90-37	2.74-37	3.82-37	5.16-37	6.77-37	8.66-37	1.08-36
45	0.00+00	1.45-38	2.04-38	3.67-38	6.61-38	1.12-37	1.79-37	2.70-37	3.88-37	5.35-37	7.11-37	9.13-37	1.13-36	1.36-36
40	0.00+00	2.08-38	2.93-38	5.35-38	9.75-38	1.67-37	2.69-37	4.08-37	5.88-37	8.11-37	1.07-36	1.37-36	1.68-36	1.96-36
35	0.00+00	3.12-38	4.45-38	8.24-38	1.52-37	2.65-37	4.31-37	6.62-37	9.66-37	1.35-36	1.80-36	2.31-36	2.82-36	3.24-36
30	0.00+00	5.00-38	7.24-38	1.37-37	2.58-37	4.57-37	7.60-37	1.19-36	1.78-36	2.53-36	3.45-36	4.48-36	5.49-36	6.18-36
29	0.00+00	5.55-38	8.07-38	1.53-37	2.90-37	5.17-37	8.64-37	1.36-36	2.04-36	2.92-36	4.00-36	5.23-36	6.41-36	7.15-36
28	0.00+00	6.19-38	9.02-38	1.72-37	3.27-37	5.87-37	9.87-37	1.57-36	2.36-36	3.41-36	4.69-36	6.15-36	7.54-36	8.30-36
27	0.00+00	6.92-38	1.01-37	1.94-37	3.72-37	6.72-37	1.14-36	1.82-36	2.76-36	4.00-36	5.55-36	7.31-36	8.95-36	9.67-36
26	0.00+00	7.78-38	1.15-37	2.20-37	4.25-37	7.73-37	1.32-36	2.12-36	3.25-36	4.75-36	6.63-36	8.77-36	1.07-35	1.12-35
25	0.00+00	8.79-38	1.30-37	2.52-37	4.89-37	8.96-37	1.54-36	2.50-36	3.86-36	5.70-36	8.02-36	1.07-35	1.24-35	1.29-35
24	0.00+00	9.98-38	1.48-37	2.90-37	5.67-37	1.05-36	1.82-36	2.98-36	4.64-36	6.92-36	9.83-36	1.31-35	1.57-35	1.44-35
23	0.00+00	1.14-37	1.71-37	3.36-37	6.63-37	1.24-36	2.16-36	3.58-36	5.66-36	8.53-36	1.22-35	1.53-35	1.91-35	1.48-35
22	0.00+00	1.31-37	1.97-37	3.92-37	7.81-37	1.47-36	2.61-36	4.37-36	6.99-36	1.07-35	1.55-35	2.06-35	2.30-35	1.15-35
21	0.00+00	1.52-37	2.30-37	4.61-37	9.30-37	1.77-36	3.18-36	5.42-36	8.80-36	1.36-35	1.99-35	2.64-35	2.66-35	-3.51-36
20	0.00+00	1.77-37	2.71-37	5.49-37	1.12-36	2.17-36	3.95-36	6.84-36	1.13-35	1.78-35	2.63-35	3.39-35	2.67-35	-5.68-35
19	0.00+00	2.08-37	3.22-37	6.61-37	1.37-36	2.69-36	4.99-36	8.81-36	1.49-35	2.39-35	3.54-35	4.29-35	1.00-35	-2.53-34
18	0.00+00	2.47-37	3.86-37	8.05-37	1.70-36	3.40-36	6.45-36	1.16-35	2.01-35	3.30-35	4.88-35	4.91-35	-8.17-35	-1.13-33
17	0.00+00	2.97-37	4.70-37	9.97-37	2.14-36	4.39-36	8.55-36	1.59-35	2.83-35	4.75-35	6.75-35	2.64-35	-5.70-34	-6.91-33
16	0.00+00	3.61-37	5.80-37	1.26-36	2.77-36	5.83-36	1.17-35	2.26-35	4.17-35	7.11-35	8.58-35	-1.95-34	-4.17-33	-1.05-31
15	0.00+00	4.46-37	7.29-37	1.62-36	3.67-36	8.00-36	1.67-35	3.38-35	6.52-35	1.10-34	3.45-35	-2.22-33	-7.07-32	
14	0.00+00	5.59-37	9.35-37	2.14-36	5.03-36	1.14-35	2.52-35	5.40-35	1.09-34	1.55-34	-9.06-34	-4.44-32		
13	0.00+00	7.16-37	1.23-36	2.92-36	7.19-36	1.73-35	4.09-35	9.50-35	1.97-34	-1.09-34	-2.52-32			
12	0.00+00	9.39-37	1.66-36	4.15-36	1.09-35	2.83-35	7.39-35	1.91-34	3.03-34	-1.21-32				
11	0.00+00	1.27-36	2.35-36	6.23-36	1.78-35	5.18-35	1.57-34	4.50-34	-4.06-33					
10	0.00+00	1.78-36	3.48-36	1.01-35	3.25-35	1.13-34	4.33-34	2.00-34						
9	0.00+00	2.62-36	5.54-36	1.83-35	7.15-35	3.36-34	1.88-33							
8	0.00+00	4.11-36	9.79-36	3.97-35	2.19-34	2.03-33								
7	0.00+00	7.12-36	2.05-35	1.21-34	1.49-33									
6	0.00+00	1.44-35	5.88-35	8.37-34										
5	0.00+00	3.84-35	3.72-34											
4	0.00+00	2.02-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.32-36	1.58-36	1.84-36	2.08-36	2.27-36	2.36-36	2.29-36	1.94-36	1.18-36	-2.06-37	-2.51-36	-6.18-36	-1.17-35	-2.00-35
45	1.57-36	1.73-36	1.78-36	1.64-36	1.17-36	2.08-37	-1.54-36	-4.46-36	-9.14-36	-1.65-35	-2.77-35	-4.47-35	-7.05-35	-1.09-34
40	2.15-36	2.16-36	1.82-36	8.70-37	-1.08-36	-4.66-36	-1.08-35	-2.11-35	-3.80-35	-6.53-35	-1.09-34	-1.81-34	-2.97-34	-4.89-34
35	3.40-36	2.99-36	1.49-36	-2.00-36	-9.06-36	-2.24-35	-4.67-35	-9.04-35	-1.69-34	-3.12-34	-5.77-34	-1.08-33	-2.09-33	-4.23-33
30	5.89-36	3.33-36	-4.13-36	-2.18-35	-6.04-35	-1.43-34	-3.21-34	-7.14-34	-1.63-33	-3.93-33	-1.05-32	-3.33-32	-1.47-31	-1.45-30
29	6.54-36	2.69-36	-8.36-36	-3.50-35	-9.53-35	-2.30-34	-5.39-34	-1.28-33	-3.18-33	-8.72-33	-2.84-32	-1.29-31	-1.30-30	
28	7.13-36	1.19-36	-1.58-35	-5.77-35	-1.57-34	-3.93-34	-9.75-34	-2.52-33	-7.14-33	-2.40-32	-1.12-31	-1.16-30		
27	7.51-36	-2.00-36	-2.93-35	-9.92-35	-2.74-34	-7.24-34	-1.96-33	-5.74-33	-1.99-32	-9.57-32	-1.63-30			
26	7.28-36	-8.60-36	-5.49-35	-1.80-34	-5.17-34	-1.48-33	-4.53-33	-1.63-32	-8.12-32	-9.06-31				
25	5.55-36	-2.24-35	-1.07-34	-3.50-34	-1.08-33	-3.49-33	-1.31-32	-6.79-32	-7.89-31					
24	2.13-37	-5.26-35	-2.21-34	-7.56-34	-2.61-33	-1.03-32	-5.59-32	-6.81-31						
23	-1.40-35	-1.23-34	-5.00-34	-1.89-33	-7.93-33	-4.53-32	-5.80-31							
22	-5.19-35	-3.04-34	-1.31-33	-5.92-33	-3.59-32	-4.87-31								
21	-1.59-34	-8.49-34	-4.27-33	-2.78-32	-4.02-31									
20	-5.04-34	-2.94-33	-2.09-32	-3.26-31										
19	-1.90-33	-1.52-32	-2.58-31											
18	-1.05-32	-1.98-31												
17	-1.47-31													

HE + TE = 2.00+04 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 9.030-13 4-3 RC = 1.711-13 4-3 EM = 7.250-25 2S RC = 2.661-13 2P RC = 6.369-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.26-03	4.42-04	2.18-04	1.26-04	8.02-05	5.45-05	3.88-05	2.87-05	2.18-05	1.70-05	1.35-05	1.09-05	8.90-06	7.37-06
45	1.59-03	5.70-04	2.87-04	1.69-04	1.09-04	7.45-05	5.34-05	3.96-05	3.02-05	2.36-05	1.88-05	1.52-05	1.24-05	1.03-05
40	2.14-03	7.78-04	3.98-04	2.37-04	1.54-04	1.06-04	7.63-05	5.68-05	4.34-05	3.39-05	2.70-05	2.19-05	1.79-05	1.49-05
35	3.09-03	1.13-03	5.85-04	3.50-04	2.29-04	1.58-04	1.14-04	8.52-05	6.52-05	5.11-05	4.07-05	3.30-05	2.71-05	2.25-05
30	4.80-03	1.77-03	9.21-04	5.54-04	3.63-04	2.51-04	1.82-04	1.36-04	1.04-04	8.16-05	6.51-05	5.28-05	4.33-05	3.60-05
29	5.29-03	1.96-03	1.02-03	6.13-04	4.01-04	2.78-04	2.01-04	1.51-04	1.15-04	9.05-05	7.22-05	5.85-05	4.80-05	3.99-05
28	5.86-03	2.17-03	1.13-03	6.80-04	4.46-04	3.09-04	2.24-04	1.67-04	1.28-04	1.01-04	8.04-05	6.51-05	5.34-05	4.44-05
27	6.52-03	2.42-03	1.26-03	7.58-04	4.97-04	3.45-04	2.50-04	1.87-04	1.43-04	1.12-04	8.98-05	7.27-05	5.97-05	4.96-05
26	7.29-03	2.71-03	1.41-03	8.49-04	5.57-04	3.87-04	2.80-04	2.10-04	1.61-04	1.26-04	1.01-04	8.16-05	6.70-05	5.56-05
25	8.18-03	3.04-03	1.58-03	9.55-04	6.27-04	4.36-04	3.16-04	2.36-04	1.81-04	1.42-04	1.14-04	9.20-05	7.55-05	6.26-05
24	9.23-03	3.43-03	1.79-03	1.08-03	7.09-04	4.93-04	3.57-04	2.67-04	2.05-04	1.61-04	1.29-04	1.04-04	8.55-05	7.09-05
23	1.05-02	3.89-03	2.03-03	1.23-03	8.06-04	5.61-04	4.07-04	3.04-04	2.34-04	1.84-04	1.47-04	1.19-04	9.74-05	8.07-05
22	1.19-02	4.44-03	2.32-03	1.40-03	9.21-04	6.41-04	4.65-04	3.49-04	2.68-04	2.10-04	1.68-04	1.36-04	1.12-04	9.24-05
21	1.37-02	5.10-03	2.66-03	1.61-03	1.06-03	7.39-04	5.36-04	4.02-04	3.09-04	2.43-04	1.94-04	1.57-04	1.29-04	1.06-04
20	1.58-02	5.89-03	3.08-03	1.87-03	1.23-03	8.57-04	6.23-04	4.67-04	3.59-04	2.82-04	2.25-04	1.82-04	1.49-04	1.23-04
19	1.84-02	6.86-03	3.59-03	2.18-03	1.44-03	1.00-03	7.29-04	5.47-04	4.21-04	3.30-04	2.64-04	2.13-04	1.74-04	1.43-04
18	2.16-02	8.06-03	4.22-03	2.56-03	1.69-03	1.18-03	8.60-04	6.46-04	4.97-04	3.90-04	3.11-04	2.51-04	2.04-04	1.66-04
17	2.56-02	9.55-03	5.02-03	3.05-03	2.02-03	1.41-03	1.03-03	7.71-04	5.94-04	4.66-04	3.71-04	2.98-04	2.40-04	1.91-04
16	3.06-02	1.14-02	6.02-03	3.66-03	2.43-03	1.70-03	1.24-03	9.31-04	7.17-04	5.62-04	4.46-04	3.56-04	2.81-04	2.08-04
15	3.71-02	1.39-02	7.31-03	4.46-03	2.96-03	2.07-03	1.51-03	1.14-03	8.77-04	6.86-04	5.41-04	4.23-04	3.10-04	
14	4.55-02	1.71-02	9.01-03	5.51-03	3.66-03	2.57-03	1.88-03	1.41-03	1.09-03	8.45-04	6.54-04	4.76-04		
13	5.68-02	2.13-02	1.13-02	6.92-03	4.61-03	3.25-03	2.38-03	1.79-03	1.37-03	1.04-03	7.52-04			
12	7.21-02	2.71-02	1.44-02	8.88-03	5.93-03	4.19-03	3.06-03	2.30-03	1.73-03	1.23-03				
11	9.36-02	3.53-02	1.89-02	1.17-02	7.82-03	5.53-03	4.04-03	2.99-03	2.11-03					
10	1.25-01	4.73-02	2.54-02	1.58-02	1.06-02	7.52-03	5.45-03	3.79-03						
9	1.72-01	6.54-02	3.54-02	2.21-02	1.50-02	1.06-02	7.24-03							
8	2.46-01	9.44-02	5.16-02	3.26-02	2.21-02	1.49-02								
7	3.73-01	1.44-01	8.01-02	5.11-02	3.35-02									
6	6.09-01	2.39-01	1.35-01	8.50-02										
5	1.11+00	4.47-01	2.55-01											
4	2.42+00	1.00+00												
3	7.38+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.18-06	5.23-06	4.46-06	3.84-06	3.32-06	2.90-06	2.54-06	2.24-06	1.98-06	1.76-06	1.57-06	1.41-06	1.27-06	1.14-06
45	8.65-06	7.32-06	6.25-06	5.38-06	4.66-06	4.06-06	3.55-06	3.13-06	2.77-06	2.46-06	2.20-06	1.97-06	1.77-06	1.59-06
40	1.25-05	1.06-05	9.03-06	7.77-06	6.72-06	5.85-06	5.13-06	4.51-06	3.99-06	3.54-06	3.15-06	2.82-06	2.53-06	2.27-06
35	1.88-05	1.59-05	1.36-05	1.17-05	1.01-05	8.80-06	7.70-06	6.76-06	5.96-06	5.28-06	4.69-06	4.17-06	3.72-06	3.32-06
30	3.02-05	2.55-05	2.17-05	1.87-05	1.61-05	1.40-05	1.22-05	1.06-05	9.33-06	8.18-06	7.16-06	6.23-06	5.32-06	4.27-06
29	3.34-05	2.83-05	2.41-05	2.07-05	1.78-05	1.54-05	1.34-05	1.17-05	1.02-05	8.92-06	7.73-06	6.59-06	5.26-06	
28	3.72-05	3.14-05	2.68-05	2.30-05	1.98-05	1.71-05	1.49-05	1.29-05	1.12-05	9.68-06	8.21-06	6.53-06		
27	4.15-05	3.51-05	2.99-05	2.56-05	2.20-05	1.90-05	1.64-05	1.42-05	1.22-05	1.03-05	8.17-06			
26	4.66-05	3.93-05	3.35-05	2.86-05	2.46-05	2.11-05	1.82-05	1.56-05	1.31-05	1.03-05				
25	5.25-05	4.43-05	3.76-05	3.21-05	2.74-05	2.35-05	2.00-05	1.67-05	1.31-05					
24	5.93-05	5.00-05	4.24-05	3.61-05	3.07-05	2.60-05	2.17-05	1.69-05						
23	6.75-05	5.68-05	4.80-05	4.06-05	3.42-05	2.83-05	2.20-05							
22	7.71-05	6.46-05	5.43-05	4.55-05	3.75-05	2.89-05								
21	8.84-05	7.38-05	6.14-05	5.03-05	3.86-05									
20	1.02-04	8.41-05	6.85-05	5.22-05										
19	1.17-04	9.47-05	7.17-05											
18	1.33-04	1.00-04												
17	1.43-04													

HE + TE = 2.00+04 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	1.06-38	1.30-38	2.03-38	3.43-38	5.97-38	1.05-37	1.83-37	3.11-37	5.16-37	8.30-37	1.30-36	1.9_-36	2.96-36
45	0.00+00	1.47-38	1.96-38	3.34-38	5.86-38	1.01-37	1.69-37	2.75-37	4.35-37	6.70-37	1.01-36	1.49-36	2.17-36	3.10-36
40	0.00+00	2.11-38	2.92-38	5.20-38	9.36-38	1.61-37	2.65-37	4.15-37	6.27-37	9.19-37	1.31-36	1.83-36	2.52-36	3.40-36
35	0.00+00	3.15-38	4.46-38	8.16-38	1.50-37	2.61-37	4.27-37	6.63-37	9.84-37	1.41-36	1.95-36	2.61-36	3.41-36	4.33-36
30	0.00+00	5.02-38	7.25-38	1.36-37	2.55-37	4.51-37	7.49-37	1.18-36	1.76-36	2.52-36	3.47-36	4.60-36	5.84-36	7.02-36
29	0.00+00	5.57-38	8.07-38	1.52-37	2.87-37	5.10-37	8.51-37	1.34-36	2.01-36	2.90-36	4.00-36	5.30-36	6.71-36	7.98-36
28	0.00+00	6.20-38	9.02-38	1.71-37	3.24-37	5.79-37	9.72-37	1.54-36	2.33-36	3.36-36	4.66-36	6.19-36	7.81-36	9.17-36
27	0.00+00	6.94-38	1.01-37	1.93-37	3.68-37	6.63-37	1.12-36	1.78-36	2.71-36	3.93-36	5.48-36	7.30-36	9.19-36	1.06-35
26	0.00+00	7.80-38	1.14-37	2.19-37	4.21-37	7.63-37	1.30-36	2.08-36	3.18-36	4.65-36	6.52-36	8.72-36	1.10-35	1.24-35
25	0.00+00	8.80-38	1.30-37	2.51-37	4.85-37	8.84-37	1.51-36	2.45-36	3.78-36	5.57-36	7.87-36	1.06-35	1.32-35	1.46-35
24	0.00+00	9.99-38	1.48-37	2.88-37	5.62-37	1.03-36	1.79-36	2.92-36	4.54-36	6.76-36	9.62-36	1.30-35	1.61-35	1.70-35
23	0.00+00	1.14-37	1.70-37	3.34-37	6.56-37	1.22-36	2.13-36	3.51-36	5.53-36	8.32-36	1.20-35	1.62-35	1.99-35	1.93-35
22	0.00+00	1.31-37	1.97-37	3.90-37	7.74-37	1.45-36	2.56-36	4.28-36	6.83-36	1.04-35	1.51-35	2.06-35	2.47-35	2.01 35
21	0.00+00	1.52-37	2.30-37	4.59-37	9.22-37	1.75-36	3.13-36	5.31-36	8.59-36	1.33-35	1.96-35	2.67-35	3.04-35	1.52-35
20	0.00+00	1.77-37	2.70-37	5.46-37	1.11-36	2.14-36	3.89-36	6.70-36	1.10-35	1.74-35	2.60-35	3.51-35	3.58-35	-1.10-35
19	0.00+00	2.08-37	3.21-37	6.57-37	1.36-36	2.66-36	4.91-36	8.63-36	1.45-35	2.34-35	3.54-35	4.65-35	3.39-35	-1.20-34
18	0.00+00	2.47-37	3.86-37	8.01-37	1.68-36	3.36-36	6.34-36	1.14-35	1.97-35	3.25-35	4.96-35	6.01-35	-7.68-36	-6.21-34
17	0.00+00	2.97-37	4.69-37	9.92-37	2.12-36	4.34-36	8.41-36	1.56-35	2.78-35	4.72-35	7.15-35	6.38-35	-2.74-34	-3.89-33
16	0.00+00	3.62-37	5.79-37	1.25-36	2.74-36	5.76-36	1.15-35	2.22-35	4.11-35	7.18-35	1.02-34	-3.52-35	-2.32-33	-5.60-32
15	0.00+00	4.46-37	7.28-37	1.61-36	3.64-36	7.90-36	1.65-35	3.32-35	6.47-35	1.15-34	1.13-34	-1.15-33	-3.87-32	
14	0.00+00	5.60-37	9.33-37	2.13-36	4.98-36	1.13-35	2.48-35	5.33-35	1.10-34	1.88-34	-3.45-34	-2.48-32		
13	0.00+00	7.17-37	1.23-36	2.90-36	7.12-36	1.71-35	4.04-35	9.43-35	2.08-34	1.56-34	-1.41-32			
12	0.00+00	9.40-37	1.66-36	4.12-36	1.08-35	2.80-35	7.30-35	1.92-34	4.10-34	-6.44-33				
11	0.00+00	1.27-36	2.34-36	6.19-36	1.76-35	5.12-35	1.56-34	4.83-34	-1.52-33					
10	0.00+00	1.78-36	3.47-36	1.00-35	3.22-35	1.12-34	4.38-34	1.16-33						
9	0.00+00	2.62-36	5.53-36	1.82-35	7.08-35	3.34-34	2.15-33							
8	0.00+00	4.12-36	9.76-36	3.94-35	2.17-34	2.07-33								
7	0.00+00	7.13-36	2.04-35	1.20-34	1.49-33									
6	0.00+00	1.44-35	5.86-35	8.30-34										
5	0.00+00	3.84-35	3.70-34											
4	0.00+00	2.02-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.32-36	6.20-36	8.76-36	1.22-35	1.68-35	2.29-35	3.09-35	4.14-35	5.52-35	7.32-35	9.66-35	1.27-34	1.67-34	2.20-34
45	4.36-36	6.07-36	8.36-36	1.14-35	1.54-35	2.08-35	2.78-35	3.71-35	4.93-35	6.53-35	8.66-35	1.15-34	1.53-34	2.03-34
40	4.53-36	5.97-36	7.79-36	1.01-35	1.29-35	1.64-35	2.07-35	2.60-35	3.24-35	3.99-35	4.86-35	5.82-35	6.79-35	7.56-35
35	5.34-36	6.36-36	7.21-36	7.62-36	7.04-36	4.51-36	-1.68-36	-1.46-35	-3.99-35	-8.84-35	-1.81-34	-3.60-34	-7.20-34	-1.48-33
30	7.77-36	7.34-36	4.26-36	-4.44-36	-2.47-35	-6.86-35	-1.63-34	-3.66-34	-8.27-34	-1.95-33	-5.02-33	-1.52-32	-6.36-32	-5.88-31
29	8.56-36	7.33-36	1.95-36	-1.24-35	-4.58-35	-1.21-34	-2.88-34	-6.76-34	-1.64-33	-4.33-33	-1.34-32	-5.73-32	-5.41-31	
28	9.45-36	6.90-36	-2.25-36	-2.62-35	-8.32-35	-2.17-34	-5.36-34	-1.35-33	-3.67-33	-1.17-32	-5.10-32	-4.94-31		
27	1.04-35	5.58-36	-1.01-35	-5.13-35	-1.54-34	-4.09-34	-1.08-33	-3.05-33	-9.99-33	-4.48-32	-4.46-31			
26	1.11-35	2.35-36	-2.53-35	-1.00-34	-2.97-34	-8.38-34	-2.47-33	-8.40-33	-3.89-32	-3.98-31				
25	1.13-35	-5.10-36	-5.64-35	-2.03-34	-6.24-34	-1.95-33	-6.92-33	-3.32-32	-3.52-31					
24	9.57-36	-2.22-35	-1.25-34	-4.42-34	-1.49-33	-5.58-33	-2.80-32	-3.08-31						
23	2.97-36	-6.34-35	-2.92-34	-1.10-33	-4.38-33	-2.31-32	-2.67-31							
22	-1.72-35	-1.71-34	-7.63-34	-3.33-33	-1.87-32	-2.27-31								
21	-7.81-35	-4.92-34	-2.44-33	-1.48-32	-1.91-31									
20	-2.79-34	-1.69-33	-1.13-32	-1.58-31										
19	-1.09-33	-8.39-33	-1.28-31											
18	-5.91-33	-1.00-31												
17	-7.65-32													

HE + 1E = 2.00+04 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 9.040-13 4-3 RC = 1.701-13 4-3 LM = 7.210-25 2S RC = 2.669-13 2P RC = 6.371-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.85-03	5.96-04	2.69-04	1.45-04	8.75-05	5.71-05	3.94-05	2.84-05	2.11-05	1.62-05	1.27-05	1.01-05	8.19-06	6.74-06
45	2.22-03	7.36-04	3.41-04	1.88-04	1.15-04	7.63-05	5.32-05	3.87-05	2.90-05	2.24-05	1.76-05	1.41-05	1.15-05	9.47-06
40	2.72-03	9.34-04	4.48-04	2.54-04	1.59-04	1.07-04	7.54-05	5.53-05	4.18-05	3.24-05	2.56-05	2.06-05	1.68-05	1.39-05
35	3.56-03	1.26-03	6.25-04	3.64-04	2.32-04	1.58-04	1.13-04	8.36-05	6.36-05	4.95-05	3.93-05	3.17-05	2.60-05	2.15-05
30	5.15-03	1.86-03	9.50-04	5.64-04	3.66-04	2.52-04	1.81-04	1.35-04	1.03-04	8.03-05	6.38-05	5.16-05	4.22-05	3.50-05
29	5.62-03	2.04-03	1.05-03	6.22-04	4.04-04	2.79-04	2.01-04	1.49-04	1.14-04	8.92-05	7.09-05	5.73-05	4.70-05	3.89-05
28	6.17-03	2.25-03	1.16-03	6.89-04	4.49-04	3.10-04	2.23-04	1.66-04	1.27-04	9.94-05	7.91-05	6.39-05	5.24-05	4.34-05
27	6.81-03	2.49-03	1.28-03	7.67-04	5.00-04	3.46-04	2.49-04	1.86-04	1.42-04	1.11-04	8.85-05	7.15-05	5.86-05	4.85-05
26	7.55-03	2.77-03	1.43-03	8.58-04	5.60-04	3.88-04	2.80-04	2.09-04	1.60-04	1.25-04	9.94-05	8.04-05	6.58-05	5.45-05
25	8.43-03	3.10-03	1.61-03	9.64-04	6.30-04	4.36-04	3.15-04	2.35-04	1.80-04	1.41-04	1.12-04	9.07-05	7.42-05	6.14-05
24	9.46-03	3.49-03	1.81-03	1.09-03	7.12-04	4.94-04	3.57-04	2.66-04	2.04-04	1.60-04	1.27-04	1.03-04	8.41-05	6.96-05
23	1.07-02	3.95-03	2.05-03	1.24-03	8.10-04	5.62-04	4.06-04	3.03-04	2.33-04	1.82-04	1.45-04	1.17-04	9.58-05	7.92-05
22	1.21-02	4.50-03	2.34-03	1.41-03	9.26-04	6.43-04	4.65-04	3.48-04	2.67-04	2.09-04	1.66-04	1.34-04	1.10-04	9.06-05
21	1.39-02	5.16-03	2.69-03	1.62-03	1.07-03	7.40-04	5.36-04	4.01-04	3.07-04	2.41-04	1.92-04	1.55-04	1.26-04	1.04-04
20	1.60-02	5.96-03	3.11-03	1.88-03	1.23-03	8.59-04	6.22-04	4.66-04	3.57-04	2.80-04	2.23-04	1.80-04	1.46-04	1.20-04
19	1.86-02	6.93-03	3.62-03	2.19-03	1.44-03	1.00-03	7.28-04	5.45-04	4.18-04	3.27-04	2.60-04	2.10-04	1.71-04	1.40-04
18	2.18-02	8.14-03	4.26-03	2.58-03	1.70-03	1.18-03	8.60-04	6.44-04	4.94-04	3.87-04	3.07-04	2.47-04	2.00-04	1.62-04
17	2.58-02	9.64-03	5.05-03	3.07-03	2.02-03	1.41-03	1.03-03	7.68-04	5.90-04	4.61-04	3.66-04	2.93-04	2.35-04	1.87-04
16	3.09-02	1.16-02	6.06-03	3.69-03	2.44-03	1.70-03	1.24-03	9.27-04	7.11-04	5.56-04	4.39-04	3.49-04	2.75-04	2.04-04
15	3.74-02	1.40-02	7.37-03	4.49-03	2.97-03	2.08-03	1.51-03	1.13-03	8.69-04	6.76-04	5.31-04	4.13-04	3.04-04	
14	4.59-02	1.72-02	9.08-03	5.54-03	3.67-03	2.57-03	1.88-03	1.41-03	1.08-03	8.32-04	6.40-04	4.66-04		
13	5.73-02	2.15-02	1.14-02	6.96-03	4.63-03	3.25-03	2.37-03	1.77-03	1.35-03	1.02-03	7.36-04			
12	7.27-02	2.74-02	1.45-02	8.92-03	5.95-03	4.18-03	3.05-03	2.27-03	1.70-03	1.21-03				
11	9.44-02	3.56-02	1.90-02	1.17-02	7.83-03	5.52-03	4.01-03	2.95-03	2.07-03					
10	1.26-01	4.76-02	2.55-02	1.58-02	1.06-02	7.49-03	5.39-03	3.72-03						
9	1.73-01	6.59-02	3.56-02	2.22-02	1.50-02	1.05-02	7.12-03							
8	2.48-01	9.51-02	5.19-02	3.26-02	2.20-02	1.47-02								
7	3.76-01	1.45-01	8.04-02	5.10-02	3.31-02									
6	6.14-01	2.41-01	1.36-01	8.43-02										
5	1.12+00	4.49-01	2.54-01											
4	2.44+00	1.00+00												
3	7.42+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.61-06	4.72-06	4.01-06	3.43-06	2.96-06	2.57-06	2.25-06	1.98-06	1.75-06	1.56-06	1.39-06	1.24-06	1.12-06	1.01-06
45	7.91-06	6.67-06	5.67-06	4.87-06	4.21-06	3.66-06	3.21-06	2.82-06	2.50-06	2.22-06	1.98-06	1.77-06	1.60-06	1.44-06
40	1.17-05	9.85-06	8.39-06	7.21-06	6.24-06	5.43-06	4.75-06	4.18-06	3.70-06	3.29-06	2.93-06	2.62-06	2.35-06	2.12-06
35	1.80-05	1.52-05	1.30-05	1.11-05	9.63-06	8.37-06	7.32-06	6.43-06	5.68-06	5.03-06	4.47-06	3.98-06	3.56-06	3.18-06
30	2.93-05	2.47-05	2.11-05	1.81-05	1.56-05	1.35-05	1.18-05	1.03-05	9.01-06	7.91-06	6.94-06	6.06-06	5.21-06	4.21-06
29	3.26-05	2.75-05	2.34-05	2.00-05	1.73-05	1.50-05	1.30-05	1.13-05	9.91-06	8.65-06	7.52-06	6.44-06	5.19-06	
28	3.63-05	3.06-05	2.60-05	2.23-05	1.92-05	1.66-05	1.44-05	1.25-05	1.09-05	9.42-06	8.03-06	6.44-06		
27	4.06-05	3.42-05	2.91-05	2.49-05	2.14-05	1.84-05	1.59-05	1.38-05	1.19-05	1.01-05	8.06-06			
26	4.55-05	3.84-05	3.26-05	2.78-05	2.39-05	2.05-05	1.77-05	1.51-05	1.28-05	1.02-05				
25	5.13-05	4.32-05	3.66-05	3.12-05	2.67-05	2.28-05	1.95-05	1.64-05	1.29-05					
24	5.81-05	4.88-05	4.13-05	3.51-05	2.99-05	2.53-05	2.12-05	1.67-05						
23	6.60-05	5.54-05	4.67-05	3.95-05	3.33-05	2.77-05	2.16-05							
22	7.54-05	6.31-05	5.29-05	4.43-05	3.66-05	2.85-05								
21	8.64-05	7.20-05	5.98-05	4.91-05	3.79-05									
20	9.94-05	8.20-05	6.68-05	5.13-05										
19	1.14-04	9.24-05	7.04-05											
18	1.30-04	9.83-05												
17	1.40-04													

HE + 1E = 2.00+04 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	8.13-39	2.65-39	-7.73-39	-2.38-38	-3.93-38	-3.84-38	7.98-39	1.47-37	4.50-37	1.02-36	1.99-36	3.56-36	5.97-36
45	0.00+00	1.27-38	9.65-39	5.48-39	1.31-39	6.58-39	4.21-38	1.44-37	3.71-37	8.08-37	1.58-36	2.85-36	4.87-36	7.95-36
40	0.00+00	2.00-38	2.17-38	2.91-38	4.61-38	8.54-38	1.72-37	3.49-37	6.79-37	1.26-36	2.23-36	3.78-36	6.19-36	9.85-36
35	0.00+00	3.16-38	4.07-38	6.70-38	1.18-37	2.09-37	3.70-37	6.44-37	1.10-36	1.82-36	2.97-36	4.72-36	7.38-36	1.14-35
30	0.00+00	5.10-38	7.13-38	1.28-37	2.35-37	4.14-37	7.01-37	1.14-36	1.80-36	2.75-36	4.14-36	6.12-36	8.94-36	1.30-35
29	0.00+00	5.65-38	7.99-38	1.45-37	2.68-37	4.73-37	7.98-37	1.29-36	2.01-36	3.05-36	4.53-36	6.59-36	9.46-36	1.34-35
28	0.00+00	6.29-38	8.96-38	1.65-37	3.06-37	5.42-37	9.13-37	1.47-36	2.28-36	3.42-36	5.01-36	7.18-36	1.01-35	1.40-35
27	0.00+00	7.02-38	1.01-37	1.87-37	3.50-37	6.23-37	1.05-36	1.69-36	2.60-36	3.88-36	5.62-36	7.94-36	1.10-35	1.48-35
26	0.00+00	7.88-38	1.14-37	2.13-37	4.02-37	7.19-37	1.22-36	1.95-36	3.00-36	4.46-36	6.40-36	8.92-36	1.20-35	1.56-35
25	0.00+00	8.88-38	1.29-37	2.44-37	4.64-37	8.35-37	1.42-36	2.28-36	3.51-36	5.20-36	7.42-36	1.02-35	1.34-35	1.66-35
24	0.00+00	1.01-37	1.48-37	2.81-37	5.39-	9.77-37	1.67-36	2.70-36	4.16-36	6.16-36	8.76-36	1.19-35	1.52-35	1.75-35
23	0.00+00	1.15-37	1.69-37	3.26-37	6.30-37	1.15-36	1.98-36	3.23-36	5.01-36	7.43-36	1.05-35	1.42-35	1.74-35	1.78-35
22	0.00+00	1.32-37	1.96-37	3.81-37	7.43-37	1.37-36	2.38-36	3.92-36	6.13-36	9.15-36	1.30-35	1.72-35	2.01-35	1.62-35
21	0.00+00	1.52-37	2.28-37	4.49-37	8.86-37	1.65-36	2.91-36	4.83-36	7.64-36	1.15-35	1.64-35	2.13-35	2.27-35	8.45-36
20	0.00+00	1.78-37	2.68-37	5.34-37	1.07-36	2.02-36	3.60-36	6.07-36	9.74-36	1.48-35	2.12-35	2.68-35	2.36-35	-1.85-35
19	0.00+00	2.09-37	3.19-37	6.42-37	1.30-36	2.51-36	4.54-36	7.80-36	1.27-35	1.97-35	2.81-35	3.36-35	1.60-35	-1.13-34
18	0.00+00	2.48-37	3.83-37	7.83-37	1.62-36	3.17-36	5.86-36	1.03-35	1.71-35	2.70-35	3.83-35	3.98-35	-2.83-35	-5.02-34
17	0.00+00	2.98-37	4.66-37	9.69-37	2.04-36	4.09-36	7.75-36	1.40-35	2.40-35	3.85-35	5.31-35	3.27-35	-2.54-34	-2.78-33
16	0.00+00	3.62-37	5.75-37	1.22-36	2.64-36	5.43-36	1.06-35	1.98-35	3.51-35	5.73-35	7.08-35	-6.76-35	-1.76-33	-3.42-32
15	0.00+00	4.47-37	7.22-37	1.57-36	3.49-36	7.44-36	1.51-35	2.94-35	5.44-35	8.89-35	6.04-35	-9.54-34	-2.50-32	
14	0.00+00	5.60-37	9.25-37	2.08-36	4.78-36	1.06-35	2.27-35	4.68-35	9.10-35	1.35-34	-3.49-34	-1.69-32		
13	0.00+00	7.17-37	1.22-36	2.83-36	6.83-36	1.60-35	3.67-35	8.17-35	1.66-34	6.15-35	-1.03-32			
12	0.00+00	9.40-37	1.65-36	4.03-36	1.03-35	2.61-35	6.57-35	1.63-34	2.98-34	-5.16-33				
11	0.00+00	1.27-36	2.32-36	6.04-36	1.[illegible]-35	4.75-35	1.38-34	3.90-34	-1.51-33					
10	0.00+00	1.78-36	3.44-36	9.77-36	3.07-35	1.03-34	3.77-34	7.16-34						
9	0.00+00	2.62-36	5.47-36	1.77-35	6.70-35	3.02-34	1.71-33							
8	0.00+00	4.12-36	9.66-36	3.82-35	2.03-34	1.79-33								
7	0.00+00	7.13-36	2.02-35	1.15-34	1.36-33									
6	0.00+00	1.44-35	5.77-35	7.88-34										
5	0.00+00	3.84-35	3.62-34											
4	0.00+00	2.02-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	9.58-36	1.48-35	2.23-35	3.27-35	4.72-35	6.70-35	9.38-35	1.30-34	1.79-34	2.43-34	3.30-34	4.46-34	6.00-34	8.06-34
45	1.25-35	1.92-35	2.88-35	4.23-35	6.12-35	8.75-35	1.24-34	1.74-34	2.43-34	3.38-34	4.68-34	6.49-34	9.00-34	1.25-33
40	1.53-35	2.32-35	3.47-35	5.12-35	7.48-35	1.08-34	1.56-34	2.24-34	3.21-34	4.61-34	6.64-34	9.63-34	1.41-33	2.09-33
35	1.72-35	2.59-35	3.86-35	5.73-35	8.48-35	1.25-34	1.86-34	2.77-34	4.17-34	6.35-34	9.86-34	1.57-33	2.59-33	4.50-33
30	1.86-35	2.68-35	3.85-35	5.54-35	8.02-35	1.17-34	1.73-34	2.59-34	3.96-34	6.20-34	1.01-33	1.76-33	3.18-33	2.65-32
29	1.89-35	2.65-35	3.70-35	5.15-35	7.14-35	9.82-35	1.33-34	1.72-34	1.94-34	1.05-34	-5.42-34	-4.47-33	-4.27-32	
28	1.92-35	2.59-35	3.42-35	4.39-35	5.35-35	5.72-35	3.76-35	-6.16-35	-4.38-34	-1.93-33	-9.51-33	-8.60-32		
27	1.94-35	2.44-35	2.87-35	2.90-35	1.64-35	-3.41-35	-1.97-34	-7.27-34	-2.67-33	-1.23-32	-1.11-31			
26	1.92-35	2.12-35	1.79-35	-1.12-36	-6.35-35	-2.51-34	-8.37-34	-2.96-33	-1.34-32	-1.23-31				
25	1.83-35	1.46-35	-4.36-36	-6.59-35	-2.51-34	-8.29-34	-2.93-33	-1.34-32	-1.26-31					
24	1.55-35	2.11-37	-5.30-35	-2.18-34	-7.48-34	-2.71-33	-1.27-32	-1.22-31						
23	8.08-36	-3.28-35	-1.69-34	-6.26-34	-2.37-33	-1.15-32	-1.14-31							
22	-1.11-35	-1.15-34	-4.87-34	-1.97-33	-1.00-32	-1.04-31								
21	-6.31-35	-3.48-34	-1.56-33	-8.43-33	-9.24-32									
20	-2.21-34	-1.17-33	-6.85-33	-8.01-32										
19	-8.09-34	-5.35-33	-6.78-32											
18	-3.98-33	-5.58-32												
17	-4.46-32													

HE + TE = 2.00+04 NE = 1.00+05 CASE B NC = 70

TOTAL RC = 9.061-13 4-3 RC = 1.684-13 4-3 EM = 7.139-25 2S RC = 2.683-13 2P RC = 6.378-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.43-03	7.52-04	3.26-04	1.70-04	9.97-05	6.35-05	4.29-05	3.04-05	2.23-05	1.69-05	1.30-05	1.03-05	8.28-06	6.76-06
45	3.09-03	9.62-04	4.19-04	2.20-04	1.30-04	8.30-05	5.63-05	4.00-05	2.95-05	2.23-05	1.73-05	1.37-05	1.10-05	9.02-06
40	3.98-03	1.26-03	5.56-04	2.95-04	1.76-04	1.13-04	7.75-05	5.54-05	4.10-05	3.12-05	2.43-05	1.93-05	1.56-05	1.28-05
35	5.13-03	1.67-03	7.56-04	4.10-04	2.49-04	1.63-04	1.13-04	8.13-05	6.07-05	4.65-05	3.65-05	2.91-05	2.36-05	1.94-05
30	6.72-03	2.28-03	1.08-03	6.07-04	3.78-04	2.52-04	1.77-04	1.30-04	9.77-05	7.55-05	5.96-05	4.79-05	3.90-05	3.22-05
29	7.15-03	2.45-03	1.17-03	6.63-04	4.15-04	2.79-04	1.97-04	1.44-04	1.09-04	8.42-05	6.65-05	5.34-05	4.36-05	3.60-05
28	7.65-03	2.65-03	1.28-03	7.29-04	4.59-04	3.09-04	2.19-04	1.61-04	1.22-04	9.42-05	7.45-05	5.99-05	4.89-05	4.04-05
27	8.22-03	2.87-03	1.40-03	8.05-04	5.10-04	3.45-04	2.45-04	1.80-04	1.35-04	1.06-04	8.38-05	6.74-05	5.50-05	4.54-05
26	8.89-03	3.13-03	1.54-03	8.93-04	5.69-04	3.86-04	2.75-04	2.03-04	1.54-04	1.20-04	9.46-05	7.62-05	6.22-05	5.13-05
25	9.69-03	3.44-03	1.71-03	9.97-04	6.38-04	4.35-04	3.10-04	2.29-04	1.74-04	1.35-04	1.07-04	8.64-05	7.05-05	5.82-05
24	1.06-02	3.80-03	1.91-03	1.12-03	7.20-04	4.92-04	3.52-04	2.60-04	1.98-04	1.54-04	1.22-04	9.84-05	8.03-05	6.63-05
23	1.18-02	4.24-03	2.15-03	1.27-03	8.17-04	5.60-04	4.01-04	2.98-04	2.27-04	1.76-04	1.40-04	1.13-04	9.18-05	7.57-05
22	1.32-02	4.77-03	2.43-03	1.44-03	9.33-04	6.41-04	4.61-04	3.42-04	2.61-04	2.03-04	1.61-04	1.29-04	1.06-04	8.69-05
21	1.49-02	5.41-03	2.77-03	1.65-03	1.07-03	7.39-04	5.32-04	3.95-04	3.01-04	2.35-04	1.86-04	1.50-04	1.22-04	1.00-04
20	1.69-02	6.19-03	3.19-03	1.91-03	1.24-03	8.58-04	6.18-04	4.60-04	3.51-04	2.73-04	2.17-04	1.74-04	1.41-04	1.16-04
19	1.95-02	7.16-03	3.70-03	2.22-03	1.45-03	1.00-03	7.24-04	5.39-04	4.11-04	3.20-04	2.54-04	2.04-04	1.65-04	1.35-04
18	2.27-02	8.36-03	4.34-03	2.61-03	1.71-03	1.18-03	8.55-04	6.37-04	4.86-04	3.79-04	2.99-04	2.40-04	1.93-04	1.56-04
17	2.66-02	9.87-03	5.14-03	3.10-03	2.03-03	1.41-03	1.02-03	7.60-04	5.80-04	4.51-04	3.56-04	2.84-04	2.27-04	1.80-04
16	3.17-02	1.18-02	6.16-03	3.72-03	2.45-03	1.70-03	1.23-03	9.17-04	7.00-04	5.43-04	4.27-04	3.37-04	2.65-04	1.96-04
15	3.83-02	1.43-02	7.47-03	4.53-03	2.98-03	2.08-03	1.50-03	1.12-03	8.54-04	6.60-04	5.15-04	3.99-04	2.93-04	
14	4.69-02	1.75-02	9.20-03	5.59-03	3.69-03	2.57-03	1.86-03	1.39-03	1.05-03	8.10-04	6.19-04	4.49-04		
13	5.83-02	2.18-02	1.15-02	7.02-03	4.64-03	3.24-03	2.35-03	1.75-03	1.32-03	9.93-04	7.11-04			
12	7.40-02	2.78-02	1.47-02	8.99-03	5.96-03	4.17-03	3.02-03	2.23-03	1.65-03	1.17-03				
11	9.60-02	3.61-02	1.92-02	1.18-02	7.84-03	5.49-03	3.96-03	2.88-03	2.00-03					
10	1.28-01	4.83-02	2.58-02	1.59-02	1.06-02	7.42-03	5.28-03	3.61-03						
9	1.76-01	6.68-02	3.59-02	2.23-02	1.49-02	1.03-02	6.92-03							
8	2.52-01	9.64-02	5.24-02	3.27-02	2.18-02	1.43-02								
7	3.82-01	1.47-01	8.10-02	5.08-02	3.24-02									
6	6.23-01	2.44-01	1.36-01	8.32-02										
5	1.14+00	4.53-01	2.52-01											
4	2.47+00	1.00+00												
3	7.48+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.59-06	4.67-06	3.95-06	3.36-06	2.89-06	2.50-06	2.18-06	1.91-06	1.68-06	1.49-06	1.33-06	1.19-06	1.06-06	9.58-07
45	7.46-06	6.25-06	5.28-06	4.51-06	3.88-06	3.36-06	2.93-06	2.57-06	2.26-06	2.01-06	1.78-06	1.60-06	1.43-06	1.29-06
40	1.06-05	8.89-06	7.53-06	6.44-06	5.54-06	4.81-06	4.20-06	3.68-06	3.25-06	2.88-06	2.57-06	2.29-06	2.06-06	1.85-06
35	1.62-05	1.36-05	1.16-05	9.90-06	8.54-06	7.42-06	6.48-06	5.69-06	5.02-06	4.45-06	3.96-06	3.54-06	3.16-06	2.84-06
30	2.69-05	2.26-05	1.93-05	1.65-05	1.42-05	1.23-05	1.08-05	9.42-06	8.28-06	7.29-06	6.41-06	5.62-06	4.86-06	3.96-06
29	3.00-05	2.53-05	2.15-05	1.84-05	1.59-05	1.38-05	1.20-05	1.05-05	9.18-06	8.04-06	7.02-06	6.04-06	4.90-06	
28	3.37-05	2.84-05	2.41-05	2.07-05	1.78-05	1.54-05	1.34-05	1.17-05	1.02-05	8.83-06	7.56-06	6.11-06		
27	3.79-05	3.20-05	2.71-05	2.32-05	1.99-05	1.72-05	1.49-05	1.29-05	1.12-05	9.54-06	7.67-06			
26	4.28-05	3.61-05	3.06-05	2.61-05	2.24-05	1.93-05	1.66-05	1.43-05	1.21-05	9.71-06				
25	4.85-05	4.08-05	3.46-05	2.95-05	2.52-05	2.16-05	1.85-05	1.56-05	1.24-05					
24	5.52-05	4.64-05	3.92-05	3.33-05	2.83-05	2.41-05	2.02-05	1.60-05						
23	6.30-05	5.28-05	4.45-05	3.76-05	3.17-05	2.64-05	2.08-05							
22	7.21-05	6.03-05	5.06-05	4.23-05	3.50-05	2.74-05								
21	8.29-05	6.89-05	5.73-05	4.71-05	3.65-05									
20	9.55-05	7.87-05	6.41-05	4.94-05										
19	1.10-04	8.88-05	6.78-05											
18	1.25-04	9.48-05												
17	1.35-04													

HE + TE = 2.00+04 NE = 1.00+05 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	5.46-39	-8.29-39	-3.86-38	-9.36-38	-1.76-37	-2.79-37	-3.85-37	-4.56-37	-4.35-37	-2.33-37	2.76-37	1.26-36	2.97-36
45	0.00+00	8.71-39	-6.47-39	-3.88-38	-9.51-38	-1.73-37	-2.54-37	-3.01-37	-2.46-37	1.76-38	6.51-37	1.88-36	4.04-36	7.56-36
40	0.00+00	1.45-38	-1.08-39	-3.26-38	-8.46-38	-1.46-37	-1.85-37	-1.36-37	1.14-37	7.43-37	2.02-36	4.34-36	8.27-36	1.46-35
35	0.00+00	2.57-38	1.40-38	-6.30-39	-3.42-38	-4.69-38	1.09-38	2.43-37	8.25-37	2.04-36	4.31-36	8.31-36	1.50-35	2.59-35
30	0.00+00	4.75-38	4.92-38	6.23-38	9.81-38	1.97-37	4.42-37	9.81-37	2.07-36	4.11-36	7.76-36	1.41-35	2.47-35	4.23-35
29	0.00+00	5.39-38	5.97-38	8.33-38	1.39-37	2.70-37	5.66-37	1.18-36	2.39-36	4.62-36	8.59-36	1.54-35	2.70-35	4.62-35
28	0.00+00	6.11-38	7.18-38	1.08-37	1.85-37	3.53-37	7.06-37	1.41-36	2.74-36	5.17-36	9.45-36	1.68-35	2.93-35	5.03-35
27	0.00+00	6.93-38	8.55-38	1.35-37	2.39-37	4.49-37	8.65-37	1.66-36	3.13-36	5.76-36	1.04-35	1.83-35	3.17-35	5.45-35
26	0.00+00	7.87-38	1.01-37	1.67-37	3.00-37	5.58-37	1.05-36	1.95-36	3.57-36	6.42-36	1.14-35	1.98-35	3.43-35	5.91-35
25	0.00+00	8.95-38	1.19-37	2.03-37	3.71-37	6.84-37	1.26-36	2.28-36	4.07-36	7.17-36	1.25-35	2.16-35	3.71-35	6.40-35
24	0.00+00	1.02-37	1.40-37	2.45-37	4.53-37	8.33-37	1.51-36	2.67-36	4.66-36	8.04-36	1.38-35	2.35-35	4.01-35	6.92-35
23	0.00+00	1.17-37	1.63-37	2.94-37	5.50-37	1.01-36	1.80-36	3.15-36	5.38-36	9.09-36	1.53-35	2.57-35	4.35-35	7.46-35
22	0.00+00	1.34-37	1.91-37	3.52-37	6.66-37	1.22-36	2.17-36	3.74-36	6.29-36	1.04-35	1.72-35	2.84-35	4.72-35	7.98-35
21	0.00+00	1.55-37	2.25-37	4.22-37	8.08-37	1.49-36	2.64-36	4.51-36	7.49-36	1.22-35	1.97-35	3.16-35	5.10-35	8.25-35
20	0.00+00	1.80-37	2.65-37	5.07-37	9.84-37	1.83-36	3.25-36	5.53-36	9.12-36	1.46-35	2.31-35	3.57-35	5.36-35	7.53-35
19	0.00+00	2.11-37	3.16-37	6.14-37	1.21-36	2.28-36	4.07-36	6.94-36	1.14-35	1.81-35	2.78-35	4.01-35	5.02-35	2.91-35
18	0.00+00	2.50-37	3.79-37	7.51-37	1.50-36	2.87-36	5.20-36	8.96-36	1.48-35	2.33-35	3.42-35	4.27-35	2.04-35	-1.93-34
17	0.00+00	3.00-37	4.61-37	9.31-37	1.90-36	3.70-36	6.83-36	1.20-35	1.99-35	3.11-35	4.25-35	3.22-35	-1.35-34	-1.52-33
16	0.00+00	3.64-37	5.68-37	1.17-36	2.46-36	4.90-36	9.26-36	1.66-35	2.82-35	4.34-35	4.90-35	-5.51-35	-1.13-33	-1.88-32
15	0.00+00	4.49-37	7.13-37	1.51-36	3.25-36	6.69-36	1.31-35	2.43-35	4.21-35	6.20-35	2.19-35	-7.16-34	-1.50-32	
14	0.00+00	5.62-37	9.13-37	1.99-36	4.45-36	9.53-36	1.95-35	3.79-35	6.74-35	8.05-35	-3.39-34	-1.11-32		
13	0.00+00	7.19-37	1.20-36	2.72-36	6.34-36	1.43-35	3.11-35	6.44-35	1.14-34	-3.98-35	-7.39-33			
12	0.00+00	9.43-37	1.62-36	3.86-36	9.55-36	2.32-35	5.49-35	1.23-34	1.64-34	-4.18-33				
11	0.00+00	1.27-36	2.28-36	5.78-36	1.55-35	4.17-35	1.12-34	2.71-34	-1.63-33					
10	0.00+00	1.78-36	3.38-36	9.33-36	2.81-35	8.87-35	2.93-34	1.52-34						
9	0.00+00	2.62-36	5.38-36	1.68-35	6.08-35	2.53-34	1.13-33							
8	0.00+00	4.12-36	9.48-36	3.61-35	1.81-34	1.39-3.								
7	0.00+00	7.14-36	1.97-35	1.08-34	1.16-33									
6	0.00+00	1.44-35	5.61-35	7.20-34										
5	0.00+00	3.83-35	3.47-34											
4	0.00+00	2.01-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.69-36	9.82-36	1.59-35	2.45-35	3.65-35	5.28-35	7.47-35	1.04-34	1.41-34	1.90-34	2.51-34	3.29-34	4.26-34	5.44-34
45	1.31-35	2.13-35	3.35-35	5.09-35	7.56-35	1.10-34	1.58-34	2.23-34	3.11-34	4.39-34	5.91-34	8.07-34	1.10-33	1.49-33
40	2.45-35	3.96-35	6.22-35	9.54-35	1.44-34	2.13-34	3.14-34	4.58-34	6.65-34	9.6.-34	1.39-33	2.03-33	2.96-33	4.36-33
35	4.31-35	7.00-35	1.11-34	1.75-34	2.71-34	4.19-34	6.47-34	1.00-33	1.56-33	2.45-33	3.93-33	6.46-33	1.10-32	1.97-32
30	7.12-35	1.18-34	1.95-34	3.22-34	5.35-34	8.97-34	1.54-33	2.72-33	5.02-33	9.94-33	2.18-32	5.69-32	2.04-31	1.60-30
29	7.81-35	1.31-34	2.19-34	3.67-34	6.22-34	1.07-33	1.91-33	3.55-33	7.05-33	1.55-32	4.04-32	1.45-31	1.13-30	
28	8.54-35	1.45-34	2.45-34	4.20-34	7.30-34	1.31-33	2.44-33	4.86-33	1.07-32	2.78-32	9.93-32	7.72-31		
27	9.33-35	1.60-34	2.76-34	4.83-34	8.70-34	1.63-33	3.25-33	7.15-33	1.85-32	6.56-32	5.06-31			
26	1.02-34	1.77-34	3.12-34	5.63-34	1.06-33	2.11-33	4.62-33	1.19-32	4.16-32	3.17-31				
25	1.11-34	1.96-34	3.54-34	6.64-34	1.32-33	2.87-33	7.28-33	2.51-32	1.87-31					
24	1.21-34	2.17-34	4.03-34	7.90-34	1.69-33	4.20-33	1.40-32	1.00-31						
23	1.31-34	2.38-34	4.54-34	9.35-34	2.21-33	6.80-33	4.41-32							
22	1.38-34	2.50-34	4.76-34	9.90-34	2.44-33	1 00-32								
21	1.34-34	2.14-34	2.97-34	-6.45-35	-9.66-33									
20	8.19-35	-5.28-35	-1.33-33	-1.99-32										
19	-1.86-34	-1.80-33	-2.39-32											
18	-1.80-33	-2.42-32												
17	-2.21-32													

HE + TE = 2.00+04 NE = 1.00+06 CASE B NC = 70

TOTAL RC = 9.104-13 4-3 RC = 1.659-13 4-3 EM = 7.031-25 2S RC = 2.710-13 2P RC = 6.394-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.17-03	9.73-04	4.19-04	2.17-04	1.27-04	8.04-05	5.41-05	3.82-05	2.79-05	2.10-05	1.62-05	1.28-05	1.03-05	8.36-06
45	3.95-03	1.22-03	5.23-04	2.72-04	1.59-04	1.01-04	6.78-05	4.79-05	3.50-05	2.64-05	2.04-05	1.61-05	1.29-05	1.05-05
40	5.06-03	1.56-03	6.73-04	3.50-04	2.05-04	1.30-04	8.78-05	6.20-05	4.54-05	3.43-05	2.65-05	2.09-05	1.68-05	1.37-05
35	6.82-03	2.11-03	9.16-04	4.79-04	2.81-04	1.79-04	1.21-04	8.59-05	6.31-05	4.77-05	3.69-05	2.92-05	2.34-05	1.91-05
30	9.62-03	3.02-03	1.33-03	7.01-04	4.16-04	2.68-04	1.82-04	1.30-04	9.59-05	7.28-05	5.66-05	4.49-05	3.62-05	2.96-05
29	1.03-02	3.26-03	1.44-03	7.63-04	4.54-04	2.93-04	2.00-04	1.43-04	1.06-04	8.03-05	6.25-05	4.96-05	4.00-05	3.28-05
28	1.11-02	3.52-03	1.56-03	8.32-04	4.97-04	3.22-04	2.20-04	1.58-04	1.17-04	8.90-05	6.94-05	5.51-05	4.45-05	3.65-05
27	1.19-02	3.80-03	1.70-03	9.11-04	5.47-04	3.55-04	2.44-04	1.75-04	1.30-04	9.92-05	7.74-05	6.16-05	4.98-05	4.09-05
26	1.28-02	4.12-03	1.86-03	1.00-03	6.04-04	3.94-04	2.72-04	1.95-04	1.45-04	1.11-04	8.70-05	6.93-05	5.61-05	4.60-05
25	1.38-02	4.47-03	2.03-03	1.10-03	6.71-04	4.39-04	3.04-04	2.20-04	1.64-04	1.25-04	9.83-05	7.84-05	6.35-05	5.22-05
24	1.48-02	4.87-03	2.24-03	1.23-03	7.49-04	4.93-04	3.43-04	2.48-04	1.86-04	1.43-04	1.12-04	8.93-05	7.25-05	5.95-05
23	1.60-02	5.32-03	2.47-03	1.37-03	8.42-04	5.58-04	3.89-04	2.83-04	2.12-04	1.63-04	1.28-04	1.03-04	8.32-05	6.84-05
22	1.73-02	5.85-03	2.75-03	1.54-03	9.54-04	6.35-04	4.45-04	3.25-04	2.44-04	1.88-04	1.48-04	1.18-04	9.62-05	7.90-05
21	1.89-02	6.47-03	3.09-03	1.74-03	1.09-03	7.30-04	5.14-04	3.76-04	2.83-04	2.19-04	1.72-04	1.38-04	1.12-04	9.18-05
20	2.08-02	7.22-03	3.49-03	1.99-03	1.26-03	8.46-04	5.98-04	4.39-04	3.31-04	2.56-04	2.02-04	1.61-04	1.31-04	1.07-04
19	2.32-02	8.14-03	3.99-03	2.30-03	1.46-03	9.89-04	7.02-04	5.16-04	3.90-04	3.02-04	2.38-04	1.90-04	1.54-04	1.25-04
18	2.62-02	9.28-03	4.61-03	2.69-03	1.72-03	1.17-03	8.32-04	6.13-04	4.64-04	3.59-04	2.83-04	2.25-04	1.82-04	1.47-04
17	2.99-02	1.07-02	5.40-03	3.17-03	2.04-03	1.39-03	9.96-04	7.35-04	5.57-04	4.30-04	3.38-04	2.68-04	2.14-04	1.70-04
16	3.48-02	1.26-02	6.41-03	3.80-03	2.46-03	1.68-03	1.20-03	8.90-04	6.74-04	5.20-04	4.07-04	3.20-04	2.51-04	1.87-04
15	4.12-02	1.50-02	7.71-03	4.60-03	2.99-03	2.06-03	1.48-03	1.09-03	8.24-04	6.33-04	4.91-04	3.80-04	2.79-04	
14	4.96-02	1.82-02	9.45-03	5.67-03	3.70-03	2.55-03	1.83-03	1.35-03	1.02-03	7.77-04	5.91-04	4.28-04		
13	6.11-02	2.26-02	1.18-02	7.10-03	4.65-03	3.21-03	2.31-03	1.70-03	1.27-03	9.52-04	6.79-04			
12	7.69-02	2.86-02	1.50-02	9.08-03	5.97-03	4.13-03	2.96-03	2.16-03	1.59-03	1.12-03				
11	9.92-02	3.71-02	1.96-02	1.19-02	7.84-03	5.42-03	3.87-03	2.78-03	1.92-03					
10	1.32-01	4.95-02	2.62-02	1.60-02	1.06-02	7.30-03	5.13-03	3.47-03						
9	1.81-01	6.83-02	3.65-02	2.24-02	1.48-02	1.01-02	6.67-03							
8	2.59-01	9.85-02	5.30-02	3.27-02	2.15-02	1.38-02								
7	3.92-01	1.50-01	8.18-02	5.05-02	3.16-02									
6	6.39-01	2.48-01	1.37-01	8.15-02										
5	1.16+00	4.59-01	2.50-01											
4	2.53+00	1.00+00												
3	7.59+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.90-06	5.76-06	4.86-06	4.13-06	3.55-06	3.06-06	2.67-06	2.33-06	2.06-06	1.82-06	1.62-06	1.44-06	1.29-06	1.16-06
45	8.67-06	7.24-06	6.11-06	5.20-06	4.46-06	3.85-06	3.35-06	2.94-06	2.59-06	2.29-06	2.03-06	1.82-06	1.63-06	1.46-06
40	1.13-05	9.43-06	7.95-06	6.77-06	5.81-06	5.02-06	4.37-06	3.83-06	3.37-06	2.98-06	2.65-06	2.36-06	2.12-06	1.90-06
35	1.58-05	1.32-05	1.11-05	9.50-06	8.15-06	7.05-06	6.14-06	5.37-06	4.72-06	4.18-06	3.71-06	3.30-06	2.95-06	2.64-06
30	2.45-05	2.05-05	1.74-05	1.48-05	1.27-05	1.10-05	9.56-06	8.36-06	7.33-06	6.45-06	5.68-06	4.98-06	4.31-06	3.53-06
29	2.72-05	2.28-05	1.92-05	1.64-05	1.41-05	1.22-05	1.06-05	9.25-06	8.10-06	7.10-06	6.21-06	5.35-06	4.36-06	
28	3.03-05	2.54-05	2.15-05	1.83-05	1.57-05	1.36-05	1.18-05	1.03-05	8.97-06	7.81-06	6.71-06	5.45-06		
27	3.39-05	2.84-05	2.41-05	2.05-05	1.76-05	1.52-05	1.32-05	1.14-05	9.91-06	8.48-06	6.86-06			
26	3.82-05	3.21-05	2.71-05	2.31-05	1.98-05	1.71-05	1.48-05	1.27-05	1.08-05	8.73-06				
25	4.33-05	3.64-05	3.08-05	2.62-05	2.24-05	1.93-05	1.65-05	1.40-05	1.12-05					
24	4.95-05	4.15-05	3.51-05	2.98-05	2.54-05	2.17-05	1.83-05	1.45-05						
23	5.68-05	4.76-05	4.01-05	3.40-05	2.88-05	2.41-05	1.91-05							
22	6.55-05	5.48-05	4.60-05	3.87-05	3.22-05	2.53-05								
21	7.60-05	6.33-05	5.27-05	4.35-05	3.40-05									
20	8.83-05	7.29-05	5.97-05	4.62-05										
19	1.03-04	8.31-05	6.38-05											
18	1.18-04	8.95-05												
17	1.28-04													

HE + TE = 2.00+04 NE = 1.00+06 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	2.21-39	-2.27-38	-8.38-38	-2.08-37	-4.30-37	-7.89-37	-1.33-36	-2.12-36	-3.24-36	-4.77-36	-6.87-36	-9.72-36	-1.36-35
45	0.00+00	4.92-39	-2.32-38	-9.04-38	-2.25-37	-4.56-37	-8.17-37	-1.34-36	-2.07-36	-3.05-36	-4.32-36	-5.98-36	-8.15-36	-1.10-35
40	0.00+00	9.76-39	-2.15-38	-9.35-38	-2.32-37	-4.57-37	-7.82-37	-1.21-36	-1.71-36	-2.26-36	-2.78-36	-3.18-36	-3.35-36	-3.21-36
35	0.00+00	1.82-38	-1.72-38	-9.53-38	-2.38-37	-4.49-37	-7.06-37	-9.47-37	-1.05-36	-7.89-37	1.59-37	2.29-36	6.32-36	1.32-35
30	0.00+00	3.51-38	-3.15-39	-8.28-38	-2.18-37	-3.84-37	-5.01-37	-3.87-37	2.94-37	2.12-36	6.04-36	1.36-35	2.72-35	5.05-35
29	0.00+00	4.05-38	2.87-39	-7.40-38	-2.01-37	-3.46-37	-4.09-37	-1.73-37	7.63-37	3.10-36	8.00-36	1.74-35	3.43-35	6.37-35
28	0.00+00	4.70-38	1.08-38	-6.12-38	-1.76-37	-2.92-37	-2.87-37	9.76-38	1.34-36	4.29-36	1.04-35	2.20-35	4.30-35	8.00-35
27	0.00+00	5.48-38	2.11-38	-4.34-38	-1.41-37	-2.18-37	-1.27-37	4.38-37	2.05-36	5.73-36	1.32-35	2.76-35	5.38-35	1.01-34
26	0.00+00	6.41-38	3.44-38	-1.92-38	-9.27-38	-1.19-37	7.88-38	8.63-37	2.92-36	7.47-36	1.67-35	3.44-35	6.71-35	1.27-34
25	0.00+00	7.54-38	5.12-38	1.21-38	-2.91-38	9.85-39	3.38-37	1.38-36	3.96-36	9.56-36	2.09-35	4.27-35	8.36-35	1.60-34
24	0.00+00	8.90-38	7.25-38	5.40-38	5.33-38	1.73-37	6.60-37	2.02-36	5.21-36	1.20-35	2.58-35	5.27-35	1.04-34	2.02-34
23	0.00+00	1.05-37	9.89-38	1.06-37	1.58-37	3.78-37	1.05-36	2.78-36	6.69-36	1.50-35	3.18-35	6.50-35	1.30-34	2.59-34
22	0.00+00	1.25-37	1.31-37	1.72-37	2.89-37	6.30-37	1.53-36	3.68-36	8.43-36	1.84-35	3.88-35	8.00-35	1.63-34	3.35-34
21	0.00+00	1.49-37	1.71-37	2.53-37	4.51-37	9.42-37	2.11-36	4.76-36	1.05-35	2.25-35	4.74-35	9.87-35	2.07-34	4.41-34
20	0.00+00	1.77-37	2.19-37	3.52-37	6.51-37	1.33-36	2.82-36	6.08-36	1.30-35	2.75-35	5.79-35	1.23-34	2.66-34	6.01-34
19	0.00+00	2.12-37	2.78-37	4.75-37	9.01-37	1.80-36	3.71-36	7.70-36	1.60-35	3.36-35	7.12-35	1.55-34	3.51-34	8.58-34
18	0.00+00	2.54-37	3.50-37	6.27-37	1.21-36	2.41-36	4.83-36	9.76-36	1.99-35	4.14-35	8.85-35	1.98-34	4.78-34	1.32-33
17	0.00+00	3.06-37	4.39-37	8.19-37	1.62-36	3.21-36	6.34-36	1.25-35	2.52-35	5.19-35	1.12-34	2.60-34	6.82-34	2.25-33
16	0.00+00	3.72-37	5.52-37	1.07-36	2.15-36	4.30-36	8.45-36	1.65-35	3.28-35	6.70-35	1.45-34	3.41-34	9.24-34	2.86-33
15	0.00+00	4.57-37	6.99-37	1.46-36	2.90-36	5.88-36	1.16-35	2.28-35	4.47-35	8.93-35	1.80-34	3.06-34	-2.03-33	
14	0.00+00	5.72-37	8.98-37	1.87-36	3.99-36	8.31-36	1.68-35	3.33-35	6.48-35	1.17-34	8.75-35	-3.62-33		
13	0.00+00	7.29-37	1.18-36	2.55-36	5.69-36	1.24-35	2.60-35	5.31-35	9.94-35	6.97-35	-3.45-33			
12	0.00+00	9.52-37	1.59-36	3.62-36	8.53-36	1.97-35	4.44-35	9.47-35	1.27-34	-2.44-33				
11	0.00+00	1.28-36	2.24-36	5.40-36	1.38-35	3.49-35	8.73-35	1.88-34	-1.20-33					
10	0.00+00	1.79-36	3.31-36	8.69-36	2.47-35	7.26-35	2.15-34	-8.93-35						
9	0.00+00	2.64-36	5.24-36	1.56-35	5.28-35	2.00-34	6.79-34							
8	0.00+00	4.14-36	9.21-36	3.32-35	1.54-34	1.01-33								
7	0.00+00	7.16-36	1.91-35	9.76-35	9.34-34									
6	0.00+00	1.44-35	5.38-35	6.31-34										
5	0.00+00	3.83-35	3.27-34											
4	0.00+00	2.00-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.90-35	-2.64-35	-3.67-35	-5.11-35	-7.15-35	-1.00-34	-1.41-34	-1.97-34	-2.77-34	-3.87-34	-5.39-34	-7.48-34	-1.04-33	-1.43-33
45	-1.50-35	-2.05-35	-2.85-35	-4.04-35	-5.81-35	-8.48-35	-1.25-34	-1.85-34	-2.75-34	-4.08-34	-6.04-34	-8.91-34	-1.31-33	-1.94-33
40	-2.68-36	-1.85-36	-1.04-36	-1.03-36	-3.34-36	-1.07-35	-2.78-35	-6.26-35	-1.28-34	-2.43-34	-4.44-34	-7.86-34	-1.37-33	-2.36-33
35	2.43-35	4.13-35	6.65-35	1.02-34	1.53-34	2.21-34	3.12-34	4.29-34	5.76-34	7.51-34	9.42-34	1.10-33	1.08-33	4.75-34
30	8.96-35	1.54-34	2.58-34	4.27-34	7.01-34	1.16-33	1.92-33	3.27-33	5.77-33	1.08-32	2.23-32	5.43-32	1.80-31	1.29-30
29	1.14-34	1.97-34	3.36-34	5.69-34	9.62-34	1.65-33	2.87-33	5.21-33	1.00-32	2.12-32	5.32-32	1.82-31	1.36-30	
28	1.44-34	2.53-34	4.41-34	7.67-34	1.35-33	2.41-33	4.47-33	8.81-33	1.91-32	4.90-32	1.72-31	1.32-30		
27	1.83-34	3.28-34	5.86-34	1.05-33	1.93-33	3.67-33	7.39-33	1.64-32	4.28-32	1.53-31	1.19-30			
26	2.34-34	4.29-34	7.91-34	1.48-33	2.88-33	5.92-33	1.34-32	3.56-32	1.29-31	1.02-30				
25	3.01-34	5.70-34	1.09-33	2.16-33	4.53-33	1.04-32	2.82-32	1.04-31	8.32-31					
24	3.92-34	7.70-34	1.56-33	3.32-33	7.76-33	2.13-32	7.96-32	6.41-31						
23	5.19-34	1.07-33	2.32-33	5.51-33	1.53-32	5.77-32	4.67-31							
22	7.03-34	1.55-33	3.72-33	1.04-32	3.95-32	3.20-31								
21	9.87-34	2.40-33	6.77-33	2.56-32	2.05-31									
20	1.47-33	4.16-33	1.57-32	1.23-31										
19	2.41-33	8.96-33	6.83-32											
18	4.72-33	3.35-32												
17	1.35-32													

HE + TE = 2.00+04 NE = 1.00+07 CASE B NC = 57

TOTAL RC = 9.186-13 4-3 RC = 1.622-13 4-3 EM = 6.875-25 2S RC = 2.756-13 2P RC = 6.430-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.87-03	1.19-03	5.11-04	2.65-04	1.54-04	9.78-05	6.58-05	4.64-05	3.39-05	2.55-05	1.97-05	1.55-05	1.25-05	1.01-05
45	5.10-03	1.56-03	6.72-04	3.48-04	2.03-04	1.29-04	8.67-05	6.11-05	4.47-05	3.36-05	2.60-05	2.05-05	1.64-05	1.33-05
40	6.76-03	2.07-03	8.92-04	4.62-04	2.70-04	1.71-04	1.15-04	8.11-05	5.93-05	4.47-05	3.45-05	2.72-05	2.18-05	1.77-05
35	8.99-03	2.76-03	1.19-03	6.16-04	3.60-04	2.28-04	1.54-04	1.08-04	7.92-05	5.96-05	4.60-05	3.63-05	2.91-05	2.37-05
30	1.23-02	3.78-03	1.63-03	8.46-04	4.95-04	3.14-04	2.12-04	1.49-04	1.09-04	8.24-05	6.36-05	5.02-05	4.02-05	3.27-05
29	1.32-02	4.06-03	1.75-03	9.10-04	5.32-04	3.38-04	2.28-04	1.61-04	1.18-04	8.89-05	6.86-05	5.41-05	4.34-05	3.53-05
28	1.42-02	4.38-03	1.89-03	9.84-04	5.76-04	3.66-04	2.47-04	1.74-04	1.28-04	9.64-05	7.44-05	5.87-05	4.71-05	3.83-05
27	1.54-02	4.75-03	2.05-03	1.07-03	6.27-04	3.99-04	2.69-04	1.90-04	1.39-04	1.05-04	8.13-05	6.41-05	5.14-05	4.19-05
26	1.67-02	5.18-03	2.24-03	1.17-03	6.86-04	4.36-04	2.95-04	2.09-04	1.53-04	1.15-04	8.93-05	7.04-05	5.65-05	4.60-05
25	1.83-02	5.66-03	2.46-03	1.28-03	7.55-04	4.81-04	3.25-04	2.30-04	1.69-04	1.28-04	9.88-05	7.80-05	6.26-05	5.10-05
24	2.00-02	6.23-03	2.71-03	1.42-03	8.35-04	5.33-04	3.61-04	2.56-04	1.88-04	1.42-04	1.10-04	8.69-05	6.98-05	5.69-05
23	2.20-02	6.87-03	3.00-03	1.58-03	9.30-04	5.95-04	4.04-04	2.87-04	2.11-04	1.60-04	1.24-04	9.77-05	7.85-05	6.39-05
22	2.43-02	7.60-03	3.33-03	1.76-03	1.04-03	6.68-04	4.55-04	3.23-04	2.38-04	1.81-04	1.40-04	1.11-04	8.90-05	7.25-05
21	2.68-02	8.44-03	3.72-03	1.97-03	1.17-03	7.56-04	5.16-04	3.68-04	2.72-04	2.06-04	1.60-04	1.27-04	1.02-04	8.30-05
20	2.96-02	9.41-03	4.18-03	2.23-03	1.33-03	8.63-04	5.91-04	4.22-04	3.13-04	2.38-04	1.85-04	1.46-04	1.18-04	9.59-05
19	3.28-02	1.05-02	4.72-03	2.54-03	1.53-03	9.94-04	6.83-04	4.90-04	3.64-04	2.77-04	2.16-04	1.71-04	1.38-04	1.12-04
18	3.65-02	1.18-02	5.37-03	2.92-03	1.77-03	1.16-03	8.00-04	5.76-04	4.29-04	3.27-04	2.55-04	2.02-04	1.62-04	1.31-04
17	4.07-02	1.34-02	6.17-03	3.39-03	2.07-03	1.37-03	9.49-04	6.86-04	5.12-04	3.92-04	3.05-04	2.42-04	1.93-04	1.53-04
16	4.57-02	1.53-02	7.17-03	3.99-03	2.47-03	1.64-03	1.14-03	8.30-04	6.20-04	4.75-04	3.69-04	2.90-04	2.28-04	1.70-04
15	5.19-02	1.77-02	8.46-03	4.77-03	2.98-03	1.99-03	1.40-03	1.02-03	7.62-04	5.82-04	4.50-04	3.48-04	2.57-04	
14	6.01-02	2.09-02	1.02-02	5.81-03	3.67-03	2.47-03	1.74-03	1.27-03	9.48-04	7.20-04	5.47-04	3.98-04		
13	7.10-02	2.51-02	1.25-02	7.23-03	4.60-03	3.12-03	2.20-03	1.60-03	1.19-03	3.89-04	6.35-04			
12	8.63-02	3.10-02	1.56-02	9.20-03	5.90-03	4.01-03	2.83-03	2.05-03	1.50-03	1.05-03				
11	1.08-01	3.94-02	2.02-02	1.20-02	7.75-03	5.27-03	3.71-03	2.64-03	1.81-03					
10	1.41-01	5.18-02	2.69-02	1.61-02	1.05-02	7.10-03	4.91-03	3.29-03						
9	1.91-01	7.10-02	3.72-02	2.25-02	1.46-02	9.75-03	6.36-03							
8	2.71-01	1.02-01	5.39-02	3.26-02	2.10-02	1.33-02								
7	4.08-01	1.55-01	8.27-02	4.99-02	3.04-02									
6	6.65-01	2.54-01	1.37-01	7.93-02										
5	1.21+00	4.67-01	2.46-01											
4	2.62+00	1.00+00												
3	7.75+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.36-06	6.97-06	5.88-06	5.00-06	4.29-06	3.71-06	3.22-06	2.82-06	2.48-06	2.20-06	1.95-06	1.74-06	1.56-06	1.41-06
45	1.10-05	9.18-06	7.74-06	6.58-06	5.64-06	4.88-06	4.24-06	3.71-06	3.27-06	2.89-06	2.57-06	2.29-06	2.05-06	1.85-06
40	1.46-05	1.22-05	1.03-05	8.73-06	7.49-06	6.47-06	5.62-06	4.92-06	4.33-06	3.83-06	3.40-06	3.03-06	2.71-06	2.44-06
35	1.95-05	1.63-05	1.37-05	1.17-05	1.00-05	8.63-06	7.50-06	6.56-06	5.76-06	5.09-06	4.51-06	4.01-06	3.58-06	3.20-06
30	2.70-05	2.25-05	1.90-05	1.61-05	1.38-05	1.19-05	1.03-05	9.00-06	7.88-06	6.92-06	6.08-06	5.32-06	4.61-06	3.76-06
29	2.91-05	2.43-05	2.05-05	1.74-05	1.49-05	1.28-05	1.11-05	9.67-06	8.45-06	7.39-06	6.45-06	5.56-06	4.52-06	
28	3.16-05	2.64-05	2.22-05	1.88-05	1.61-05	1.39-05	1.20-05	1.04-05	9.09-06	7.89-06	6.77-06	5.49-06		
27	3.45-05	2.88-05	2.42-05	2.06-05	1.76-05	1.51-05	1.31-05	1.13-05	9.77-06	8.34-06	6.74-06			
26	3.79-05	3.16-05	2.66-05	2.26-05	1.93-05	1.66-05	1.42-05	1.22-05	1.04-05	8.37-06				
25	4.20-05	3.50-05	2.95-05	2.50-05	2.13-05	1.82-05	1.56-05	1.32-05	1.05-05					
24	4.69-05	3.91-05	3.28-05	2.78-05	2.36-05	2.00-05	1.68-05	1.34-05						
23	5.27-05	4.39-05	3.68-05	3.10-05	2.62-05	2.19-05	1.73-05							
22	5.98-05	4.97-05	4.16-05	3.48-05	2.89-05	2.28-05								
21	6.83-05	5.66-05	4.71-05	3.88-05	3.04-05									
20	7.87-05	6.49-05	5.31-05	4.12-05										
19	9.12-05	7.39-05	5.70-05											
18	1.05-04	8.04-05												
17	1.16-04													

HE + TE = 2.00+04 NE = 1.00+07 CASE B NC = 57

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-5.61-40	-3.56-38	-1.25-37	-3.16-37	-6.75-37	-1.29-36	-2.29-36	-3.83-36	-6.18-36	-9.65-36	-1.47-35	-2.21-35	-3.26-35
45	0.00+00	2.28-40	-4.47-38	-1.60-37	-4.05-37	-8.64-37	-1.65-36	-2.93-36	-4.94-36	-7.99-36	-1.26-35	-1.93-35	-2.93-35	-4.38-35
40	0.00+00	2.67-39	-5.39-38	-1.98-37	-5.03-37	-1.07-36	-2.05-36	-3.64-36	-6.13-36	-9.95-36	-1.58-35	-2.45-35	-3.76-35	-5.73-35
35	0.00+00	9.20-39	-5.87-38	-2.28-37	-5.84-37	-1.24-36	-2.34-36	-4.11-36	-6.87-36	-1.11-35	-1.76-35	-2.77-35	-4.33-35	-6.77-35
30	0.00+00	2.43-38	-5.27-38	-2.38-37	-6.14-37	-1.27-36	-2.32-36	-3.89-36	-6.19-36	-9.58-36	-1.47-35	-2.27-35	-3.59-35	-5.85-35
29	0.00+00	2.89-38	-5.01-38	-2.38-37	-6.16-37	-1.26-36	-2.27-36	-3.75-36	-5.84-36	-8.80-36	-1.32-35	-2.00-35	-3.15-35	-5.17-35
28	0.00+00	3.43-38	-4.69-38	-2.38-37	-6.17-37	-1.26-36	-2.22-36	-3.58-36	-5.40-36	-7.04-36	-1.13-35	-1.65-35	-2.55-35	-4.22-35
27	0.00+00	4.05-38	-4.30-38	-2.38-37	-6.19-37	-1.25-36	-2.16-36	-3.38-36	-4.88-36	-6.66-36	-8.85-36	-1.20-35	-1.75-35	-2.90-35
26	0.00+00	4.79-38	-3.82-38	-2.37-37	-6.19-37	-1.23-36	-2.09-36	-3.13-36	-4.23-36	-5.58-36	-7.38-36	-9.06-36	-6.72-36	-1.02-35
25	0.00+00	5.67-38	-3.19-38	-2.34-37	-6.17-37	-1.21-36	-1.99-36	-2.82-36	-3.41-36	-3.27-36	-1.73-36	1.97-36	8.45-36	1.72-35
24	0.00+00	6.74-38	-2.34-38	-2.28-37	-6.08-37	-1.18-36	-1.85-36	-2.40-36	-2.31-36	-7.23-37	3.78-36	1.32-35	3.05-35	5.90-35
23	0.00+00	8.05-38	-1.16-38	-2.16-37	-5.87-37	-1.11-36	-1.65-36	-1.81-36	-8.13-37	2.79-36	1.15-35	2.95-35	6.36-35	1.25-34
22	0.00+00	9.68-38	5.22-39	-1.94-37	-5.46-37	-1.00-36	-1.34-36	-9.70-37	1.29-36	7.74-36	2.26-35	5.37-35	1.15-34	2.36-34
21	0.00+00	1.17-37	2.91-38	-1.58-37	-4.74-37	-8.25-37	-8.68-37	2.38-37	4.28-36	1.48-35	3.90-35	9.08-35	2.00-34	4.31-34
20	0.00+00	1.44-37	6.28-38	-1.00-37	-3.56-37	-5.48-37	-1.77-37	1.97-36	8.56-36	2.52-35	6.37-35	1.50-34	3.44-34	7.99-34
19	0.00+00	1.77-37	1.10-37	-1.33-38	-1.74-37	-1.32-37	8.28-37	4.45-36	1.47-35	4.04-35	1.02-34	2.47-34	6.06-34	1.57-33
18	0.00+00	2.21-37	1.76-37	1.15-37	9.77-38	4.79-37	2.27-36	7.96-36	2.35-35	6.31-35	1.62-34	4.18-34	1.13-33	3.49-33
17	0.00+00	2.78-37	2.67-37	2.98-37	4.92-37	1.36-36	4.31-36	1.30-35	3.64-35	9.83-35	2.65-34	7.47-34	2.38-33	1.00-32
16	0.00+00	3.51-37	3.90-37	5.57-37	1.05-36	2.60-36	7.19-36	2.01-35	5.57-35	1.55-34	4.52-34	1.48-33	6.35-33	5.60-32
15	0.00+00	4.47-37	5.57-37	9.16-37	1.84-36	4.36-36	1.13-35	3.07-35	8.59-35	2.54-34	8.47-34	3.65-33	3.17-32	
14	0.00+00	5.74-37	7.81-37	1.42-36	2.97-36	6.93-36	1.75-35	4.71-35	1.37-34	4.52-34	1.92-33	1.58-32		
13	0.00+00	7.43-37	1.09-36	2.13-36	4.65-36	1.09-35	2.74-35	7.51-35	2.36-34	9.41-34	6.87-33			
12	0.00+00	9.77-37	1.52-36	3.19-36	7.29-36	1.75-35	4.50-35	1.30-34	4.58-34	2.46-33				
11	0.00+00	1.32-36	2.18-36	4.89-36	1.19-35	3.03-35	8.29-35	2.58-34	7.74-34					
10	0.00+00	1.83-36	3.22-36	7.90-36	2.12-35	6.03-35	1.87-34	4.05-34						
9	0.00+00	2.68-36	5.09-36	1.41-35	4.42-35	1.56-34	5.37-34							
8	0.00+00	4.19-36	8.87-36	2.95-35	1.24-34	7.09-34								
7	0.00+00	7.22-36	1.82-35	8.49-35	7.08-34									
6	0.00+00	1.45-35	5.07-35	5.26-34										
5	0.00+00	3.84-35	3.00-34											
4	0.00+00	1.99-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-4.75-35	-6.84-35	-9.72-35	-1.37-34	-1.90-34	-2.61-34	-3.56-34	-4.81-34	-6.46-34	-8.60-34	-1.14-33	-1.50-33	-1.96-33	-2.55-33
45	-6.48-35	-9.47-35	-1.37-34	-1.96-34	-2.79-34	-3.92-34	-5.48-34	-7.62-34	-1.05-33	-1.45-33	-1.98-33	-2.71-33	-3.70-33	-5.03-33
40	-8.65-35	-1.30-34	-1.93-34	-2.85-34	-4.19-34	-6.11-34	-8.88-34	-1.29-33	-1.87-33	-2.71-33	-3.94-33	-5.76-33	-8.46-33	-1.25-32
35	-1.06-34	-1.65-34	-2.58-34	-4.02-34	-6.25-34	-9.73-34	-1.52-33	-2.38-33	-3.78-33	-6.08-33	-9.98-33	-1.68-32	-2.92-32	-5.33-32
30	-9.77-35	-1.66-34	-2.88-34	-5.02-34	-8.85-34	-1.58-33	-2.90-33	-5.48-33	-1.09-32	-2.32-32	-5.50-32	-1.56-31	-6.08-31	-5.23-30
29	-8.83-35	-1.55-34	-2.79-34	-5.08-34	-9.38-34	-1.76-33	-3.42-33	-6.95-33	-1.51-32	-3.66-32	-1.06-31	-4.21-31	-3.71-30	
28	-7.44-35	-1.37-34	-2.60-34	-5.02-34	-9.85-34	-1.98-33	-4.15-33	-9.29-33	-2.30-32	-6.80-32	-2.78-31	-2.50-30		
27	-5.38-35	-1.08-34	-2.24-34	-4.73-34	-1.01-33	-2.24-33	-5.24-33	-1.35-32	-4.10-32	-1.72-31	-1.59-30			
26	-2.31-35	-6.05-35	-1.57-34	-3.97-34	-9.91-34	-2.53-33	-6.97-33	-2.24-32	-9.80-32	-9.40-31				
25	2.46-35	1.92-35	-3.06-35	-2.16-34	-8.06-34	-2.73-33	-1.00-32	-4.79-32	-4.92-31					
24	1.02-34	1.60-34	2.21-34	2.24-34	-1.03-34	-2.12-33	-1.55-32	-1.96-31						
23	2.34-34	4.24-34	7.63-34	1.39-33	2.57-33	4.55-33	-9.68-33							
22	4.73-34	9.62-34	2.07-33	5.00-33	1.57-32	9.91-32								
21	9.42-34	2.19-33	5.81-33	2.05-32	1.52-31									
20	1.97-33	5.54-33	2.08-32	1.66-31										
19	4.64-33	1.82-32	1.51-31											
18	1.42-32	1.22-31												
17	8.74-32													

HE + TE = 2.00+04 NE = 1.00+08 CASE B NC = 36

TOTAL RC = 9.342-13 4-3 RC = 1.574-13 4-3 EM = 6.672-25 2S RC = 2.835-13 2P RC = 6.507-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.22-03	1.29-03	5.56-04	2.88-04	1.68-04	1.06-04	7.16-05	5.05-05	3.69-05	2.78-05	2.14-05	1.69-05	1.35-05	1.10-05
45	5.74-03	1.76-03	7.57-04	3.92-04	2.29-04	1.45-04	9.74-05	6.87-05	5.02-05	3.78-05	2.92-05	2.30-05	1.84-05	1.50-05
40	8.04-03	2.47-03	1.06-03	5.49-04	3.20-04	2.03-04	1.36-04	9.61-05	7.03-05	5.29-05	4.08-05	3.21-05	2.58-05	2.10-05
35	1.15-02	3.54-03	1.52-03	7.87-04	4.59-04	2.91-04	1.96-04	1.38-04	1.01-04	7.58-05	5.85-05	4.61-05	3.69-05	3.00-05
30	1.68-02	5.16-03	2.22-03	1.15-03	6.70-04	4.24-04	2.86-04	2.01-04	1.47-04	1.11-04	8.53-05	6.72-05	5.38-05	4.37-05
29	1.81-02	5.57-03	2.39-03	1.24-03	7.23-04	4.58-04	3.08-04	2.17-04	1.59-04	1.19-04	9.20-05	7.24-05	5.80-05	4.72-05
28	1.96-02	6.00-03	2.58-03	1.34-03	7.80-04	4.94-04	3.32-04	2.34-04	1.71-04	1.29-04	9.93-05	7.81-05	6.26-05	5.09-05
27	2.11-02	6.47-03	2.78-03	1.44-03	8.41-04	5.33-04	3.58-04	2.53-04	1.85-04	1.39-04	1.07-04	8.43-05	6.75-05	5.48-05
26	2.27-02	6.98-03	3.00-03	1.56-03	9.08-04	5.75-04	3.87-04	2.73-04	1.99-04	1.50-04	1.16-04	9.09-05	7.28-05	5.91-05
25	2.45-02	7.53-03	3.24-03	1.68-03	9.80-04	6.21-04	4.18-04	2.94-04	2.15-04	1.62-04	1.25-04	9.82-05	7.86-05	6.39-05
24	2.65-02	8.15-03	3.51-03	1.82-03	1.06-03	6.72-04	4.53-04	3.19-04	2.33-04	1.75-04	1.35-04	1.06-04	8.51-05	6.91-05
23	2.88-02	8.85-03	3.81-03	1.98-03	1.15-03	7.31-04	4.92-04	3.47-04	2.53-04	1.91-04	1.47-04	1.16-04	9.25-05	7.51-05
22	3.14-02	9.66-03	4.16-03	2.16-03	1.26-03	8.00-04	5.39-04	3.80-04	2.77-04	2.09-04	1.61-04	1.27-04	1.01-04	8.20-05
21	3.45-02	1.06-02	4.58-03	2.38-03	1.39-03	8.82-04	5.94-04	4.19-04	3.06-04	2.30-04	1.78-04	1.40-04	1.12-04	9.04-05
20	3.82-02	1.18-02	5.09-03	2.64-03	1.55-03	9.83-04	6.62-04	4.67-04	3.42-04	2.57-04	1.98-04	1.56-04	1.24-04	1.00-04
19	4.27-02	1.32-02	5.71-03	2.97-03	1.74-03	1.11-03	7.46-04	5.27-04	3.85-04	2.90-04	2.23-04	1.75-04	1.40-04	1.13-04
18	4.81-02	1.49-02	6.46-03	3.37-03	1.98-03	1.26-03	8.52-04	6.02-04	4.40-04	3.32-04	2.55-04	2.00-04	1.59-04	1.27-04
17	5.47-02	1.70-02	7.39-03	3.87-03	2.28-03	1.45-03	9.84-04	6.96-04	5.10-04	3.84-04	2.95-04	2.31-04	1.83-04	1.44-04
16	6.25-02	1.95-02	8.54-03	4.49-03	2.66-03	1.70-03	1.15-03	8.17-04	5.99-04	4.51-04	3.47-04	2.70-04	2.10-04	1.66-04
15	7.18-02	2.26-02	9.97-03	5.28-03	3.14-03	2.02-03	1.37-03	9.76-04	7.16-04	5.39-04	4.12-04	3.16-04	2.32-04	
14	8.30-02	2.64-02	1.18-02	6.30-03	3.77-03	2.44-03	1.67-03	1.19-03	8.72-04	6.54-04	4.93-04	3.57-04		
13	9.67-02	3.12-02	1.41-02	7.65-03	4.62-03	3.01-03	2.07-03	1.48-03	1.08-03	8.01-04	5.71-04			
12	1.14-01	3.75-02	1.73-02	9.51-03	5.82-03	3.82-03	2.63-03	1.88-03	1.36-03	9.51-04				
11	1.37-01	4.61-02	2.18-02	1.22-02	7.54-03	4.98-03	3.44-03	2.42-03	1.66-03					
10	1.70-01	5.85-02	2.83-02	1.62-02	1.01-02	6.70-03	4.57-03	3.04-03						
9	2.19-01	7.75-02	3.85-02	2.23-02	1.40-02	9.21-03	5.94-03							
8	3.00-01	1.08-01	5.51-02	3.22-02	2.01-02	1.25-02								
7	4.41-01	1.62-01	8.36-02	4.89-02	2.90-02									
6	7.08-01	2.63-01	1.37-01	7.64-02										
5	1.28+00	4.78-01	2.40-01											
4	2.75+00	1.00+00												
3	8.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	9.09-06	7.58-06	6.39-06	5.44-06	4.66-06	4.03-06	3.50-06	3.07-06	2.70-06	2.39-06	2.12-06	1.89-06	1.70-06	1.53-06
45	1.24-05	1.03-05	8.69-06	7.39-06	6.33-06	5.47-06	4.76-06	4.16-06	3.66-06	3.24-06	2.88-06	2.57-06	2.30-06	2.07-06
40	1.73-05	1.44-05	1.21-05	1.03-05	8.85-06	7.64-06	6.64-06	5.81-06	5.11-06	4.51-06	4.01-06	3.57-06	3.20-06	2.87-06
35	2.47-05	2.06-05	1.74-05	1.48-05	1.27-05	1.09-05	9.48-06	8.28-06	7.28-06	6.42-06	5.69-06	5.06-06	4.52-06	4.04-06
30	3.60-05	3.00-05	2.53-05	2.14-05	1.83-05	1.58-05	1.37-05	1.19-05	1.04-05	9.15-06	8.03-06	7.03-06	6.08-06	4.96-06
29	3.88-05	3.24-05	2.72-05	2.31-05	1.98-05	1.70-05	1.47-05	1.28-05	1.12-05	9.76-06	8.51-06	7.32-06	5.95-06	
28	4.19-05	3.49-05	2.93-05	2.49-05	2.13-05	1.83-05	1.58-05	1.37-05	1.19-05	1.03-05	8.86-06	7.18-06		
27	4.51-05	3.76-05	3.16-05	2.68-05	2.29-05	1.96-05	1.69-05	1.46-05	1.26-05	1.08-05	8.69-06			
26	4.87-05	4.05-05	3.40-05	2.88-05	2.46-05	2.10-05	1.81-05	1.55-05	1.32-05	1.06-05				
25	5.25-05	4.37-05	3.66-05	3.10-05	2.64-05	2.25-05	1.92-05	1.62-05	1.29-05					
24	5.68-05	4.72-05	3.95-05	3.34-05	2.83-05	2.40-05	2.01-05	1.60-05						
23	6.17-05	5.12-05	4.28-05	3.60-05	3.03-05	2.52-05	1.99-05							
22	6.73-05	5.57-05	4.64-05	3.88-05	3.21-05	2.52-05								
21	7.40-05	6.10-05	5.05-05	4.15-05	3.23-05									
20	8.20-05	6.72-05	5.47-05	4.23-05										
19	9.14-05	7.37-05	5.65-05											
18	1.02-04	7.72-05												
17	1.08-04													

HE + TE = 2.00+04 NE = 1.00+08 CASE B NC = 36

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-1.24-39	-4.00-38	-1.41-37	-3.60-37	-7.81-37	-1.52-36	-2.75-36	-4.72-36	-7.76-36	-1.23-35	-1.90-35	-2.85-35	-4.17-35
45	0.00+00	-1.52-39	-5.43-38	-1.92-37	-4.94-37	-1.08-36	-2.11-36	-3.83-36	-6.62-36	-1.10-35	-1.76-35	-2.74-35	-4.16-35	-6.17-35
40	0.00+00	-1.60-39	-7.54-38	-2.69-37	-6.95-37	-1.52-36	-3.00-36	-5.51-36	-9.61-36	-1.61-35	-2.62-35	-4.14-35	-6.39-35	-9.67-35
35	0.00+00	-2.51-40	-1.04-37	-3.79-37	-9.87-37	-2.18-36	-4.34-36	-8.06-36	-1.43-35	-2.43-35	-4.03-35	-6.53-35	-1.03-34	-1.61-34
30	0.00+00	6.43-39	-1.38-37	-5.21-37	-1.38-36	-3.07-36	-6.18-36	-1.17-35	-2.11-35	-3.69-35	-6.32-35	-1.06-34	-1.76-34	-2.89-34
29	0.00+00	9.35-39	-1.44-37	-5.50-37	-1.46-36	-3.26-36	-6.58-36	-1.25-35	-2.26-35	-3.99-35	-6.89-35	-1.17-34	-1.97-34	-3.27-34
28	0.00+00	1.32-38	-1.49-37	-5.76-37	-1.53-36	-3.43-36	-6.95-36	-1.32-35	-2.41-35	-4.29-35	-7.48-35	-1.29-34	-2.19-34	-3.70-34
27	0.00+00	1.81-38	-1.52-37	-6.00-37	-1.60-36	-3.60-36	-7.30-36	-1.39-35	-2.56-35	-4.59-35	-8.09-35	-1.41-34	-2.44-34	-4.21-34
26	0.00+00	2.45-38	-1.52-37	-6.19-37	-1.66-36	-3.74-36	-7.60-36	-1.46-35	-2.69-35	-4.86-35	-8.69-35	-1.54-34	-2.72-34	-4.79-34
25	0.00+00	3.25-38	-1.51-37	-6.33-37	-1.71-36	-3.85-36	-7.84-36	-1.51-35	-2.80-35	-5.11-35	-9.27-35	-1.67-34	-3.02-34	-5.46-34
24	0.00+00	4.25-38	-1.46-37	-6.41-37	-1.74-36	-3.93-36	-8.00-36	-1.54-35	-2.88-35	-5.32-35	-9.80-35	-1.81-34	-3.35-34	-6.27-34
23	0.00+00	5.50-38	-1.39-37	-6.44-37	-1.76-36	-3.97-36	-8.09-36	-1.56-35	-2.93-35	-5.48-35	-1.03-34	-1.95-34	-3.73-34	-7.26-34
22	0.00+00	7.02-38	-1.29-37	-6.42-37	-1.77-36	-4.00-36	-8.10-36	-1.56-35	-2.95-35	-5.58-35	-1.07-34	-2.09-34	-4.16-34	-8.54-34
21	0.00+00	8.89-38	-1.15-37	-6.37-37	-1.78-36	-4.00-36	-8.07-36	-1.55-35	-2.93-35	-5.63-35	-1.11-34	-2.24-34	-4.71-34	-1.03-33
20	0.00+00	1.12-37	-9.75-38	-6.29-37	-1.78-36	-3.99-36	-7.97-36	-1.52-35	-2.87-35	-5.58-35	-1.13-34	-2.41-34	-5.42-34	-1.30-33
19	0.00+00	1.41-37	-7.48-38	-6.17-37	-1.78-36	-3.96-36	-7.80-36	-1.46-35	-2.73-35	-5.37-35	-1.13-34	-2.57-34	-6.37-34	-1.75-33
18	0.00+00	1.77-37	-4.35-38	-5.93-37	-1.76-36	-3.88-36	-7.44-36	-1.34-35	-2.44-35	-4.78-35	-1.05-34	-2.64-34	-7.57-34	-2.59-33
17	0.00+00	2.25-37	2.30-39	-5.46-37	-1.69-36	-3.66-36	-6.69-36	-1.11-35	-1.81-35	-3.29-35	-7.46-35	-2.22-34	-8.41-34	-4.41-33
16	0.00+00	2.89-37	7.21-38	-4.53-37	-1.51-36	-3.18-36	-5.14-36	-6.36-36	-4.40-36	4.76-36	2.53-35	3.67-35	-2.77-34	-8.13-33
15	0.00+00	3.76-37	1.81-37	-2.78-37	-1.14-36	-2.17-36	-2.03-36	3.44-36	2.64-35	1.04-34	3.70-34	1.53-33	1.18-32	
14	0.00+00	4.99-37	3.53-37	3.90-38	-4.27-37	-2.01-37	4.14-36	2.41-35	1.00-34	3.98-34	1.90-33	1.78-32		
13	0.00+00	6.73-37	6.26-37	5.97-37	9.13-37	3.58-36	1.65-35	7.01-35	3.00-34	1.55-33	1.57-32			
12	0.00+00	9.27-37	1.06-36	1.56-36	3.37-36	1.09-35	4.26-35	1.85-34	1.01-33	1.06-32				
11	0.00+00	1.30-36	1.75-36	3.22-36	7.93-36	2.57-35	1.04-34	5.58-34	5.85-33					
10	0.00+00	1.87-36	2.86-36	6.19-36	1.70-35	5.96-35	2.90-34	2.74-33						
9	0.00+00	2.77-36	4.79-36	1.20-35	3.80-35	1.62-34	1.28-33							
8	0.00+00	4.34-36	8.54-36	2.59-35	1.06-34	7.33-34								
7	0.00+00	7.42-36	1.74-35	7.27-35	5.58-34									
6	0.00+00	1.48-35	4.74-35	4.24-34										
5	0.00+00	3.88-35	2.68-34											
4	0.00+00	1.99-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.98-35	-8.40-35	-1.16-34	-1.57-34	-2.09-34	-2.72-34	-3.49-34	-4.40-34	-5.44-34	-6.64-34	-8.01-34	-9.57-34	-1.13-33	-1.34-33
45	-8.97-35	-1.28-34	-1.79-34	-2.48-34	-3.36-34	-4.49-34	-5.89-34	-7.61-34	-9.70-34	-1.22-33	-1.52-33	-1.89-33	-2.33-33	-2.88-33
40	-1.44-34	-2.10-34	-3.01-34	-4.28-34	-5.99-34	-8.27-34	-1.13-33	-1.52-33	-2.02-33	-2.68-33	-3.54-33	-4.67-33	-6.21-33	-8.34-33
35	-2.47-34	-3.74-34	-5.61-34	-8.34-34	-1.23-33	-1.80-33	-2.61-33	-3.79-33	-5.49-33	-8.01-33	-1.18-32	-1.79-32	-2.80-32	-4.60-32
30	-4.69-34	-7.59-34	-1.23-33	-1.99-33	-3.23-33	-5.32-33	-8.89-33	-1.52-32	-2.71-32	-5.15-32	-1.08-31	-2.70-31	-9.30-31	-7.06-30
29	-5.40-34	-8.90-34	-1.47-33	-2.45-33	-4.12-33	-7.05-33	-1.24-32	-2.26-32	-4.38-32	-9.38-32	-2.38-31	-8.32-31	-6.39-30	
28	-6.24-34	-1.05-33	-1.79-33	-3.07-33	-5.38-33	-9.67-33	-1.81-32	-3.59-32	-7.87-32	-2.04-31	-7.25-31	-5.66-30		
27	-7.25-34	-1.26-33	-2.20-33	-3.94-33	-7.26-33	-1.39-32	-2.83-32	-6.36-32	-1.69-31	-6.12-31	-4.86-30			
26	-8.48-34	-1.52-33	-2.77-33	-5.21-33	-1.02-32	-2.14-32	-4.93-32	-1.34-31	-4.98-31	-4.04-30				
25	-1.00-33	-1.86-33	-3.58-33	-7.18-33	-1.54-32	-3.63-32	-1.01-31	-3.87-31	-3.22-30					
24	-1.19-33	-2.34-33	-4.79-33	-1.05-32	-2.54-32	-7.28-32	-2.86-31	-2.45-30						
23	-1.45-33	-3.04-33	-6.79-33	-1.68-32	-4.94-32	-2.00-31	-1.76-30							
22	-1.83-33	-4.17-33	-1.05-32	-3.17-32	-1.31-31	-1.19-30								
21	-2.41-33	-6.24-33	-1.92-32	-8.12-32	-7.55-31									
20	-3.46-33	-1.09-32	-4.72-32	-4.50-31										
19	-5.70-33	-2.54-32	-2.49-31											
18	-1.22-32	-1.24-31												
17	-4.97-32													

HE + TE = 2.00+04 NE = 1.00+09 CASE B NC = 23

TOTAL RC = 9.634-13 4-3 RC = 1.522-13 4-3 EM = 6.449-25 2S RC = 2.968-13 2P RC = 6.666-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.41-03	1.35-03	5.82-04	3.01-04	1.76-04	1.11-04	7.49-05	5.28-05	3.86-05	2.91-05	2.24-05	1.77-05	1.42-05	1.15-05
45	6.06-03	1.86-03	7.98-04	4.14-04	2.41-04	1.53-04	1.03-04	7.24-05	5.30-05	3.99-05	3.08-05	2.42-05	1.94-05	1.58-05
40	8.62-03	2.64-03	1.14-03	5.88-04	3.43-04	2.17-04	1.46-04	1.03-04	7.53-05	5.67-05	4.37-05	3.44-05	2.76-05	2.25-05
35	1.28-02	3.93-03	1.69-03	8.75-04	5.10-04	3.23-04	2.17-04	1.53-04	1.12-04	8.42-05	6.49-05	5.11-05	4.10-05	3.33-05
30	2.01-02	6.15-03	2.64-03	1.37-03	7.98-04	5.05-04	3.40-04	2.39-04	1.75-04	1.31-04	1.01-04	7.97-05	6.38-05	5.19-05
29	2.21-02	6.77-03	2.91-03	1.51-03	8.78-04	5.56-04	3.74-04	2.63-04	1.92-04	1.45-04	1.11-04	8.77-05	7.02-05	5.70-05
28	2.43-02	7.46-03	3.21-03	1.66-03	9.68-04	6.12-04	4.12-04	2.90-04	2.12-04	1.59-04	1.23-04	9.66-05	7.73-05	6.28-05
27	2.69-02	8.25-03	3.54-03	1.83-03	1.07-03	6.76-04	4.55-04	3.20-04	2.34-04	1.76-04	1.36-04	1.07-04	8.53-05	6.93-05
26	2.98-02	9.12-03	3.92-03	2.03-03	1.18-03	7.48-04	5.03-04	3.54-04	2.58-04	1.94-04	1.50-04	1.18-04	9.42-05	7.65-05
25	3.30-02	1.01-02	4.34-03	2.25-03	1.31-03	8.28-04	5.57-04	3.92-04	2.86-04	2.15-04	1.66-04	1.30-04	1.04-04	8.45-05
24	3.65-02	1.12-02	4.81-03	2.49-03	1.45-03	9.18-04	6.17-04	4.34-04	3.17-04	2.38-04	1.83-04	1.44-04	1.15-04	9.34-05
23	4.03-02	1.23-02	5.30-03	2.75-03	1.60-03	1.01-03	6.81-04	4.79-04	3.50-04	2.63-04	2.02-04	1.59-04	1.27-04	1.03-04
22	4.46-02	1.37-02	5.87-03	3.04-03	1.77-03	1.12-03	7.53-04	5.30-04	3.87-04	2.91-04	2.24-04	1.76-04	1.40-04	1.14-04
21	4.93-02	1.51-02	6.49-03	3.36-03	1.96-03	1.24-03	8.32-04	5.86-04	4.27-04	3.21-04	2.47-04	1.94-04	1.55-04	1.25-04
20	5.44-02	1.67-02	7.16-03	3.71-03	2.16-03	1.37-03	9.19-04	6.46-04	4.71-04	3.54-04	2.72-04	2.13-04	1.70-04	1.37-04
19	6.00-02	1.84-02	7.90-03	4.09-03	2.38-03	1.51-03	1.01-03	7.13-04	5.20-04	3.90-04	2.99-04	2.34-04	1.86-04	1.50-04
18	6.62-02	2.03-02	8.73-03	4.52-03	2.63-03	1.67-03	1.12-03	7.87-04	5.73-04	4.30-04	3.30-04	2.58-04	2.04-04	1.63-04
17	7.33-02	2.25-02	9.68-03	5.01-03	2.92-03	1.85-03	1.24-03	8.73-04	6.36-04	4.76-04	3.64-04	2.84-04	2.23-04	1.75-04
16	8.20-02	2.52-02	1.08-02	5.62-03	3.28-03	2.07-03	1.39-03	9.78-04	7.11-04	5.32-04	4.06-04	3.14-04	2.43-04	1.80-04
15	9.31-02	2.86-02	1.23-02	6.39-03	3.73-03	2.36-03	1.59-03	1.11-03	8.08-04	6.02-04	4.57-04	3.47-04	2.53-04	
14	1.07-01	3.31-02	1.43-02	7.42-03	4.33-03	2.74-03	1.84-03	1.29-03	9.36-04	6.93-04	5.17-04	3.71-04		
13	1.26-01	3.90-02	1.69-02	8.79-03	5.14-03	3.26-03	2.19-03	1.53-03	1.10-03	8.05-04	5.67-04			
12	1.51-01	4.68-02	2.04-02	1.06-02	6.25-03	3.97-03	2.66-03	1.86-03	1.32-03	9.10-04				
11	1.83-01	5.73-02	2.51-02	1.32-02	7.80-03	4.96-03	3.33-03	2.29-03	1.54-03					
10	2.26-01	7.16-02	3.18-02	1.69-02	1.01-02	6.42-03	4.26-03	2.79-03						
9	2.85-01	9.21-02	4.17-02	2.25-02	1.35-02	8.58-03	5.43-03							
8	3.74-01	1.24-01	5.75-02	3.16-02	1.90-02	1.15-02								
7	5.21-01	1.77-01	8.49-02	4.71-02	2.71-02									
6	7.97-01	2.78-01	1.36-01	7.27-02										
5	1.39+00	4.92-01	2.34-01											
4	2.93+00	1.00+00												
3	8.36+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	9.51-06	7.93-06	6.69-06	5.69-06	4.88-06	4.21-06	3.67-06	3.21-06	2.82-06	2.50-06	2.22-06	1.98-06	1.78-06	1.60-06
45	1.30-05	1.09-05	9.16-06	7.79-06	6.68-06	5.77-06	5.02-06	4.39-06	3.86-06	3.42-06	3.04-06	2.71-06	2.43-06	2.18-06
40	1.85-05	1.54-05	1.30-05	1.11-05	9.48-06	8.19-06	7.12-06	6.23-06	5.47-06	4.84-06	4.30-06	3.83-06	3.43-06	3.08-06
35	2.75-05	2.29-05	1.93-05	1.64-05	1.40-05	1.21-05	1.05-05	9.19-06	8.07-06	7.12-06	6.31-06	5.61-06	5.00-06	4.47-06
30	4.27-05	3.56-05	2.99-05	2.54-05	2.17-05	1.87-05	1.62-05	1.41-05	1.23-05	1.08-05	9.50-06	8.31-06	7.17-06	5.85-06
29	4.70-05	3.91-05	3.29-05	2.79-05	2.38-05	2.05-05	1.78-05	1.54-05	1.35-05	1.18-05	1.02-05	8.81-06	7.15-06	
28	5.17-05	4.30-05	3.62-05	3.07-05	2.62-05	2.25-05	1.95-05	1.69-05	1.47-05	1.27-05	1.09-05	8.80-06		
27	5.70-05	4.74-05	3.98-05	3.37-05	2.88-05	2.47-05	2.13-05	1.84-05	1.59-05	1.35-05	1.09-05			
26	6.29-05	5.23-05	4.39-05	3.71-05	3.16-05	2.71-05	2.33-05	1.99-05	1.69-05	1.35-05				
25	6.95-05	5.77-05	4.84-05	4.09-05	3.47-05	2.96-05	2.53-05	2.13-05	1.70-05					
24	7.67-05	6.37-05	5.33-05	4.49-05	3.80-05	3.22-05	2.70-05	2.14-05						
23	8.45-05	7.00-05	5.85-05	4.91-05	4.13-05	3.44-05	2.71-05							
22	9.30-05	7.69-05	6.40-05	5.34-05	4.41-05	3.46-05								
21	1.02-04	8.42-05	6.95-05	5.70-05	4.43-05									
20	1.12-04	9.13-05	7.42-05	5.72-05										
19	1.21-04	9.74-05	7.45-05											
18	1.30-04	9.81-05												
17	1.31-04													

HE + TE = 2.00+04 NE = 1.00+09 CASE B NC = 23

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	-9.55-40	-4.10-38	-1.47-37	-3.81-37	-8.33-37	-1.63-36	-2.96-36	-5.06-36	-8.21-36	-1.28-35	-1.91-35	-2.75-35	-3.80-35
45	0.00+00	-1.35-39	-5.66-38	-2.04-37	-5.30-37	-1.17-36	-2.30-36	-4.20-36	-7.22-36	-1.18-35	-1.86-35	-2.80-35	-4.08-35	-5.74-35
40	0.00+00	-1.94-39	-8.13-38	-2.94-37	-7.68-37	-1.70-36	-3.38-36	-6.24-36	-1.08-35	-1.80-35	-2.86-35	-4.39-35	-6.51-35	-9.32-35
35	0.00+00	-2.75-39	-1.22-37	-4.44-37	-1.17-36	-2.62-36	-5.27-36	-9.85-36	-1.74-35	-2.94-35	-4.78-35	-7.52-35	-1.14-34	-1.69-34
30	0.00+00	-3.19-39	-1.92-37	-7.07-37	-1.89-36	-4.29-36	-8.80-36	-1.68-35	-3.05-35	-5.31-35	-8.93-35	-1.46-34	-2.33-34	-3.61-34
29	0.00+00	-2.99-39	-2.11-37	-7.81-37	-2.09-36	-4.77-36	-9.84-36	-1.89-35	-3.46-35	-6.06-35	-1.03-34	-1.70-34	-2.74-34	-4.32-34
28	0.00+00	-2.55-39	-2.32-37	-8.63-37	-2.32-36	-5.32-36	-1.10-35	-2.13-35	-3.93-35	-6.96-35	-1.19-34	-2.00-34	-3.27-34	-5.24-34
27	0.00+00	-1.74-39	-2.55-37	-9.55-37	-2.58-36	-5.95-36	-1.24-35	-2.42-35	-4.49-35	-8.04-35	-1.40-34	-2.37-34	-3.94-34	-6.43-34
26	0.00+00	-3.84-40	-2.80-37	-1.06-36	-2.87-36	-6.66-36	-1.40-35	-2.75-35	-5.15-35	-9.33-35	-1.64-34	-2.84-34	-4.81-34	-8.03-34
25	0.00+00	1.80-39	-3.08-37	-1.17-36	-3.20-36	-7.45-36	-1.58-35	-3.13-35	-5.94-35	-1.09-34	-1.95-34	-3.43-34	-5.95-34	-1.02-33
24	0.00+00	5.22-39	-3.36-37	-1.29-36	-3.56-36	-8.35-36	-1.78-35	-3.57-35	-6.86-35	-1.28-34	-2.33-34	-4.20-34	-7.48-34	-1.33-33
23	0.00+00	1.17-38	-3.59-37	-1.41-36	-3.90-36	-9.23-36	-1.99-35	-4.04-35	-7.88-35	-1.50-34	-2.79-34	-5.16-34	-9.50-34	-1.75-33
22	0.00+00	2.00-38	-3.85-37	-1.53-36	-4.30-36	-1.03-35	-2.23-35	-4.60-35	-9.14-35	-1.77-34	-3.40-34	-6.48-34	-1.24-33	-2.41-33
21	0.00+00	3.22-38	-4.07-37	-1.66-36	-4.70-36	-1.13-35	-2.50-35	-5.23-35	-1.06-34	-2.11-34	-4.18-34	-8.29-34	-1.67-33	-3.46-33
20	0.00+00	4.98-38	-4.21-37	-1.77-36	-5.08-36	-1.24-35	-2.78-35	-5.92-35	-1.23-34	-2.53-34	-5.19-34	-1.08-33	-2.33-33	-5.27-33
19	0.00+00	7.48-38	-4.24-37	-1.86-36	-5.43-36	-1.34-35	-3.06-35	-6.66-35	-1.43-34	-3.04-34	-6.56-34	-1.46-33	-3.43-33	-8.79-33
18	0.00+00	1.09-37	-4.12-37	-1.93-36	-5.72-36	-1.44-35	-3.33-35	-7.45-35	-1.65-34	-3.69-34	-8.49-34	-2.06-33	-5.48-33	-1.71-32
17	0.00+00	1.56-37	-3.82-37	-1.96-36	-5.95-36	-1.52-35	-3.60-35	-8.31-35	-1.92-34	-4.57-34	-1.14-33	-3.14-33	-1.01-32	-4.45-32
16	0.00+00	2.19-37	-3.33-37	-1.96-36	-6.15-36	-1.60-35	-3.88-35	-9.31-35	-2.28-34	-5.88-34	-1.66-33	-5.52-33	-2.51-32	-2.48-31
15	0.00+00	3.02-37	-2.63-37	-1.95-36	-6.34-36	-1.69-35	-4.22-35	-1.06-34	-2.81-34	-8.15-34	-2.78-33	-1.30-32	-1.32-31	
14	0.00+00	4.14-37	-1.65-37	-1.92-36	-6.57-36	-1.80-35	-4.67-35	-1.25-34	-3.70-34	-1.29-33	-6.18-33	-6.46-32		
13	0.00+00	5.71-37	-1.70-38	-1.84-36	-6.78-36	-1.92-35	-5.22-35	-1.54-34	-5.40-34	-2.64-33	-2.83-32			
12	0.00+00	7.99-37	2.30-37	-1.61-36	-6.71-36	-1.98-35	-5.66-35	-1.90-34	-9.15-34	-1.01-32				
11	0.00+00	1.15-36	6.74-37	-9.76-37	-5.64-36	-1.70-35	-4.72-35	-1.77-34	-1.73 33					
10	0.00+00	1.71-36	1.52-36	6.51-37	-1.40-36	2.69-37	5.97-35	1.13-33						
9	0.00+00	2.67-36	3.22-36	4.83-36	1.34-35	9.13-35	1.40-33							
8	0.00+00	4.38-36	6.83-36	1.64-35	7.43-35	9.20-34								
7	0.00+00	7.74-36	1.56-35	5.73-35	5.41-34									
6	0.00+00	1.55-35	4.40-35	3.51-34										
5	0.00+00	4.03-35	2.40-34											
4	0.00+00	2.01-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.07-35	-6.48-35	-7.97-35	-9.47-35	-1.09-34	-1.23-34	-1.37-34	-1.49-34	-1.58-34	-1.68-34	-1.78-34	-1.88-34	-1.96-34	-2.04-34
45	-7.75-35	-1.01-34	-1.26-34	-1.53-34	-1.80-34	-2.09-34	-2.37-34	-2.67-34	-2.92-34	-3.23-34	-3.57-34	-3.93-34	-4.34-34	-4.79-34
40	-1.29-34	-1.71-34	-2.20-34	-2.75-34	-3.35-34	-4.02-34	-4.75-34	-5.59-34	-6.45-34	-7.56-34	-8.91-34	-1.06-33	-1.27-33	-1.55-33
35	-2.41-34	-3.33-34	-4.47-34	-5.84-34	-7.51-34	-9.55-34	-1.21-33	-1.54-33	-1.94-33	-2.53-33	-3.36-33	-4.62-33	-6.62-33	-1.00-32
30	-5.46-34	-8.05-34	-1.16-33	-1.66-33	-2.36-33	-3.38-33	-4.93-33	-7.43-33	-1.16-32	-1.98-32	-3.78-32	-8.65-32	-2.76-31	-1.97-30
29	-6.64-34	-9.99-34	-1.48-33	-2.17-33	-3.18-33	-4.73-33	-7.25-33	-1.16-32	-1.98-32	-3.81-32	-8.80-32	-2.83-31	-2.03-30	
28	-8.21-34	-1.26-33	-1.92-33	-2.90-33	-4.43-33	-6.93-33	-1.13-32	-1.98-32	-3.80-32	-8.84-32	-2.87-31	-2.06-30		
27	-1.03-33	-1.63-33	-2.56-33	-4.03-33	-6.45-33	-1.07-32	-1.91-32	-3.77-32	-8.77-32	-2.87-31	-2.08-30			
26	-1.32-33	-2.16-33	-3.52-33	-5.83-33	-9.95-33	-1.80-32	-3.62-32	-8.64-32	-2.83-31	-2.07-30				
25	-1.74-33	-2.95-33	-5.06-33	-8.91-33	-1.66-32	-3.40-32	-8.23-32	-2.75-31	-2.03-30					
24	-2.35-33	-4.19-33	-7.66-33	-1.47-32	-3.09-32	-7.64-32	-2.59-31	-1.91-30						
23	-3.26-33	-6.21-33	-1.24-32	-2.68-32	-6.80-32	-2.36-31	-1.78-30							
22	-4.79-33	-9.95-33	-2.24-32	-5.87-32	-2.09-31	-1.62-30								
21	-7.51-33	-1.76-32	-4.81-32	-1.77-31	-1.41-30									
20	-1.30-32	-3.69-32	-1.42-31	-1.17-30										
19	-2.62-32	-1.05-31	-9.07-31											
18	-7.19-32	-6.49-31												
17	-4.22-31													

HE + TE = 2.00+04 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 1.019-12 4-3 RC = 1.483-13 4-3 EM = 6.287-25 2S RC = 3.197-13 2P RC = 6.989-13

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.53-03	1.39-03	5.98-04	3.10-04	1.81-04	1.14-04	7.70-05	5.43-05	3.97-05	2.99-05	2.31-05	1.82-05	1.46-05	1.18-05
45	6.24-03	1.91-03	8.22-04	4.26-04	2.48-04	1.57-04	1.06-04	7.46-05	5.45-05	4.11-05	3.17-05	2.50-05	2.00-05	1.63-05
40	8.91-03	2.73-03	1.17-03	6.08-04	3.55-04	2.25-04	1.51-04	1.06-04	7.78-05	5.86-05	4.52-05	3.56-05	2.85-05	2.32-05
35	1.33-02	4.09-03	1.76-03	9.11-04	5.31-04	3.36-04	2.26-04	1.59-04	1.17-04	8.77-05	6.76-05	5.32-05	4.27-05	3.47-05
30	2.13-02	6.53-03	2.80-03	1.45-03	8.47-04	5.36-04	3.60-04	2.54-04	1.85-04	1.39-04	1.08-04	8.46-05	6.78-05	5.51-05
29	2.36-02	7.23-03	3.11-03	1.61-03	9.38-04	5.94-04	3.99-04	2.81-04	2.05-04	1.54-04	1.19-04	9.37-05	7.50-05	6.09-05
28	2.62-02	8.04-03	3.45-03	1.79-03	1.04-03	6.59-04	4.43-04	3.12-04	2.28-04	1.72-04	1.32-04	1.04-04	8.32-05	6.76-05
27	2.92-02	8.97-03	3.85-03	1.99-03	1.16-03	7.35-04	4.94-04	3.48-04	2.54-04	1.91-04	1.47-04	1.16-04	9.27-05	7.53-05
26	3.27-02	1.00-02	4.31-03	2.23-03	1.30-03	8.23-04	5.53-04	3.89-04	2.84-04	2.14-04	1.65-04	1.30-04	1.04-04	8.41-05
25	3.68-02	1.13-02	4.84-03	2.51-03	1.46-03	9.25-04	6.21-04	4.37-04	3.19-04	2.40-04	1.85-04	1.45-04	1.16-04	9.43-05
24	4.15-02	1.27-02	5.47-03	2.83-03	1.65-03	1.04-03	7.01-04	4.93-04	3.60-04	2.71-04	2.08-04	1.64-04	1.31-04	1.06-04
23	4.70-02	1.44-02	6.19-03	3.20-03	1.87-03	1.18-03	7.93-04	5.58-04	4.07-04	3.06-04	2.36-04	1.85-04	1.48-04	1.20-04
22	5.35-02	1.64-02	7.04-03	3.64-03	2.12-03	1.34-03	9.01-04	6.34-04	4.63-04	3.47-04	2.67-04	2.10-04	1.67-04	1.36-04
21	6.11-02	1.87-02	8.03-03	4.16-03	2.42-03	1.53-03	1.03-03	7.23-04	5.27-04	3.96-04	3.04-04	2.39-04	1.90-04	1.54-04
20	6.98-02	2.14-02	9.18-03	4.75-03	2.77-03	1.75-03	1.17-03	8.26-04	6.02-04	4.51-04	3.47-04	2.72-04	2.16-04	1.75-04
19	8.01-02	2.45-02	1.05-02	5.45-03	3.17-03	2.01-03	1.35-03	9.46-04	6.89-04	5.17-04	3.97-04	3.10-04	2.46-04	1.98-04
18	9.20-02	2.82-02	1.21-02	6.26-03	3.64-03	2.30-03	1.54-03	1.08-03	7.89-04	5.91-04	4.53-04	3.54-04	2.80-04	2.23-04
17	1.06-01	3.24-02	1.39-02	7.18-03	4.18-03	2.64-03	1.77-03	1.24-03	9.03-04	6.76-04	5.17-04	4.02-04	3.16-04	2.47-04
16	1.21-01	3.71-02	1.59-02	8.22-03	4.78-03	3.02-03	2.02-03	1.42-03	1.03-03	7.69-04	5.86-04	4.52-04	3.49-04	2.57-04
15	1.38-01	4.23-02	1.81-02	9.37-03	5.45-03	3.44-03	2.30-03	1.61-03	1.17-03	8.68-04	6.56-04	4.98-04	3.62-04	
14	1.56-01	4.79-02	2.06-02	1.06-02	6.17-03	3.89-03	2.60-03	1.82-03	1.31-03	9.69-04	7.21-04	5.15-04		
13	1.77-01	5.43-02	2.33-02	1.20-02	6.99-03	4.40-03	2.94-03	2.05-03	1.47-03	1.06-03	7.46-04			
12	2.03-01	6.21-02	2.67-02	1.38-02	7.99-03	5.03-03	3.34-03	2.31-03	1.63-03	1.12-03				
11	2.38-01	7.30-02	3.13-02	1.62-02	9.38-03	5.88-03	3.89-03	2.65-03	1.76-03					
10	2.89-01	8.89-02	3.82-02	1.97-02	1.14-02	7.13-03	4.65-03	2.99-03						
9	3.65-01	1.13-01	4.85-02	2.51-02	1.45-02	8.94-03	5.51-03							
8	4.79-01	1.49-01	6.45-02	3.34-02	1.92-02	1.12-02								
7	6.57-01	2.06-01	9.06-02	4.70-02	2.58-02									
6	9.68-01	3.08-01	1.37-01	6.91-02										
5	1.61+00	5.16-01	2.26-01											
4	3.23+00	1.00+00												
3	8.83+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	9.77-06	8.15-06	6.87-06	5.85-06	5.01-06	4.33-06	3.77-06	3.30-06	2.90-06	2.57-06	2.28-06	2.04-06	1.83-06	1.64-06
45	1.34-05	1.12-05	9.44-06	8.02-06	6.88-06	5.94-06	5.17-06	4.52-06	3.98-06	3.52-06	3.13-06	2.79-06	2.50-06	2.25-06
40	1.91-05	1.60-05	1.34-05	1.14-05	9.80-06	8.46-06	7.36-06	6.43-06	5.66-06	5.00-06	4.44-06	3.96-06	3.54-06	3.18-06
35	2.86-05	2.38-05	2.01-05	1.71-05	1.46-05	1.26-05	1.10-05	9.57-06	8.40-06	7.41-06	6.57-06	5.84-06	5.21-06	4.66-06
30	4.54-05	3.78-05	3.18-05	2.70-05	2.31-05	1.99-05	1.72-05	1.50-05	1.31-05	1.15-05	1.01-05	8.82-06	7.61-06	6.21-06
29	5.02-05	4.18-05	3.51-05	2.98-05	2.55-05	2.19-05	1.90-05	1.65-05	1.44-05	1.26-05	1.09-05	9.41-06	7.64-06	
28	5.57-05	4.63-05	3.89-05	3.30-05	2.82-05	2.42-05	2.09-05	1.82-05	1.58-05	1.37-05	1.17-05	9.47-06		
27	6.20-05	5.15-05	4.33-05	3.67-05	3.13-05	2.69-05	2.32-05	2.00-05	1.72-05	1.47-05	1.18-05			
26	6.92-05	5.75-05	4.83-05	4.09-05	3.48-05	2.98-05	2.56-05	2.19-05	1.86-05	1.49-05				
25	7.75-05	6.44-05	5.40-05	4.56-05	3.88-05	3.31-05	2.82-05	2.37-05	1.89-05					
24	8.71-05	7.23-05	6.05-05	5.10-05	4.32-05	3.66-05	3.06-05	2.43-05						
23	9.82-05	8.14-05	6.80-05	5.71-05	4.80-05	3.99-05	3.14-05							
22	1.11-04	9.18-05	7.63-05	6.36-05	5.25-05	4.11-05								
21	1.26-04	1.03-04	8.54-05	7.00-05	5.43-05									
20	1.42-04	1.16-04	9.42-05	7.26-05										
19	1.60-04	1.28-04	9.81-05											
18	1.77-04	1.34-04												
17	1.85-04													

HE + TE = 2.00+04 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.18-32	-9.04-40	-4.25-38	-1.51-37	-3.86-37	-8.31-37	-1.60-36	-2.82-36	-4.60-36	-6.97-36	-9.72-36	-1.24-35	-1.46-35	-1.59-35
45	4.37-32	-1.32-39	-5.89-38	-2.10-37	-5.39-37	-1.17-36	-2.26-36	-4.00-36	-6.59-36	-1.01-35	-1.42-35	-1.84-35	-2.19-35	-2.43-35
40	6.23-32	-2.04-39	-8.52-38	-3.05-37	-7.87-37	-1.71-36	-3.34-36	-5.99-36	-9.98-36	-1.55-35	-2.21-35	-2.92-35	-3.54-35	-4.02-35
35	9.33-32	-3.34-39	-1.30-37	-4.68-37	-1.22-36	-2.68-36	-5.29-36	-9.62-36	-1.63-35	-2.58-35	-3.77-35	-5.10-35	-6.39-35	-7.52-35
30	1.49-31	-5.88-39	-2.12-37	-7.71-37	-2.03-36	-4.54-36	-9.15-36	-1.70-35	-2.97-35	-4.84-35	-7.36-35	-1.04-34	-1.37-34	-1.71-34
29	1.65-31	-6.63-39	-2.36-37	-8.61-37	-2.28-36	-5.11-36	-1.04-35	-1.94-35	-3.41-35	-5.60-35	-8.60-35	-1.23-34	-1.64-34	-2.08-34
28	1.83-31	-7.48-39	-2.64-37	-9.66-37	-2.56-36	-5.79-36	-1.18-35	-2.23-35	-3.94-35	-6.54-35	-1.02-34	-1.47-34	-2.00-34	-2.58-34
27	2.05-31	-8.45-39	-2.97-37	-1.09-36	-2.90-36	-6.59-36	-1.35-35	-2.57-35	-4.59-35	-7.71-35	-1.21-34	-1.78-34	-2.46-34	-3.25-34
26	2.30-31	-9.53-39	-3.34-37	-1.23-36	-3.30-36	-7.54-36	-1.56-35	-2.99-35	-5.40-35	-9.18-35	-1.46-34	-2.19-34	-3.09-34	-4.19-34
25	2.59-31	-1.07-38	-3.79-37	-1.40-36	-3.77-36	-8.68-36	-1.81-35	-3.51-35	-6.41-35	-1.11-34	-1.80-34	-2.74-34	-3.96-34	-5.52-34
24	2.93-31	-1.20-38	-4.31-37	-1.60-36	-4.34-36	-1.01-35	-2.12-35	-4.16-35	-7.70-35	-1.35-34	-2.24-34	-3.49-34	-5.20-34	-7.51-34
23	3.34-31	-1.32-38	-4.91-37	-1.84-36	-5.02-36	-1.17-35	-2.50-35	-4.97-35	-9.36-35	-1.67-34	-2.84-34	-4.56-34	-7.02-34	-1.06-33
22	3.83-31	-1.43-38	-5.63-37	-2.12-36	-5.84-36	-1.38-35	-2.98-35	-6.02-35	-1.15-34	-2.11-34	-3.68-34	-6.12-34	-9.82-34	-1.56-33
21	4.41-31	-1.48-38	-6.47-37	-2.46-36	-6.84-36	-1.64-35	-3.58-35	-7.37-35	-1.45-34	-2.72-34	-4.90-34	-8.48-34	-1.43-33	-2.43-33
20	5.13-31	-1.34-38	-7.42-37	-2.85-36	-8.02-36	-1.95-35	-4.34-35	-9.13-35	-1.84-34	-3.57-34	-6.71-34	-1.22-33	-2.21-33	-4.09-33
19	6.01-31	-1.01-38	-8.54-37	-3.33-36	-9.48-36	-2.34-35	-5.32-35	-1.15-34	-2.39-34	-4.84-34	-9.57-34	-1.86-33	-3.68-33	-7.73-33
18	7.10-31	-2.39-39	-9.78-37	-3.88-36	-1.12-35	-2.83-35	-6.60-35	-1.47-34	-3.18-34	-6.79-34	-1.43-33	-3.05-33	-6.84-33	-1.75-32
17	8.48-31	1.33-38	-1.11-36	-4.51-36	-1.33-35	-3.43-35	-8.25-35	-1.91-34	-4.36-34	-9.93-34	-2.30-33	-5.55-33	-1.51-32	-5.44-32
16	1.02-30	4.28-38	-1.24-36	-5.26-36	-1.57-35	-4.17-35	-1.04-34	-2.53-34	-6.16-34	-1.54-33	-4.04-33	-1.19-32	-4.58-32	-3.71-31
15	1.25-30	9.53-38	-1.35-36	-5.90-36	-1.84-35	-5.05-35	-1.32-34	-3.42-34	-9.11-34	-2.58-33	-8.28-33	-3.45-32	-3.00-31	
14	1.56-30	1.84-37	-1.41-36	-6.55-36	-2.12-35	-6.07-35	-1.69-34	-4.77-34	-1.44-33	-4.98-33	-2.26-32	-2.14-31		
13	1.97-30	3.28-37	-1.38-36	-7.08-36	-2.40-35	-7.27-35	-2.19-34	-6.99-34	-2.27-33	-1.26-32	-1.30-31			
12	2.54-30	5.47-37	-1.26-36	-7.52-36	-2.71-35	-8.85-35	-2.98-34	-1.15-33	-3.92-33	-6.56-32				
11	3.37-30	8.77-37	-1.03-36	-8.01-36	-3.14-35	-1.14-34	-4.58-34	-2.45-33	-2.83-32					
10	4.61-30	1.39-36	-6.38-37	-8.73-36	-3.88-35	-1.66-34	-9.20-34	-1.09-32						
9	6.57-30	2.24-36	1.36-37	-9.58-36	-5.23-35	-3.02-34	-3.62-33							
8	9.85-30	3.82-36	2.03-36	-9.17-36	-7.45-35	-8.61-34								
7	1.59-29	7.11-36	7.60-36	2.47-36	-1.39-34									
6	2.86-29	1.51-35	2.87-35	1.64-34										
5	6.11-29	4.09-35	1.83-34											
4	1.83-28	2.03-34												
3	1.33-27													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.61-35	-1.53-35	-1.39-35	-1.05-35	-6.39-36	-4.32-37	6.49-36	1.52-35	2.61-35	3.95-35	5.64-35	7.73-35	1.03-34	1.36-34
45	-2.52-35	-2.46-35	-2.24-35	-1.85-35	-1.28-35	-3.98-36	6.62-36	2.05-35	3.86-35	6.21-35	9.29-35	1.33-34	1.86-34	2.57-34
40	-4.30-35	-4.36-35	-4.17-35	-3.71-35	-2.93-35	-1.98-35	1.35-36	2.56-35	5.96-35	1.07-34	1.74-34	2.70-34	4.09-34	6.16-34
35	-8.40-35	-8.98-35	-9.21-35	-9.01-35	-8.26-35	-6.33-35	-3.56-35	1.03-35	8.52-35	2.07-34	4.11-34	7.61-34	1.39-33	2.60-33
30	-2.05-34	-2.39-34	-2.72-34	-3.05-34	-3.37-34	-3.49-34	-3.56-34	-3.19-34	-1.77-34	2.42-34	1.52-33	5.86-33	2.65-32	2.45-31
29	-2.55-34	-3.04-34	-3.57-34	-4.15-34	-4.80-34	-5.33-34	-5.97-34	-6.35-34	-5.65-34	-1.13-34	2.01-33	1.36-32	1.48-31	
28	-3.23-34	-3.96-34	-4.80-34	-5.82-34	-7.11-34	-8.50-34	-1.06-33	-1.32-33	-1.61-33	-1.65-33	1.52-33	5.81-32		
27	-4.18-34	-5.28-34	-6.66-34	-8.48-34	-1.10-33	-1.44-33	-2.01-33	-3.02-33	-5.01-33	-1.01-32	-2.67-32			
26	-5.54-34	-7.27-34	-9.60-34	-1.30-33	-1.82-33	-2.64-33	-4.30-33	-8.15-33	-2.06-32	-1.10-31				
25	-7.57-34	-1.04-33	-1.45-33	-2.10-33	-3.25-33	-5.44-33	-1.10-32	-3.02-32	-1.80-31					
24	-1.07-33	-1.55-33	-2.33-33	-3.71-33	-6.56-33	-1.35-32	-3.91-32	-2.49-31						
23	-1.59-33	-2.47-33	-4.06-33	-7.37-33	-1.59-32	-4.67-32	-3.09-31							
22	-2.51-33	-4.26-33	-7.96-33	-1.76-32	-5.38-32	-3.59-31								
21	-4.30-33	-8.28-33	-1.88-32	-5.88-32	-4.01-31									
20	-8.18-33	-1.91-32	-6.12-32	-4.29-31										
19	-1.88-32	-6.20-32	-4.46-31											
18	-5.99-32	-4.44-31												
17	-4.19-31													

HE + TE = 2.00+04 NE = 1.00+11 CASE B NC = 20

TOTAL RC = 1.125-12 4-3 RC = 1.541-13 4-3 EM = 6.533-25 2S RC = 3.423-13 2P RC = 7.828-13

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	4.36-03	1.34-03	5.76-04	2.98-04	1.74-04	1.10-04	7.41-05	5.22-05	3.82-05	2.88-05	2.22-05	1.75-05	1.40-05	1.14-05
45	6.00-03	1.84-03	7.92-04	4.10-04	2.39-04	1.52-04	1.02-04	7.18-05	5.25-05	3.95-05	3.05-05	2.40-05	1.93-05	1.57-05
40	8.58-03	2.63-03	1.13-03	5.86-04	3.42-04	2.16-04	1.46-04	1.03-04	7.50-05	5.65-05	4.36-05	3.43-05	2.75-05	2.24-05
35	1.29-02	3.95-03	1.70-03	8.79-04	5.13-04	3.25-04	2.18-04	1.54-04	1.12-04	8.46-05	6.53-05	5.14-05	4.12-05	3.35-05
30	2.06-02	6.33-03	2.72-03	1.41-03	8.20-04	5.19-04	3.49-04	2.46-04	1.80-04	1.35-04	1.04-04	8.20-05	6.57-05	5.34-05
29	2.29-02	7.02-03	3.01-03	1.56-03	9.10-04	5.76-04	3.87-04	2.73-04	1.99-04	1.50-04	1.16-04	9.09-05	7.28-05	5.91-05
28	2.55-02	7.81-03	3.36-03	1.74-03	1.01-03	6.41-04	4.31-04	3.04-04	2.22-04	1.67-04	1.29-04	1.01-04	8.09-05	6.57-05
27	2.85-02	8.73-03	3.75-03	1.94-03	1.13-03	7.16-04	4.82-04	3.39-04	2.48-04	1.86-04	1.44-04	1.13-04	9.03-05	7.34-05
26	3.20-02	9.81-03	4.2 -03	2.18-03	1.27-03	8.04-04	5.41-04	3.81-04	2.78-04	2.09-04	1.61-04	1.27-04	1.01-04	8.22-05
25	3.61-02	1.11-02	4.75-03	2.46-03	1.43-03	9.07-04	6.09-04	4.29-04	3.13-04	2.35-04	1.81-04	1.43-04	1.14-04	9.25-05
24	4.09-02	1.25-02	5.38-03	2.79-03	1.62-03	1.03-03	6.90-04	4.86-04	3.55-04	2.67-04	2.05-04	1.61-04	1.29-04	1.05-04
23	4.66-02	1.43-02	6.14-03	3.18-03	1.85-03	1.17-03	7.86-04	5.53-04	4.04-04	3.03-04	2.33-04	1.83-04	1.46-04	1.19-04
22	5.34-02	1.64-02	7.03-03	3.64-03	2.12-03	1.34-03	9.01-04	6.34-04	4.62-04	3.47-04	2.67-04	2.10-04	1.67-04	1.35-04
21	6.17-02	1.89-02	8.11-03	4.20-03	2.44-03	1.55-03	1.04-03	7.30-04	5.32-04	4.00-04	3.07-04	2.41-04	1.92-04	1.55-04
20	7.16-02	2.19-02	9.41-03	4.87-03	2.84-03	1.79-03	1.20-03	8.46-04	6.17-04	4.63-04	3.55-04	2.78-04	2.22-04	1.79-04
19	8.37-02	2.57-02	1.10-02	5.69-03	3.31-03	2.09-03	1.41-03	9.88-04	7.19-04	5.39-04	4.14-04	3.24-04	2.57-04	2.07-04
18	9.86-02	3.02-02	1.30-02	6.70-03	3.90-03	2.46-03	1.65-03	1.16-03	8.45-04	6.33-04	4.85-04	3.78-04	2.99-04	2.39-04
17	1.17-01	3.59-02	1.54-02	7.95-03	4.63-03	2.92-03	1.96-03	1.37-03	9.99-04	7.47-04	5.71-04	4.44-04	3.48-04	2.73-04
16	1.40-01	4.29-02	1.84-02	9.50-03	5.53-03	3.49-03	2.34-03	1.64-03	1.19-03	8.86-04	6.75-04	5.21-04	4.02-04	2.96-04
15	1.69-01	5.16-02	2.21-02	1.14-02	6.64-03	4.19-03	2.80-03	1.96-03	1.42-03	1.06-03	7.97-04	6.05-04	4.39-04	
14	2.04-01	6.24-02	2.67-02	1.38-02	8.02-03	5.05-03	3.37-03	2.35-03	1.70-03	1.25-03	9.30-04	6.64-04		
13	2.47-01	7.55-02	3.23-02	1.67-02	9.68-03	6.09-03	4.06-03	2.82-03	2.02-03	1.46-03	1.02-03			
12	2.97-01	9.09-02	3.89-02	2.00-02	1.16-02	7.28-03	4.84-03	3.34-03	2.35-03	1.60-03				
11	3.53-01	1.08-01	4.62-02	2.37-02	1.37-02	8.58-03	5.66-03	3.84-03	2.54-03					
10	4.14-01	1.26-01	5.40-02	2.77-02	1.60-02	9.91-03	6.43-03	4.11-03						
9	4.87-01	1.48-01	6.33-02	3.24-02	1.86-02	1.13-02	6.93-03							
8	5.99-01	1.83-01	7.77-02	3.96-02	2.23-02	1.28-02								
7	7.93-01	2.42-01	1.02-01	5.15-02	2.74-02									
6	1.14+00	3.47-01	1.46-01	6.99-02										
5	1.83+00	5.54-01	2.24-01											
4	3.54+00	1.00+00												
3	9.23+00													

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	9.41-06	7.85-06	6.62-06	5.63-06	4.83-06	4.17-06	3.63-06	3.17-06	2.79-06	2.47-06	2.20-06	1.96-06	1.76-06	1.58-06
45	1.29-05	1.08-05	9.09-06	7.73-06	6.63-06	5.72-06	4.98-06	4.36-06	3.83-06	3.39-06	3.01-06	2.69-06	2.41-06	2.16-06
40	1.84-05	1.54-05	1.30-05	1.10-05	9.44-06	8.15-06	7.09-06	6.20-06	5.45-06	4.82-06	4.28-06	3.81-06	3.41-06	3.06-06
35	2.76-05	2.30-05	1.94-05	1.65-05	1.41-05	1.22-05	1.06-05	9.23-06	8.11-06	7.16-06	6.34-06	5.64-06	5.03-06	4.50-06
30	4.39-05	3.66-05	3.08-05	2.61-05	2.24-05	1.93-05	1.67-05	1.45-05	1.27-05	1.11-05	9.77-06	8.55-06	7.38-06	6.02-06
29	4.87-05	4.05-05	3.41-05	2.89-05	2.47-05	2.13-05	1.84-05	1.60-05	1.40-05	1.22-05	1.06-05	9.13-06	7.41-06	
28	5.41-05	4.50-05	3.79-05	3.21-05	2.74-05	2.36-05	2.04-05	1.77-05	1.53-05	1.33-05	1.14-05	9.21-06		
27	6.04-05	5.02-05	4.22-05	3.57-05	3.05-05	2.62-05	2.26-05	1.95-05	1.68-05	1.43-05	1.15-05			
26	6.76-05	5.62-05	4.72-05	3.99-05	3.40-05	2.91-05	2.50-05	2.14-05	1.82-05	1.46-05				
25	7.60-05	6.32-05	5.30-05	4.47-05	3.80-05	3.24-05	2.76-05	2.33-05	1.86-05					
24	8.59-05	7.13-05	5.96-05	5.03-05	4.26-05	3.60-05	3.02-05	2.39-05						
23	9.74-05	8.07-05	6.74-05	5.66-05	4.75-05	3.95-05	3.12-05							
22	1.11-04	9.17-05	7.63-05	6.36-05	5.25-05	4.11-05								
21	1.27-04	1.04-04	8.62-05	7.06-05	5.49-05									
20	1.45-04	1.19-04	9.65-05	7.43-05										
19	1.67-04	1.34-04	1.02-04											
18	1.89-04	1.43-04												
17	2.04-04													

HE + TE = 2.00+04 NE = 1.00+11 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.29-32	-2.48-39	-4.36-38	-1.44-37	-3.53-37	-7.24-37	-1.27-36	-1.89-36	-2.26-36	-2.11-36	-1.34-36	2.88-38	1.96-36	4.45-36
45	4.51-32	-3.49-39	-6.05-38	-2.01-37	-4.94-37	-1.02-36	-1.80-36	-2.69-36	-3.27-36	-3.11-36	-2.06-36	-1.32-37	2.64-36	6.29-36
40	6.44-32	-5.17-39	-8.76-38	-2.92-37	-7.22-37	-1.50-36	-2.68-36	-4.05-36	-5.00-36	-4.87-36	-3.41-36	-5.86-37	3.62-36	9.32-36
35	9.64-32	-8.12-39	-1.34-37	-4.49-37	-1.12-36	-2.35-36	-4.26-36	-6.56-36	-8.28-36	-8.37-36	-6.32-36	-1.95-36	4.91-36	1.46-35
30	1.54-31	-1.39-38	-2.20-37	-7.45-37	-1.89-36	-4.03-36	-7.46-36	-1.18-35	-1.55-35	-1.65-35	-1.38-35	-6.70-36	5.63-36	2.46-35
29	1.70-31	-1.57-38	-2.46-37	-8.35-37	-2.12-36	-4.55-36	-8.48-36	-1.35-35	-1.79-35	-1.94-35	-1.66-35	-8.75-36	5.30-36	2.75-35
28	1.90-31	-1.78-38	-2.76-37	-9.40-37	-2.40-36	-5.17-36	-9.70-36	-1.56-35	-2.08-35	-2.29-35	-2.02-35	-1.15-35	4.54-36	3.07-35
27	2.12-31	-2.02-38	-3.11-37	-1.06-36	-2.72-36	-5.91-36	-1.12-35	-1.81-35	-2.45-35	-2.75-35	-2.49-35	-1.54-35	3.07-36	3.42-35
26	2.38-31	-2.32-38	-3.52-37	-1.21-36	-3.11-36	-6.80-36	-1.30-35	-2.12-35	-2.92-35	-3.33-35	-3.12-35	-2.09-35	4.06-37	3.78-35
25	2.68-31	-2.67-38	-4.02-37	-1.38-36	-3.58-36	-7.89-36	-1.52-35	-2.52-35	-3.51-35	-4.09-35	-3.97-35	-2.88-35	-4.25-36	4.12-35
24	3.03-31	-3.10-38	-4.61-37	-1.59-36	-4.16-36	-9.23-36	-1.79-35	-3.02-35	-4.28-35	-5.12-35	-5.15-35	-4.04-35	-1.24-35	4.33-35
23	3.45-31	-3.62-38	-5.32-37	-1.85-36	-4.86-36	-1.09-35	-2.15-35	-3.66-35	-5.30-35	-6.52-35	-6.84-35	-5.82-35	-2.68-35	4.20-35
22	3.96-31	-4.26-38	-6.19-37	-2.17-36	-5.74-36	-1.30-35	-2.60-35	-4.52-35	-6.69-35	-8.49-35	-9.34-35	-8.64-35	-5.29-35	3.19-35
21	4.56-31	-5.06-38	-7.26-37	-2.56-36	-6.85-36	-1.57-35	-3.19-35	-5.66-35	-8.62-35	-1.13-34	-1.32-34	-1.33-34	-1.02-34	-5.23-37
20	5.30-31	-6.02-38	-8.58-37	-3.05-36	-8.27-36	-1.93-35	-3.99-35	-7.25-35	-1.14-34	-1.56-34	-1.92-34	-2.13-34	-1.99-34	-8.87-35
19	6.21-31	-7.24-38	-1.02-36	-3.68-36	-1.01-35	-2.40-35	-5.08-35	-9.50-35	-1.55-34	-2.24-34	-2.96-34	-3.65-34	-4.14-34	-3.59-34
18	7.34-31	-8.76-38	-1.23-36	-4.49-36	-1.25-35	-3.04-35	-6.61-35	-1.28-34	-2.19-34	-3.36-34	-4.84-34	-6.79-34	-9.49-34	-1.30-33
17	8.76-31	-1.06-37	-1.50-36	-5.55-36	-1.58-35	-3.94-35	-8.85-35	-1.79-34	-3.24-34	-5.37-34	-8.61-34	-1.42-33	-2.57-33	-5.79-33
16	1.06-30	-1.28-37	-1.85-36	-6.95-36	-2.03-35	-5.22-35	-1.22-34	-2.61-34	-5.07-34	-9.30-34	-1.72-33	-3.56-33	-9.60-33	-5.37-32
15	1.30-30	-1.54-37	-2.30-36	-8.83-36	-2.66-35	-7.10-35	-1.75-34	-4.02-34	-8.60-34	-1.81-33	-4.14-33	-1.24-32	-7.85-32	
14	1.61-30	-1.77-37	-2.87-36	-1.13-35	-3.54-35	-9.96-35	-2.63-34	-6.63-34	-1.62-33	-4.20-33	-1.38-32	-9.54-32		
13	2.04-30	-1.89-37	-3.57-36	-1.47-35	-4.81-35	-1.46-34	-4.19-34	-1.21-33	-3.63-33	-1.34-32	-1.01-31			
12	2.63-30	-1.62-37	-4.39-36	-1.90-35	-6.64-35	-2.18-34	-7.23-34	-2.56-33	-1.10-32	-9.31-32				
11	3.49-30	-3.78-38	-5.21-36	-2.43-35	-9.24-35	-3.46-34	-1.40-33	-7.12-33	-7.03-32					
10	4.77-30	2.85-37	-5.80-36	-3.02-35	-1.30-34	-5.92-34	-3.43-33	-4.01-32						
9	6.79-30	9.50-37	-5.99-36	-3.71-35	-1.93-34	-1.24-33	-1.63-32							
8	1.02-29	2.20-36	-5.87-36	-4.92-35	-3.58-34	-9.09-33								
7	1.64-29	4.72-36	-5.27-36	-8.20-35	-1.32-33									
6	2.95-29	1.10-35	-7.88-37	-2.33-34										
5	6.32-29	3.27-35	5.07-35											
4	1.89-28	1.75-34												
3	1.37-27													

	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.53-36	1.13-35	1.58-35	2.13-35	2.79-35	3.60-35	4.56-35	5.73-35	7.15-35	8.88-35	1.10-34	1.36-34	1.68-34	2.08-34
45	1.09-35	1.66-35	2.37-35	3.25-35	4.33-35	5.69-35	7.36-35	9.44-35	1.21-34	1.54-34	1.96-34	2.50-34	3.21-34	4.13-34
40	1.67-35	2.63-35	3.84-35	5.40-35	7.39-35	1.00-34	1.34-34	1.78-34	2.36-34	3.14-34	4.21-34	5.69-34	7.78-34	1.08-33
35	2.79-35	4.58-35	6.99-35	1.03-34	1.47-34	2.09-34	2.96-34	4.21-34	6.03-34	8.77-34	1.31-33	2.00-33	3.19-33	5.39-33
30	5.28-35	9.42-35	1.55-34	2.48-34	3.90-34	6.18-34	9.94-34	1.65-33	2.87-33	5.37-33	1.13-32	2.81-32	9.81-32	7.58-31
29	6.12-35	1.12-34	1.89-34	3.10-34	5.03-34	8.28-34	1.39-33	2.45-33	4.64-33	9.78-33	2.46-32	8.62-32	6.70-31	
28	7.16-35	1.35-34	2.35-34	3.97-34	6.70-34	1.16-33	2.07-33	3.95-33	8.41-33	2.13-32	7.53-32	5.86-31		
27	8.45-35	1.66-34	2.99-34	5.26-34	9.29-34	1.70-33	3.31-33	7.13-33	1.83-32	6.49-32	5.11-31			
26	1.01-34	2.07-34	3.90-34	7.22-34	1.36-33	2.71-33	5.93-33	1.54-32	5.51-32	4.36-31				
25	1.22-34	2.65-34	5.29-34	1.04-33	2.14-33	4.81-33	1.27-32	4.61-32	3.69-31					
24	1.49-34	3.49-34	7.50-34	1.62-33	3.75-33	1.02-32	3.77-32	3.06-31						
23	1.83-34	4.78-34	1.14-33	2.79-33	7.83-33	2.99-32	2.47-31							
22	2.27-34	6.89-34	1.89-33	5.68-33	2.25-32	1.92-31								
21	2.78-34	1.07-33	3.69-33	1.58-32	1.43-31									
20	3.23-34	1.88-33	9.72-33	9.62-32										
19	2.01-34	3.98-33	5.25-32											
18	-1.22-33	1.28-32												
17	-2.29-32													

HE + TE = 2.00+04 NE = 1.00+12 CASE B NC = 20

TOTAL RC = 1.339-12 4-3 RC = 1.854-13 4-3 EM = 7.856-25 2S RC = 3.381-13 2P RC = 1.001-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.63-03	1.11-03	4.79-04	2.48-04	1.45-04	9.16-05	6.17-05	4.35-05	3.18-05	2.39-05	1.85-05	1.45-05	1.17-05	9.49-06
45	4.99-03	1.53-03	6.58-04	3.41-04	1.99-04	1.26-04	8.48-05	5.98-05	4.37-05	3.29-05	2.54-05	2.00-05	1.60-05	1.30-05
40	7.14-03	2.19-03	9.41-04	4.87-04	2.84-04	1.80-04	1.21-04	8.54-05	6.24-05	4.70-05	3.62-05	2.85-05	2.29-05	1.86-05
35	1.07-02	3.29-03	1.41-03	7.32-04	4.27-04	2.70-04	1.82-04	1.28-04	9.36-05	7.04-05	5.43-05	4.28-05	3.43-05	2.79-05
30	1.72-02	5.27-03	2.26-03	1.17-03	6.83-04	4.32-04	2.91-04	2.05-04	1.50-04	1.13-04	8.68-05	6.83-05	5.47-05	4.44-05
29	1.91-02	5.84-03	2.51-03	1.30-03	7.58-04	4.80-04	3.23-04	2.27-04	1.66-04	1.25-04	9.62-05	7.57-05	6.06-05	4.92-05
28	2.12-02	6.51-03	2.80-03	1.45-03	8.44-04	5.34-04	3.59-04	2.53-04	1.85-04	1.39-04	1.07-04	8.42-05	6.74-05	5.48-05
27	2.37-02	7.28-03	3.13-03	1.62-03	9.44-04	5.97-04	4.01-04	2.83-04	2.06-04	1.55-04	1.20-04	9.41-05	7.53-05	6.12-05
26	2.67-02	8.18-03	3.51-03	1.82-03	1.06-03	6.71-04	4.51-04	3.17-04	2.32-04	1.74-04	1.34-04	1.06-04	8.44-05	6.86-05
25	3.01-02	9.23-03	3.96-03	2.05-03	1.20-03	7.57-04	5.09-04	3.58-04	2.61-04	1.96-04	1.51-04	1.19-04	9.51-05	7.72-05
24	3.42-02	1.05-02	4.50-03	2.33-03	1.36-03	8.58-04	5.77-04	4.06-04	2.96-04	2.23-04	1.71-04	1.35-04	1.08-04	8.73-05
23	3.90-02	1.20-02	5.13-03	2.66-03	1.55-03	9.79-04	6.58-04	4.63-04	3.38-04	2.54-04	1.95-04	1.53-04	1.23-04	9.93-05
22	4.48-02	1.37-02	5.89-03	3.05-03	1.78-03	1.12-03	7.55-04	5.31-04	3.87-04	2.91-04	2.24-04	1.76-04	1.40-04	1.13-04
21	5.18-02	1.59-02	6.81-03	3.52-03	2.05-03	1.30-03	8.72-04	6.13-04	4.47-04	3.36-04	2.58-04	2.02-04	1.61-04	1.30-04
20	6.03-02	1.85-02	7.93-03	4.10-03	2.39-03	1.51-03	1.01-03	7.13-04	5.20-04	3.90-04	3.00-04	2.35-04	1.87-04	1.51-04
19	7.09-02	2.17-02	9.32-03	4.82-03	2.80-03	1.77-03	1.19-03	8.36-04	6.09-04	4.56-04	3.50-04	2.74-04	2.18-04	1.75-04
18	8.40-02	2.57-02	1.10-02	5.71-03	3.32-03	2.10-03	1.41-03	9.89-04	7.20-04	5.39-04	4.13-04	3.22-04	2.55-04	2.03-04
17	1.01-01	3.08-02	1.32-02	6.83-03	3.98-03	2.51-03	1.68-03	1.18-03	8.58-04	6.42-04	4.91-04	3.81-04	2.99-04	2.34-04
16	1.22-01	3.74-02	1.60-02	8.27-03	4.81-03	3.04-03	2.03-03	1.43-03	1.03-03	7.72-04	5.87-04	4.53-04	3.50-04	2.58-04
15	1.50-01	4.58-02	1.96-02	1.01-02	5.89-03	3.72-03	2.49-03	1.74-03	1.26-03	9.36-04	7.07-04	5.36-04	3.89-04	
14	1.86-01	5.70-02	2.44-02	1.26-02	7.32-03	4.61-03	3.08-03	2.15-03	1.55-03	1.14-03	8.49-04	6.05-04		
13	2.35-01	7.20-02	3.08-02	1.59-02	9.22-03	5.80-03	3.86-03	2.69-03	1.92-03	1.39-03	9.73-04			
12	3.02-01	9.23-02	3.95-02	2.03-02	1.18-02	7.39-03	4.90-03	3.38-03	2.38-03	1.62-03				
11	3.93-01	1.20-01	5.12-02	2.63-02	1.52-02	9.50-03	6.26-03	4.25-03	2.81-03					
10	5.14-01	1.57-01	6.69-02	3.43-02	1.97-02	1.22-02	7.92-03	5.05-03						
9	6.67-01	2.03-01	8.64-02	4.42-02	2.52-02	1.54-02	9.37-03							
8	8.38-01	2.55-01	1.08-01	5.48-02	3.08-02	1.77-02								
7	1.02+00	3.10-01	1.30-01	6.50-02	3.44-02									
6	1.32+00	3.96-01	1.64-01	7.73-02										
5	1.97+00	5.83-01	2.28-01											
4	3.60+00	1.00+00												
3	9.17+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.82-06	6.53-06	5.50-06	4.68-06	4.01-06	3.47-06	3.02-06	2.64-06	2.32-06	2.06-06	1.83-06	1.63-06	1.46-06	1.31-06
45	1.08-05	8.97-06	7.56-06	6.43-06	5.51-06	4.76-06	4.14-06	3.62-06	3.19-06	2.82-06	2.50-06	2.23-06	2.00-06	1.80-06
40	1.53-05	1.28-05	1.08-05	9.16-06	7.86-06	6.78-06	5.90-06	5.16-06	4.53-06	4.01-06	3.56-06	3.17-06	2.84-06	2.55-06
35	2.30-05	1.91-05	1.61-05	1.37-05	1.17-05	1.01-05	8.79-06	7.68-06	6.75-06	5.95-06	5.28-06	4.69-06	4.19-06	3.74-06
30	3.66-05	3.05-05	2.56-05	2.18-05	1.86-05	1.60-05	1.39-05	1.21-05	1.06-05	9.27-06	8.14-06	7.12-06	6.14-06	5.01-06
29	4.05-05	3.38-05	2.84-05	2.41-05	2.06-05	1.77-05	1.53-05	1.33-05	1.16-05	1.02-05	8.84-06	7.60-06	6.18-06	
28	4.51-05	3.75-05	3.15-05	2.67-05	2.28-05	1.96-05	1.70-05	1.47-05	1.28-05	1.11-05	9.49-06	7.67-06		
27	5.03-05	4.19-05	3.52-05	2.98-05	2.54-05	2.18-05	1.88-05	1.62-05	1.40-05	1.19-05	9.61-06			
26	5.64-05	4.69-05	3.94-05	3.33-05	2.84-05	2.43-05	2.09-05	1.79-05	1.52-05	1.21-05				
25	6.35-05	5.27-05	4.42-05	3.73-05	3.17-05	2.71-05	2.31-05	1.94-05	1.55-05					
24	7.17-05	5.95-05	4.98-05	4.20-05	3.56-05	3.01-05	2.52-05	2.00-05						
23	8.15-05	6.75-05	5.64-05	4.73-05	3.98-05	3.31-05	2.61-05							
22	9.30-05	7.68-05	6.39-05	5.33-05	4.40-05	3.44-05								
21	1.07-04	8.77-05	7.24-05	5.93-05	4.61-05									
20	1.23-04	1.00-04	8.13-05	6.26-05										
19	1.41-04	1.13-04	8.65-05											
18	1.61-04	1.22-04												
17	1.75-04													

HE + TE = 2.00+04 NE = 1.00+12 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.39-32	-4.29-39	-3.80-38	-1.15-37	-2.39-37	-3.15-37	-1.17-37	4.71-37	1.40-36	2.63-36	4.15-36	6.00-36	8.24-36	1.09-35
45	3.28-32	-5.99-39	-5.28-38	-1.60-37	-3.35-37	-4.47-37	-1.76-37	6.44-37	1.96-36	3.71-36	5.91-36	8.63-36	1.20-35	1.60-35
40	4.68-32	-8.73-39	-7.65-38	-2.32-37	-4.91-37	-6.66-37	-2.86-37	9.09-37	2.85-36	5.49-36	8.88-36	1.31-35	1.85-35	2.52-35
35	7.00-32	-1.35-38	-1.17-37	-3.58-37	-7.67-37	-1.06-36	-5.07-37	1.33-36	4.42-36	8.71-36	1.44-35	2.17-35	3.12-35	4.35-35
30	1.12-31	-2.25-38	-1.93-37	-5.98-37	-1.30-36	-1.86-36	-1.03-36	2.04-36	7.40-36	1.52-35	2.59-35	4.05-35	6.04-35	8.79-35
29	1.24-31	-2.53-38	-2.16-37	-6.71-37	-1.47-36	-2.12-36	-1.21-36	2.23-36	8.31-36	1.72-35	2.97-35	4.68-35	7.07-35	1.04-34
28	1.38-31	-2.85-38	-2.43-37	-7.57-37	-1.66-36	-2.42-36	-1.43-36	2.44-36	9.37-36	1.97-35	3.43-35	5.47-35	8.36-35	1.25-34
27	1.54-31	-3.23-38	-2.74-37	-8.58-37	-1.90-36	-2.79-36	-1.72-36	2.66-36	1.06-35	2.27-35	3.99-35	6.46-35	1.00-34	1.52-34
26	1.73-31	-3.68-38	-3.11-37	-9.78-37	-2.18-36	-3.24-36	-2.08-36	2.90-36	1.21-35	2.63-35	4.70-35	7.71-35	1.22-34	1.88-34
25	1.95-31	-4.22-38	-3.56-37	-1.12-36	-2.52-36	-3.79-36	-2.54-36	3.16-36	1.39-35	3.08-35	5.60-35	9.34-35	1.50-34	2.38-34
24	2.20-31	-4.87-38	-4.09-37	-1.30-36	-2.94-36	-4.48-36	-3.15-36	3.41-36	1.61-35	3.64-35	6.75-35	1.15-34	1.89-34	3.09-34
23	2.51-31	-5.67-38	-4.74-37	-1.51-36	-3.46-36	-5.36-36	-3.96-36	3.64-36	1.88-35	4.36-35	8.28-35	1.45-34	2.45-34	4.14-34
22	2.87-31	-6.65-38	-5.54-37	-1.78-36	-4.11-36	-6.49-36	-5.06-36	3.81-36	2.21-35	5.30-35	1.03-34	1.86-34	3.27-34	5.79-34
21	3.32-31	-7.88-38	-6.53-37	-2.12-36	-4.95-36	-7.98-36	-6.58-36	3.83-36	2.62-35	6.55-35	1.32-34	2.47-34	4.55-34	8.54-34
20	3.85-31	-9.43-38	-7.78-37	-2.54-36	-6.03-36	-9.96-36	-8.73-36	3.58-36	3.14-35	8.25-35	1.74-34	3.41-34	6.67-34	1.36-33
19	4.51-31	-1.14-37	-9.37-37	-3.10-36	-7.48-36	-1.27-35	-1.19-35	2.72-36	3.80-35	1.06-34	2.37-34	4.95-34	1.05-33	2.41-33
18	5.33-31	-1.40-37	-1.15-36	-3.84-36	-9.44-36	-1.65-35	-1.67-35	6.99-37	4.63-35	1.41-34	3.38-34	7.72-34	1.85-33	5.11-33
17	6.37-31	-1.75-37	-1.42-36	-4.84-36	-1.22-35	-2.21-35	-2.42-35	-3.72-36	5.67-35	1.95-34	5.16-34	1.33-33	3.86-33	1.50-32
16	7.69-31	-2.21-37	-1.79-36	-6.22-36	-1.61-35	-3.06-35	-3.66-35	-1.33-35	6.88-35	2.84-34	8.64-34	2.72-33	1.11-32	9.60-32
15	9.41-31	-2.85-37	-2.31-36	-8.19-36	-2.20-35	-4.40-35	-5.82-35	-3.45-35	7.94-35	4.41-34	1.69-33	7.56-33	6.93-32	
14	1.17-30	-3.74-37	-3.04-36	-1.11-35	-3.11-35	-6.64-35	-9.88-35	-8.48-35	7.22-35	7.61-34	4.38-33	4.50-32		
13	1.48-30	-5.01-37	-4.11-36	-1.56-35	-4.61-35	-1.07-34	-1.83-34	-2.19-34	-3.77-35	1.55-33	2.32-32			
12	1.91-30	-6.84-37	-5.71-36	-2.28-35	-7.22-35	-1.87-34	-3.81-34	-6.49-34	-8.48-34	4.01-33				
11	2.53-30	-9.42-37	-8.18-36	-3.48-35	-1.22-34	-3.65-34	-9.51-34	-2.59-33	-1.17-32					
10	3.46-30	-1.28-36	-1.20-35	-5.58-35	-2.24-34	-8.41-34	-3.27-33	-2.21-32						
9	4.93-30	-1.84-36	-1.77-35	-9.41-35	-4.69-34	-2.57-33	-2.38-32							
8	7.40-30	-1.65-36	-2.51-35	-1.66-34	-1.20-33	-1.56-32								
7	1.19-29	-4.62-37	-3.31-35	-3.22-34	-5.44-33									
6	2.15-29	3.46-36	-4.48-35	-1.07-33										
5	4.59-29	1.74-35	-8.59-35											
4	1.37-28	1.25-34												
3	9.96-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.42-35	1.81-35	2.28-35	2.85-35	3.54-35	4.37-35	5.36-35	6.57-35	8.04-35	9.83-35	1.20-34	1.47-34	1.80-34	2.22-34
45	2.11-35	2.72-35	3.48-35	4.40-35	5.55-35	6.97-35	8.73-35	1.09-34	1.37-34	1.72-34	2.16-34	2.72-34	3.46-34	4.42-34
40	3.36-35	4.42-35	5.76-35	7.46-35	9.64-35	1.24-34	1.61-34	2.08-34	2.71-34	3.55-34	4.69-34	6.26-34	8.48-34	1.17-33
35	5.96-35	8.08-35	1.09-34	1.46-34	1.97-34	2.67-34	3.65-34	5.04-34	7.06-34	1.01-33	1.48-33	2.24-33	3.53-33	5.91-33
30	1.26-34	1.81-34	2.59-34	3.75-34	5.50-34	8.26-34	1.28-33	2.05-33	3.48-33	6.39-33	1.32-32	3.25-32	1.12-31	8.56-31
29	1.52-34	2.20-34	3.22-34	4.77-34	7.21-34	1.12-33	1.81-33	3.09-33	5.70-33	1.18-32	2.91-32	1.00-31	7.70-31	
28	1.85-34	2.74-34	4.10-34	6.25-34	9.78-34	1.59-33	2.73-33	5.05-33	1.05-32	2.60-32	9.00-32	6.91-31		
27	2.29-34	3.48-34	5.36-34	8.46-34	1.38-33	2.39-33	4.44-33	9.25-33	2.31-32	8.01-32	6.18-31			
26	2.91-34	4.54-34	7.24-34	1.20-33	2.08-33	3.89-33	8.12-33	2.03-32	7.08-32	5.48-31				
25	3.78-34	6.12-34	1.02-33	1.79-33	3.37-33	7.09-33	1.78-32	6.24-32	4.84-31					
24	5.09-34	8.61-34	1.52-33	2.89-33	6.12-33	1.55-32	5.45-32	4.25-31						
23	7.14-34	1.28-33	2.46-33	5.25-33	1.34-32	4.73-32	3.70-31							
22	1.06-33	2.06-33	4.44-33	1.14-32	4.06-32	3.20-31								
21	1.69-33	3.70-33	9.61-33	3.45-32	2.74-31									
20	3.03-33	7.98-33	2.90-32	2.32-31										
19	6.48-33	2.39-32	1.93-31											
18	1.92-32	1.58-31												
17	1.25-31													

HE + TE = 2.00+04 NE = 1.00+13 CASE B NC = 20

TOTAL RC = 1.803-12 4-3 RC = 2.689-13 4-3 EM = 1.140-24 2S RC = 3.961-13 2P RC = 1.407-12

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.50-03	7.68-04	3.30-04	1.71-04	9.97-05	6.32-05	4.25-05	3.00-05	2.19-05	1.65-05	1.27-05	1.00-05	8.04-06	6.54-06
45	3.44-03	1.06-03	4.54-04	2.35-04	1.37-04	8.69-05	5.84-05	4.12-05	3.01-05	2.27-05	1.75-05	1.38-05	1.10-05	8.99-06
40	4.92-03	1.51-03	6.49-04	3.36-04	1.96-04	1.24-04	8.35-05	5.88-05	4.30-05	3.24-05	2.50-05	1.97-05	1.58-05	1.28-05
35	7.39-03	2.27-03	9.74-04	5.04-04	2.94-04	1.86-04	1.25-04	8.83-05	6.45-05	4.85-05	3.74-05	2.95-05	2.36-05	1.92-05
30	1.18-02	3.63-03	1.56-03	8.08-04	4.71-04	2.98-04	2.00-04	1.41-04	1.03-04	7.76-05	5.98-05	4.71-05	3.77-05	3.06-05
29	1.31-02	4.03-03	1.73-03	8.96-04	5.22-04	3.31-04	2.22-04	1.57-04	1.14-04	8.61-05	6.63-05	5.22-05	4.18-05	3.40-05
28	1.46-02	4.49-03	1.93-03	9.98-04	5.82-04	3.68-04	2.48-04	1.74-04	1.27-04	9.58-05	7.38-05	5.81-05	4.65-05	3.78-05
27	1.64-02	5.02-03	2.16-03	1.12-03	6.51-04	4.12-04	2.77-04	1.95-04	1.42-04	1.07-04	8.25-05	6.49-05	5.19-05	4.22-05
26	1.84-02	5.64-03	2.42-03	1.25-03	7.31-04	4.63-04	3.11-04	2.19-04	1.60-04	1.20-04	9.26-05	7.28-05	5.82-05	4.73-05
25	2.08-02	6.37-03	2.73-03	1.42-03	8.25-04	5.22-04	3.51-04	2.47-04	1.80-04	1.36-04	1.04-04	8.21-05	6.56-05	5.33-05
24	2.36-02	7.23-03	3.10-03	1.61-03	9.36-04	5.92-04	3.98-04	2.80-04	2.04-04	1.54-04	1.18-04	9.29-05	7.43-05	6.03-05
23	2.69-02	8.25-03	3.54-03	1.83-03	1.07-03	6.76-04	4.54-04	3.19-04	2.33-04	1.75-04	1.35-04	1.06-04	8.46-05	6.85-05
22	3.09-02	9.48-03	4.07-03	2.10-03	1.23-03	7.75-04	5.21-04	3.66-04	2.67-04	2.01-04	1.54-04	1.21-04	9.68-05	7.83-05
21	3.58-02	1.10-02	4.70-03	2.43-03	1.42-03	8.96-04	6.02-04	4.23-04	3.09-04	2.32-04	1.78-04	1.40-04	1.11-04	9.01-05
20	4.17-02	1.28-02	5.48-03	2.84-03	1.65-03	1.04-03	7.01-04	4.93-04	3.59-04	2.69-04	2.07-04	1.62-04	1.29-04	1.04-04
19	4.90-02	1.50-02	6.44-03	3.33-03	1.94-03	1.23-03	8.23-04	5.78-04	4.21-04	3.16-04	2.42-04	1.89-04	1.50-04	1.21-04
18	5.82-02	1.78-02	7.65-03	3.95-03	2.30-03	1.45-03	9.75-04	6.85-04	4.98-04	3.73-04	2.86-04	2.23-04	1.76-04	1.41-04
17	6.98-02	2.14-02	9.17-03	4.74-03	2.76-03	1.74-03	1.17-03	8.19-04	5.96-04	4.45-04	3.40-04	2.65-04	2.08-04	1.63-04
16	8.49-02	2.60-02	1.11-02	5.76-03	3.35-03	2.11-03	1.41-03	9.91-04	7.20-04	5.37-04	4.09-04	3.15-04	2.43-04	1.79-04
15	1.05-01	3.20-02	1.37-02	7.09-03	4.12-03	2.60-03	1.76-03	1.22-03	8.80-04	6.54-04	4.96-04	3.74-04	2.72-04	
14	1.31-01	4.01-02	1.72-02	8.87-03	5.15-03	3.24-03	2.17-03	1.51-03	1.09-03	8.04-04	5.97-04	4.26-04		
13	1.67-01	5.12-02	2.19-02	1.13-02	6.55-03	4.12-03	2.75-03	1.91-03	1.37-03	9.90-04	6.91-04			
12	2.19-01	6.68-02	2.86-02	1.47-02	8.52-03	5.34-03	3.55-03	2.45-03	1.72-03	1.17-03				
11	2.93-01	8.95-02	3.82-02	1.97-02	1.14-02	7.09-03	4.67-03	3.17-03	2.09-03					
10	4.05-01	1.23-01	5.26-02	2.70-02	1.55-02	9.63-03	6.23-03	3.97-03						
9	5.77-01	1.76-01	7.48-02	3.82-02	2.18-02	1.33-02	8.08-03							
8	8.47-01	2.57-01	1.09-01	5.52-02	3.10-02	1.78-02								
7	1.25+00	3.78-01	1.59-01	7.90-02	4.17-02									
6	1.74+00	5.21-01	2.15-01	1.01-01										
5	2.28+00	6.71-01	2.61-01											
4	3.60+00	1.00+00												
3	8.67+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.39-06	4.50-06	3.79-06	3.23-06	2.77-06	2.39-06	2.08-06	1.82-06	1.60-06	1.42-06	1.26-06	1.12-06	1.01-06	9.06-07
45	7.41-06	6.18-06	5.21-06	4.43-06	3.80-06	3.28-06	2.85-06	2.50-06	2.20-06	1.94-06	1.73-06	1.54-06	1.38-06	1.24-06
40	1.06-05	8.82-06	7.43-06	6.32-06	5.42-06	4.68-06	4.06-06	3.55-06	3.13-06	2.76-06	2.45-06	2.19-06	1.96-06	1.76-06
35	1.58-05	1.32-05	1.11-05	9.44-06	8.09-06	6.98-06	6.06-06	5.30-06	4.65-06	4.10-06	3.64-06	3.23-06	2.89-06	2.58-06
30	2.52-05	2.10-05	1.77-05	1.50-05	1.28-05	1.11-05	9.58-06	8.34-06	7.29-06	6.39-06	5.61-06	4.91-06	4.24-06	3.45-06
29	2.80-05	2.33-05	1.96-05	1.66-05	1.42-05	1.22-05	1.06-05	9.19-06	8.02-06	7.00-06	6.10-06	5.24-06	4.26-06	
28	3.11-05	2.59-05	2.17-05	1.84-05	1.57-05	1.35-05	1.17-05	1.01-05	8.82-06	7.64-06	6.54-06	5.29-06		
27	3.47-05	2.89-05	2.43-05	2.05-05	1.75-05	1.50-05	1.30-05	1.12-05	9.66-06	8.23-06	6.63-06			
26	3.89-05	3.23-05	2.71-05	2.30-05	1.96-05	1.68-05	1.44-05	1.23-05	1.05-05	8.38-06				
25	4.38-05	3.64-05	3.05-05	2.58-05	2.19-05	1.87-05	1.59-05	1.34-05	1.07-05					
24	4.95-05	4.11-05	3.44-05	2.90-05	2.45-05	2.08-05	1.74-05	1.38-05						
23	5.62-05	4.66-05	3.89-05	3.27-05	2.74-05	2.28-05	1.80-05							
22	6.42-05	5.30-05	4.41-05	3.68-05	3.04-05	2.38-05								
21	7.36-05	6.06-05	5.00-05	4.10-05	3.18-05									
20	8.47-05	6.92-05	5.62-05	4.33-05										
19	9.76-05	7.84-05	5.99-05											
18	1.12-04	8.44-05												
17	1.21-04													

HE + TE = 2.00+04 NE = 1.00+13 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.56-33	-1.92-39	-1.79-38	-1.44-38	1.56-37	5.91-37	1.22-36	2.01-36	2.99-36	4.19-36	5.66-36	7.46-36	9.66-36	1.23-35
45	9.01-33	-2.73-39	-2.50-38	-2.10-38	2.14-37	8.20-37	1.70-36	2.82-36	4.22-36	5.95-36	8.11-36	1.08-35	1.41-35	1.81-35
40	1.29-32	-4.06-39	-3.66-38	-3.24-38	3.05-37	1.19-36	2.48-36	4.15-36	6.26-36	8.92-36	1.23-35	1.65-35	2.18-35	2.86-35
35	1.92-32	-6.45-39	-5.68-38	-5.42-38	4.55-37	1.81-36	3.83-36	6.49-36	9.92-36	1.43-35	2.01-35	2.75-35	3.71-35	4.97-35
30	3.07-32	-1.12-38	-9.58-38	-1.01-37	7.22-37	2.97-36	6.43-36	1.11-35	1.73-35	2.57-35	3.69-35	5.21-35	7.29-35	1.02-34
29	3.40-32	-1.27-38	-1.08-37	-1.16-37	7.99-37	3.32-36	7.22-36	1.25-35	1.97-35	2.93-35	4.25-35	6.05-35	8.55-35	1.21-34
28	3.79-32	-1.45-38	-1.22-37	-1.35-37	8.87-37	3.73-36	8.16-36	1.42-35	2.25-35	3.38-35	4.94-35	7.10-35	1.02-34	1.45-34
27	4.23-32	-1.66-38	-1.38-37	-1.58-37	9.88-37	4.20-36	9.26-36	1.63-35	2.59-35	3.93-35	5.79-35	8.43-35	1.22-34	1.77-34
26	4.74-32	-1.92-38	-1.58-37	-1.86-37	1.10-36	4.77-36	1.06-35	1.88-35	3.01-35	4.60-35	6.87-35	1.01-34	1.49-34	2.21-34
25	5.35-32	-2.23-38	-1.82-37	-2.21-37	1.24-36	5.46-36	1.22-35	2.18-35	3.53-35	5.46-35	8.25-35	1.24-34	1.85-34	2.81-34
24	6.05-32	-2.62-38	-2.12-37	-2.66-37	1.40-36	6.24-36	1.41-35	2.55-35	4.18-35	6.56-35	1.01-34	1.54-34	2.36-34	3.67-34
23	6.90-32	-3.10-38	-2.48-37	-3.22-37	1.58-36	7.22-36	1.65-35	3.02-35	5.02-35	7.99-35	1.25-34	1.95-34	3.07-34	4.95-34
22	7.90-32	-3.70-38	-2.92-37	-3.96-37	1.80-36	8.43-36	1.96-35	3.62-35	6.11-35	9.91-35	1.58-34	2.54-34	4.15-34	6.98-34
21	9.11-32	-4.47-38	-3.49-37	-4.94-37	2.05-36	9.92-36	2.34-35	4.40-35	7.57-35	1.25-34	2.06-34	3.42-34	5.83-34	1.04-33
20	1.06-31	-5.47-38	-4.22-37	-6.24-37	2.35-36	1.18-35	2.84-35	5.45-35	9.57-35	1.63-34	2.77-34	4.81-34	8.69-34	1.68-33
19	1.24-31	-6.79-38	-5.16-37	-8.03-37	2.71-36	1.42-35	3.50-35	6.87-35	1.24-34	2.19-34	3.88-34	7.14-34	1.40-33	3.03-33
18	1.47-31	-8.56-38	-6.42-37	-1.05-36	3.12-36	1.73-35	4.39-35	8.87-35	1.66-34	3.05-34	5.75-34	1.14-33	2.51-33	6.56-33
17	1.75-31	-1.10-37	-8.14-37	-1.42-36	3.59-36	2.15-35	5.64-35	1.18-34	2.31-34	4.50-34	9.17-34	2.05-33	5.41-33	1.97-32
16	2.11-31	-1.44-37	-1.05-36	-1.95-36	4.10-36	2.72-35	7.44-35	1.63-34	3.39-34	7.15-34	1.64-33	4.39-33	1.62-32	1.31-31
15	2.59-31	-1.93-37	-1.40-36	-2.78-36	4.61-36	3.52-35	1.02-34	2.38-34	5.34-34	1.27-33	3.48-33	1.30-32	1.07-31	
14	3.21-31	-2.66-37	-1.91-36	-4.11-36	4.94-36	4.67-35	1.46-34	3.71-34	9.38-34	2.67-33	1.03-32	8.55-32		
13	4.06-31	-3.79-37	-2.71-36	-6.35-36	4.63-36	6.42-35	2.21-34	6.42-34	1.95-33	7.79-33	4.96-32			
12	5.25-31	-5.60-37	-4.01-36	-1.04-35	2.41-36	9.18-35	3.74-34	1.31-33	5.58-33	3.45-32				
11	6.96-31	-8.63-37	-6.25-36	-1.82-35	-5.63-36	1.38-34	7.24-34	3.61-33	2.11-32					
10	9.52-31	-1.40-36	-1.04-35	-3.48-35	-3.30-35	2.16-34	1.83-33	9.04-33						
9	1.36-30	-2.38-36	-1.89-35	-7.54-35	-1.37-34	3.13-34								
8	2.03-30	-4.25-36	-3.77-35	-1.94-34	-6.65-34	-9.41-34								
7	3.28-30	-7.98-36	-8.35-35	-6.55-34	-6.25-33									
6	5.90-30	-1.12-35	-2.02-34	-3.97-33										
5	1.26-29	-5.79-36	-6.43-34											
4	3.77-29	8.05-35												
3	2.74-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.56-33	1.95-33	2.42-33	2.99-33	3.68-33	4.51-33	5.52-33	6.73-33	8.21-33	1.00-32	1.22-32	1.49-32	1.82-32	2.24-32
45	2.32-33	2.93-33	3.69-33	4.63-33	5.78-33	7.22-33	8.99-33	1.12-32	1.40-32	1.75-32	2.19-32	2.77-32	3.51-32	4.47-32
40	3.71-33	4.78-33	6.14-33	7.86-33	1.01-32	1.29-32	1.66-32	2.14-32	2.77-32	3.62-32	4.77-32	6.36-32	8.61-32	1.18-31
35	6.62-33	8.78-33	1.17-32	1.55-32	2.07-32	2.78-32	3.78-32	5.19-32	7.25-32	1.03-31	1.51-31	2.28-31	3.60-31	6.00-31
30	1.42-32	1.98-32	2.80-32	4.00-32	5.81-32	8.66-32	1.33-31	2.13-31	3.60-31	6.59-31	1.35-30	3.33-30	1.14-29	8.74-29
29	1.70-32	2.42-32	3.49-32	5.10-32	7.63-32	1.18-31	1.89-31	3.21-31	5.90-31	1.21-30	3.00-30	1.03-29	7.90-29	
28	2.08-32	3.02-32	4.45-32	6.69-32	1.04-31	1.67-31	2.85-31	5.25-31	1.08-30	2.68-30	9.26-30	7.10-29		
27	2.59-32	3.85-32	5.83-32	9.08-32	1.47-31	2.52-31	4.66-31	9.64-31	2.39-30	8.29-30	6.38-29			
26	3.30-32	5.04-32	7.90-32	1.29-31	2.21-31	4.11-31	8.54-31	2.13-30	7.38-30	5.69-29				
25	4.32-32	6.82-32	1.12-31	1.93-31	3.60-31	7.52-31	1.88-30	6.54-30	5.06-29					
24	5.84-32	9.65-32	1.68-31	3.14-31	6.58-31	1.69-30	5.77-30	4.47-29						
23	8.25-32	1.44-31	2.72-31	5.73-31	1.44-30	5.07-30	3.94-29							
22	1.23-31	2.34-31	4.95-31	1.25-30	4.41-30	3.45-29								
21	1.99-31	4.24-31	1.08-30	3.82-30	3.00-29									
20	3.61-31	9.25-31	3.29-30	2.59-29										
19	7.83-31	2.80-30	2.22-29											
18	2.36-30	1.88-29												
17	1.58-29													

HE + TE = 3.00+04 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 6.538-13 4-3 RC = 1.096-13 4-3 EM = 4.644-25 2S RC = 2.036-13 2P RC = 4.502-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.19-03	4.20-04	2.09-04	1.22-04	7.77-05	5.27-05	3.75-05	2.76-05	2.09-05	1.62-05	1.29-05	1.03-05	8.44-06	6.98-06
45	1.61-03	5.72-04	2.86-04	1.67-04	1.07-04	7.24-05	5.15-05	3.80-05	2.88-05	2.23-05	1.77-05	1.42-05	1.16-05	9.61-06
40	2.27-03	8.10-04	4.06-04	2.37-04	1.52-04	1.03-04	7.34-05	5.41-05	4.11-05	3.19-05	2.52-05	2.03-05	1.66-05	1.37-05
35	3.37-03	1.20-03	6.04-04	3.53-04	2.26-04	1.54-04	1.10-04	8.09-05	6.14-05	4.77-05	3.78-05	3.04-05	2.48-05	2.05-05
30	5.33-03	1.91-03	9.57-04	5.60-04	3.59-04	2.45-04	1.74-04	1.29-04	9.78-05	7.60-05	6.02-05	4.84-05	3.96-05	3.27-05
29	5.90-03	2.11-03	1.06-03	6.20-04	3.97-04	2.71-04	1.93-04	1.43-04	1.08-04	8.42-05	6.67-05	5.37-05	4.38-05	3.62-05
28	6.55-03	2.34-03	1.18-03	6.89-04	4.42-04	3.01-04	2.15-04	1.59-04	1.20-04	9.36-05	7.41-05	5.97-05	4.87-05	4.03-05
27	7.30-03	2.61-03	1.31-03	7.68-04	4.93-04	3.36-04	2.40-04	1.77-04	1.34-04	1.04-04	8.28-05	6.66-05	5.44-05	4.49-05
26	8.17-03	2.92-03	1.47-03	8.60-04	5.52-04	3.76-04	2.68-04	1.98-04	1.51-04	1.17-04	9.28-05	7.47-05	6.10-05	5.04-05
25	9.18-03	3.28-03	1.65-03	9.67-04	6.21-04	4.24-04	3.02-04	2.23-04	1.70-04	1.32-04	1.05-04	8.41-05	6.87-05	5.67-05
24	1.04-02	3.70-03	1.86-03	1.09-03	7.02-04	4.79-04	3.42-04	2.53-04	1.92-04	1.49-04	1.18-04	9.52-05	7.77-05	6.41-05
23	1.18-02	4.20-03	2.12-03	1.24-03	7.98-04	5.45-04	3.89-04	2.88-04	2.19-04	1.70-04	1.35-04	1.08-04	8.83-05	7.29-05
22	1.34-02	4.80-03	2.42-03	1.42-03	9.12-04	6.23-04	4.45-04	3.29-04	2.50-04	1.94-04	1.54-04	1.24-04	1.01-04	8.32-05
21	1.54-02	5.52-03	2.78-03	1.63-03	1.05-03	7.17-04	5.12-04	3.79-04	2.88-04	2.24-04	1.77-04	1.43-04	1.16-04	9.56-05
20	1.78-02	6.38-03	3.22-03	1.89-03	1.22-03	8.31-04	5.94-04	4.40-04	3.34-04	2.60-04	2.06-04	1.65-04	1.35-04	1.10-04
19	2.08-02	7.44-03	3.75-03	2.21-03	1.42-03	9.72-04	6.95-04	5.14-04	3.91-04	3.04-04	2.41-04	1.93-04	1.57-04	1.28-04
18	2.44-02	8.74-03	4.41-03	2.60-03	1.67-03	1.15-03	8.19-04	6.07-04	4.61-04	3.59-04	2.84-04	2.27-04	1.83-04	1.48-04
17	2.90-02	1.04-02	5.24-03	3.09-03	1.99-03	1.36-03	9.76-04	7.23-04	5.50-04	4.27-04	3.37-04	2.69-04	2.15-04	1.70-04
16	3.47-02	1.24-02	6.29-03	3.71-03	2.39-03	1.64-03	1.18-03	8.71-04	6.62-04	5.13-04	4.04-04	3.19-04	2.50-04	1.81-04
15	4.21-02	1.51-02	7.64-03	4.51-03	2.92-03	2.00-03	1.43-03	1.06-03	8.07-04	6.24-04	4.87-04	3.77-04	2.71-04	
14	5.17-02	1.86-02	9.42-03	5.57-03	3.60-03	2.47-03	1.77-03	1.31-03	9.96-04	7.65-04	5.85-04	4.18-04		
13	6.46-02	2.32-02	1.18-02	6.99-03	4.53-03	3.11-03	2.23-03	1.65-03	1.24-03	9.38-04	6.63-04			
12	8.21-02	2.95-02	1.50-02	8.94-03	5.80-03	3.99-03	2.86-03	2.11-03	1.56-03	1.09-03				
11	1.07-01	3.84-02	1.96-02	1.17-02	7.61-03	5.24-03	3.75-03	2.72-03	1.88-03					
10	1.42-01	5.14-02	2.63-02	1.58-02	1.03-02	7.07-03	5.00-03	3.39-03						
9	1.96-01	7.10-02	3.66-02	2.20-02	1.43-02	9.80-03	6.52-03							
8	2.82-01	1.02-01	5.30-02	3.20-02	2.08-02	1.35-02								
7	4.27-01	1.56-01	8.14-02	4.93-02	3.07-02									
6	6.95-01	2.55-01	1.35-01	7.94-02										
5	1.26+00	4.67-01	2.45-01											
4	2.72+00	1.00+00												
3	7.97+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.83-06	4.92-06	4.19-06	3.59-06	3.11-06	2.70-06	2.36-06	2.08-06	1.83-06	1.63-06	1.45-06	1.30-06	1.16-06	1.05-06
45	8.03-06	6.77-06	5.77-06	4.95-06	4.27-06	3.72-06	3.25-06	2.85-06	2.52-06	2.24-06	1.99-06	1.78-06	1.59-06	1.43-06
40	1.15-05	9.67-06	8.23-06	7.06-06	6.10-06	5.30-06	4.63-06	4.06-06	3.59-06	3.18-06	2.82-06	2.52-06	2.25-06	2.02-06
35	1.71-05	1.45-05	1.23-05	1.05-05	9.10-06	7.90-06	6.89-06	6.04-06	5.32-06	4.70-06	4.16-06	3.69-06	3.28-06	2.92-06
30	2.73-05	2.30-05	1.96-05	1.67-05	1.44-05	1.25-05	1.08-05	9.45-06	8.25-06	7.20-06	6.27-06	5.42-06	4.58-06	3.60-06
29	3.02-05	2.55-05	2.16-05	1.85-05	1.59-05	1.38-05	1.19-05	1.04-05	9.03-06	7.83-06	6.74-06	5.68-06	4.44-06	
28	3.36-05	2.83-05	2.40-05	2.05-05	1.77-05	1.52-05	1.32-05	1.14-05	9.86-06	8.45-06	7.09-06	5.53-06		
27	3.75-05	3.16-05	2.68-05	2.29-05	1.96-05	1.69-05	1.45-05	1.25-05	1.07-05	8.93-06	6.93-06			
26	4.20-05	3.54-05	3.00-05	2.55-05	2.18-05	1.87-05	1.60-05	1.36-05	1.13-05	8.76-06				
25	4.73-05	3.97-05	3.36-05	2.86-05	2.44-05	2.08-05	1.76-05	1.46-05	1.12-05					
24	5.34-05	4.48-05	3.79-05	3.21-05	2.72-05	2.29-05	1.89-05	1.44-05						
23	6.06-05	5.08-05	4.27-05	3.60-05	3.01-05	2.47-05	1.88-05							
22	6.91-05	5.77-05	4.83-05	4.02-05	3.28-05	2.48-05								
21	7.91-05	6.57-05	5.44-05	4.41-05	3.32-05									
20	9.09-05	7.46-05	6.02-05	4.50-05										
19	1.04-04	8.35-05	6.20-05											
18	1.18-04	8.69-05												
17	1.24-04													

HE + TE = 3.00+04 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	6.55-39	8.52-39	1.38-38	2.27-38	3.61-38	5.47-38	7.95-38	1.11-37	1.51-37	1.98-37	2.54-37	3.17-37	3.87-37
45	0.00+00	8.97-39	1.17-38	1.91-38	3.17-38	5.04-38	7.63-38	1.10-37	1.53-37	2.05-37	2.64-37	3.30-37	3.99-37	4.63-37
40	0.00+00	1.28-38	1.68-38	2.76-38	4.62-38	7.40-38	1.13-37	1.64-37	2.27-37	3.04-37	3.90-37	4.82-37	5.69-37	6.36-37
35	0.00+00	1.92-38	2.53-38	4.22-38	7.14-38	1.16-37	1.79-37	2.63-37	3.69-37	4.97-37	6.43-37	7.95-37	9.30-37	1.01-36
30	0.00+00	3.07-38	4.10-38	6.95-38	1.20-37	1.98-37	3.12-37	4.67-37	6.70-37	9.21-37	1.21-36	1.51-36	1.76-36	1.81-36
29	0.00+00	3.41-38	4.57-38	7.77-38	1.34-37	2.23-37	3.53-37	5.[illegible]-37	7.68-37	1.06-36	1.40-36	1.76-36	2.04-36	2.06-36
28	0.00+00	3.80-38	5.10-38	8.72-38	1.52-37	2.53-37	4.03-37	6.1[illegible]-37	8.87-37	1.23-36	1.64-36	2.05-36	2.37-36	2.33-36
27	0.00+00	4.25-38	5.73-38	9.83-38	1.72-37	2.89-37	4.63-37	7.07-37	1.03-36	1.44-36	1.93-36	2.43-36	2.78-36	2.63-36
26	0.00+00	4.77-38	6.46-38	1.11-37	1.96-37	3.32-37	5.35-37	8.24-37	1.21-36	1.71-36	2.30-36	2.89-36	3.28-36	2.91-36
25	0.00+00	5.39-38	7.32-38	1.27-37	2.25-37	3.84-37	6.24-37	9.68-37	1.44-36	2.04-36	2.76-36	3.48-36	3.88-36	3.11-36
24	0.00+00	6.11-38	8.35-38	1.46-37	2.60-37	4.48-37	7.34-37	1.15-36	1.72-36	2.47-36	3.36-36	4.24-36	4.59-36	3.01-36
23	0.00+00	6.98-38	9.58-38	1.69-37	3.03-37	5.26-37	8.72-37	1.38-36	2.09-36	3.03-36	4.15-36	5.21-36	5.37-36	2.13-36
22	0.00+00	8.02-38	1.11-37	1.96-37	3.56-37	6.25-37	1.05-36	1.68-36	2.58-36	3.77-36	5.21-36	6.46-36	6.05-36	-8.40-37
21	0.00+00	9.28-38	1.29-37	2.31-37	4.23-37	7.51-37	1.27-36	2.07-36	3.22-36	4.79-36	6.65-36	8.05-36	6.11-36	-9.58-36
20	0.00+00	1.08-37	1.51-37	2.73-37	5.08-37	9.15-37	1.58-36	2.60-36	4.12-36	6.20-36	8.63-36	9.92-36	3.76-36	-3.58-35
19	0.00+00	1.27-37	1.79-37	3.28-37	6.18-37	1.13-36	1.98-36	3.34-36	5.39-36	8.24-36	1.14-35	1.15-35	-7.33-36	-1.24-34
18	0.00+00	1.51-37	2.15-37	3.98-37	7.63-37	1.42-36	2.55-36	4.39-36	7.25-36	1.13-35	1.52-35	1.03-35	-5.30-35	-4.96-34
17	0.00+00	1.81-37	2.61-37	4.91-37	9.60-37	1.83-36	3.36-36	5.95-36	1.01-35	1.59-35	1.97-35	-6.63-36	-2.70-34	-2.87-33
16	0.00+00	2.20-37	3.21-37	6.16-37	1.23-36	2.41-36	4.57-36	8.38-36	1.47-35	2.31-35	2.05-35	-1.15-34	-1.77-33	-4.21-32
15	0.00+00	2.71-37	4.02-37	7.89-37	1.62-36	3.29-36	6.48-36	1.24-35	2.25-35	3.35-35	-1.68-35	-9.86-34	-2.86-32	
14	0.00+00	3.40-37	5.13-37	1.04-36	2.21-36	4.67-36	9.67-36	1.96-35	3.67-35	3.80-35	-4.51-34	-1.81-32		
13	0.00+00	4.35-37	6.71-37	1.40-36	3.13-36	7.00-36	1.55-35	3.37-35	6.18-35	-1.18-34	-1.09-32			
12	0.00+00	5.69-37	9.05-37	1.98-36	4.69-36	1.13-35	2.75-35	6.53-35	6.42-35	-5.28-33				
11	0.00+00	7.67-37	1.27-36	2.95-36	7.56-36	2.03-35	5.69-35	1.40-34	-2.01-33					
10	0.00+00	1.07-36	1.87-36	4.71-36	1.36-35	4.33-35	1.50-34	-2.32-34						
9	0.00+00	1.57-36	2.94-36	8.39-36	2.93-35	1.25-34	5.36-34							
8	0.00+00	2.47-36	5.13-36	1.78-35	8.68-35	6.94-34								
7	0.00+00	4.25-36	1.05-35	5.22-35	5.56-34									
6	0.00+00	8.53-36	2.92-35	3.40-34										
5	0.00+00	2.25-35	1.73-34											
4	0.00+00	1.16-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.60-37	5.32-37	5.96-37	6.41-37	6.51-37	6.03-37	4.63-37	1.85-37	-2.98-37	-1.08-36	-2.29-36	-4.12-36	-6.84-36	-1.08-35
45	5.13-37	5.32-37	4.97-37	3.71-37	1.01-37	-3.91-37	-1.22-36	-2.55-36	-4.62-36	-7.80-36	-1.26-35	-1.98-35	-3.06-35	-4.68-35
40	6.55-37	5.84-37	3.55-37	-1.37-37	-1.05-36	-2.65-36	-5.32-36	-9.67-36	-1.67-35	-2.79-35	-4.59-35	-7.49-35	-1.22-34	-1.99-34
35	9.52-37	6.37-37	-1.54-37	-1.79-36	-4.90-36	-1.06-35	-2.07-35	-3.86-35	-7.06-35	-1.28-34	-2.34-34	-4.36-34	-8.38-34	-1.69-33
30	1.39-36	-3.72-38	-3.56-36	-1.13-35	-2.77-35	-6.18-35	-1.34-34	-2.92-34	-6.58-34	-1.58-33	-4.19-33	-1.33-32	-5.87-32	-5.82-31
29	1.43-36	-6.25-37	-5.74-36	-1.73-35	-4.26-35	-9.80-35	-2.23-34	-5.19-34	-1.28-33	-3.49-33	-1.13-32	-5.14-32	-5.22-31	
28	1.38-36	-1.67-36	-9.37-36	-2.74-35	-6.87-35	-1.65-34	-4.00-34	-1.02-33	-2.86-33	-9.56-33	-4.45-32	-4.66-31		
27	1.13-36	-3.56-36	-1.57-35	-4.54-35	-1.18-34	-3.00-34	-7.94-34	-2.31-33	-7.95-33	-3.82-32	-4.13-31			
26	4.89-37	-7.08-36	-2.73-35	-7.97-35	-2.17-34	-6.05-34	-1.83-33	-6.52-33	-3.24-32	-3.63-31				
25	-9.96-37	-1.39-35	-5.02-35	-1.51-34	-4.47-34	-1.41-33	-5.25-33	-2.71-32	-3.16-31					
24	-4.31-36	-2.79-35	-9.90-35	-3.18-34	-1.07-33	-4.15-33	-2.23-32	-2.72-31						
23	-1.19-35	-5.92-35	-2.16-34	-7.80-34	-3.20-33	-1.81-32	-2.32-31							
22	-3.00-35	-1.37-34	-5.48-34	-2.41-33	-1.44-32	-1.94-31								
21	-7.81-35	-3.65-34	-1.75-33	-1.11-32	-1.60-31									
20	-2.26-34	-1.22-33	-8.41-33	-1.30-31										
19	-8.08-34	-6.15-33	-1.03-31											
18	-4.31-33	-7.92-32												
17	-5.89-32													

HE + TE = 3.00+04 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 6.541-13 4-3 RC = 1.095-13 4-3 EM = 4.640-25 2S RC = 2.037-13 2P RC = 4.503-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.34-03	4.56-04	2.19-04	1.25-04	7.81-05	5.24-05	3.70-05	2.71-05	2.04-05	1.58-05	1.25-05	1.00-05	8.18-06	6.76-06
45	1.73-03	5.99-04	2.93-04	1.68-04	1.07-04	7.20-05	5.10-05	3.75-05	2.84-05	2.20-05	1.74-05	1.40-05	1.14-05	9.41-06
40	2.37-03	8.29-04	4.10-04	2.38-04	1.52-04	1.03-04	7.30-05	5.37-05	4.07-05	3.16-05	2.50-05	2.01-05	1.64-05	1.36-05
35	3.44-03	1.22-03	6.07-04	3.54-04	2.26-04	1.54-04	1.09-04	8.06-05	6.11-05	4.75-05	3.76-05	3.02-05	2.47-05	2.04-05
30	5.38-03	1.91-03	9.59-04	5.61-04	3.59-04	2.44-04	1.74-04	1.29-04	9.75-05	7.57-05	6.00-05	4.83-05	3.94-05	3.25-05
29	5.94-03	2.12-03	1.06-03	6.21-04	3.98-04	2.71-04	1.[illegible]-04	1.42-04	1.08-04	8.39-05	6.65-05	5.35-05	4.36-05	3.61-05
28	6.58-03	2.35-03	1.18-03	6.90-04	4.42-04	3.01-04	2.14-04	1.58-04	1.20-04	9.33-05	7.39-05	5.95-05	4.85-05	4.01-05
27	7.33-03	2.62-03	1.31-03	7.69-04	4.93-04	3.36-04	2.39-04	1.77-04	1.34-04	1.04-04	8.25-05	6.64-05	5.42-05	4.47-05
26	8.20-03	2.93-03	1.47-03	8.61-04	5.52-04	3.76-04	2.68-04	1.98-04	1.50-04	1.17-04	9.25-05	7.45-05	6.07-05	5.01-05
25	9.21-03	3.29-03	1.65-03	9.68-04	6.21-04	4.23-04	3.02-04	2.23-04	1.69-04	1.32-04	1.04-04	8.39-05	6.84-05	5.64-05
24	1.04-02	3.71-03	1.87-03	1.09-03	7.02-04	4.79-04	3.42-04	2.52-04	1.92-04	1.49-04	1.18-04	9.49-05	7.74-05	6.38-05
23	1.18-02	4.21-03	2.12-03	1.24-03	7.98-04	5.45-04	3.89-04	2.87-04	2.18-04	1.70-04	1.34-04	1.08-04	8.80-05	7.25-05
22	1.35-02	4.81-03	2.42-03	1.42-03	9.13-04	6.23-04	4.45-04	3.29-04	2.50-04	1.94-04	1.54-04	1.24-04	1.01-04	8.29-05
21	1.55-02	5.52-03	2.78-03	1.63-03	1.05-03	7.17-04	5.12-04	3.79-04	2.88-04	2.24-04	1.77-04	1.42-04	1.16-04	9.52-05
20	1.79-02	6.39-03	3.22-03	1.89-03	1.22-03	8.31-04	5.94-04	4.39-04	3.34-04	2.59-04	2.05-04	1.65-04	1.34-04	1.10-04
19	2.08-02	7.45-03	3.76-03	2.21-03	1.42-03	9.71-04	6.94-04	5.14-04	3.90-04	3.03-04	2.40-04	1.92-04	1.56-04	1.27-04
18	2.45-02	8.75-03	4.42-03	2.60-03	1.67-03	1.15-03	8.19-04	6.06-04	4.61-04	3.58-04	2.83-04	2.26-04	1.83-04	1.48-04
17	2.90-02	1.04-02	5.25-03	3.09-03	1.99-03	1.36-03	9.75-04	7.22-04	5.49-04	4.26-04	3.36-04	2.68-04	2.14-04	1.70-04
16	3.47-02	1.24-02	6.30-03	3.71-03	2.39-03	1.64-03	1.17-03	8.69-04	6.61-04	5.12-04	4.02-04	3.18-04	2.49-04	1.84-04
15	4.21-02	1.51-02	7.65-03	4.52-03	2.92-03	2.00-03	1.43-03	1.06-03	8.05-04	6.22-04	4.85-04	3.76-04	2.74-04	
14	5.18-02	1.86-02	9.42-03	5.57-03	3.60-03	2.47-03	1.77-03	1.31-03	9.93-04	7.62-04	5.83-04	4.21-04		
13	6.47-02	2.32-02	1.18-02	6.99-03	4.53-03	3.11-03	2.23-03	1.65-03	1.24-03	9.35-04	6.67-04			
12	8.22-02	2.96-02	1.51-02	8.94-03	5.80-03	3.99-03	2.86-03	2.10-03	1.56-03	1.10-03				
11	1.07-01	3.85-02	1.97-02	1.17-02	7.61-03	5.24-03	3.74-03	2.71-03	1.88-03					
10	1.43-01	5.14-02	2.64-02	1.58-02	1.03-02	7.06-03	4.99-03	3.39-03						
9	1.96-01	7.10-02	3.66-02	2.20-02	1.43-02	9.78-03	6.51-03							
8	2.82-01	1.02-01	5.31-02	3.20-02	2.08-02	1.35-02								
7	4.27-01	1.56-01	8.14-02	4.92-02	3.07-02									
6	6.96-01	2.56-01	1.35-01	7.94-02										
5	1.26+00	4.67-01	2.45-01											
4	2.72+00	1.00+00												
3	7.98+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.64-06	4.76-06	4.05-06	3.48-06	3.00-06	2.61-06	2.29-06	2.01-06	1.78-06	1.58-06	1.41-06	1.26-06	1.13-06	1.02-06
45	7.87-06	6.64-06	5.65-06	4.85-06	4.19-06	3.64-06	3.18-06	2.80-06	2.47-06	2.20-06	1.96-06	1.75-06	1.57-06	1.41-06
40	1.13-05	9.56-06	8.13-06	6.97-06	6.02-06	5.23-06	4.57-06	4.02-06	3.55-06	3.14-06	2.80-06	2.50-06	2.24-06	2.01-06
35	1.70-05	1.44-05	1.22-05	1.05-05	9.03-06	7.84-06	6.84-06	6.00-06	5.29-06	4.67-06	4.14-06	3.69-06	3.28-06	2.93-06
30	2.72-05	2.29-05	1.94-05	1.66-05	1.43-05	1.24-05	1.08-05	9.41-06	8.24-06	7.21-06	6.31-06	5.49-06	4.69-06	3.76-06
29	3.01-05	2.54-05	2.15-05	1.84-05	1.58-05	1.37-05	1.19-05	1.04-05	9.03-06	7.87-06	6.81-06	5.80-06	4.63-06	
28	3.35-05	2.82-05	2.39-05	2.04-05	1.76-05	1.52-05	1.31-05	1.14-05	9.85-06	8.53-06	7.23-06	5.75-06		
27	3.73-05	3.14-05	2.67-05	2.28-05	1.95-05	1.68-05	1.45-05	1.25-05	1.08-05	9.09-06	7.20-06			
26	4.18-05	3.52-05	2.98-05	2.54-05	2.18-05	1.87-05	1.60-05	1.37-05	1.19-05	9.08-06				
25	4.70-05	3.95-05	3.35-05	2.85-05	2.43-05	2.08-05	1.76-05	1.48-05	1.16-05					
24	5.32-05	4.46-05	3.77-05	3.20-05	2.71-05	2.29-05	1.91-05	1.49-05						
23	6.03-05	5.06-05	4.26-05	3.59-05	3.02-05	2.50-05	1.94-05							
22	6.88-05	5.75-05	4.81-05	4.02-05	3.31-05	2.55-05								
21	7.88-05	6.55-05	5.43-05	4.44-05	3.40-05									
20	9.05-05	7.45-05	6.05-05	4.60-05										
19	1.04-04	8.37-05	6.32-05											
18	1.18-04	8.84-05												
17	1.26-04													

HE + TE = 3.00+04 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	6.66-39	8.18-39	1.24-38	2.01-38	3.32-38	5.53-38	9.13-38	1.48-37	2.35-37	3.65-37	5.54-37	8.22-37	1.20-36
45	0.00+00	9.17-39	1.17-38	1.87-38	3.09-38	5.06-38	8.09-38	1.26-37	1.93-37	2.89-37	4.23-37	6.09-37	8.63-37	1.21-36
40	0.00+00	1.30-38	1.70-38	2.78-38	4.65-38	7.56-38	1.18-37	1.79-37	2.62-37	3.73-37	5.20-37	7.09-37	9.51-37	1.26-36
35	0.00+00	1.94-38	2.56-38	4.25-38	7.19-38	1.17-37	1.83-37	2.73-37	3.91-37	5.44-37	7.32-37	9.57-37	1.22-36	1.50-36
30	0.00+00	3.08-38	4.12-38	6.96-38	1.20-37	1.98-37	3.12-37	4.69-37	6.77-37	9.40-37	1.26-36	1.61-36	1.96-36	2.23-36
29	0.00+00	3.42-38	4.58-38	7.77-38	1.34-37	2.23-37	3.53-37	5.33-37	7.72-37	1.07-36	1.44-36	1.84-36	2.23-36	2.49-36
28	0.00+00	3.81-38	5.11-38	8.71-38	1.51-37	2.52-37	4.02-37	6.10-37	8.87-37	1.24-36	1.66-36	2.13-36	2.56-36	2.79-36
27	0.00+00	4.26-38	5.74-38	9.82-38	1.71-37	2.88-37	4.60-37	7.03-37	1.03-36	1.44-36	1.94-36	2.49-36	2.98-36	3.15-36
26	0.00+00	4.78-38	6.47-38	1.11-37	1.95-37	3.30-37	5.31-37	8.17-37	1.20-36	1.70-36	2.30-36	2.95-36	3.50-36	3.55-36
25	0.00+00	5.40-38	7.33-38	1.27-37	2.26-37	3.81-37	6.19-37	9.59-37	1.42-36	2.03-36	2.76-36	3.54-36	4.14-36	3.97-36
24	0.00+00	6.12-38	8.35-38	1.45-37	2.59-37	4.44-37	7.27-37	1.14-36	1.70-36	2.45-36	3.35-36	4.31-36	4.95-36	4.29-36
23	0.00+00	6.99-38	9.58-38	1.68-37	3.02-37	5.22-37	8.63-37	1.36-36	2.06-36	3.00-36	4.14-36	5.31-36	5.93-36	4.23-36
22	0.00+00	8.03-38	1.11-37	1.96-37	3.54-37	6.20-37	1.04-36	1.66-36	2.54-36	3.73-36	5.19-36	6.64-36	7.03-36	3.00-36
21	0.00+00	9.28-38	1.29-37	2.30-37	4.21-37	7.45-37	1.26-36	2.04-36	3.18-36	4.73-36	6.65-36	8.41-36	8.00-36	-1.70-36
20	0.00+00	1.08-37	1.51-37	2.73-37	5.05-37	9.07-37	1.56-36	2.57-36	4.06-36	6.14-36	8.69-36	1.07-35	7.85-36	-1.73-35
19	0.00+00	1.27-37	1.79-37	3.27-37	6.15-37	1.12-36	1.96-36	3.29-36	5.32-36	8.18-36	1.16-35	1.34-35	2.77-36	-7.19-35
18	0.00+00	1.51-37	2.15-37	3.97-37	7.59-37	1.41-36	2.52-36	4.33-36	7.16-36	1.12-35	1.59-35	1.53-35	-2.33-35	-3.02-34
17	0.00+00	1.81-37	2.60-37	4.90-37	9.54-37	1.81-36	3.32-36	5.88-36	1.00-35	1.60-35	2.18-35	9.03-36	-1.55-34	-1.73-33
16	0.00+00	2.20-37	3.21-37	6.14-37	1.22-36	2.39-36	4.52-36	8.29-36	1.46-35	2.38-35	2.80-35	-5.15-35	-1.07-33	-2.39-32
15	0.00+00	2.71-37	4.01-37	7.87-37	1.61-36	3.26-36	6.41-36	1.23-35	2.26-35	3.65-35	1.53-35	-5.79-34	-1.66-32	
14	0.00+00	3.40-37	5.13-37	1.03-36	2.20-36	4.63-36	9.58-36	1.95-35	3.76-35	5.25-35	-2.33-34	-1.08-32		
13	0.00+00	4.35-37	6.71-37	1.40-36	3.11-36	6.94-36	1.54-35	3.38-35	6.73-35	-1.23-35	-6.33-33			
12	0.00+00	5.69-37	9.14-37	1.97-36	4.66-36	1.12-35	2.74-35	6.68-35	1.09-34	-3.12-33				
11	0.00+00	7.67-37	1.27-36	2.93-36	7.52-36	2.02-35	5.69-35	1.56-34	-1.03-33					
10	0.00+00	1.07-36	1.86-36	4.69-36	1.35-35	4.31-35	1.54-34	1.52-34						
9	0.00+00	1.58-36	2.94-36	8.36-36	2.91-35	1.29-34	6.55-34							
8	0.00+00	2.47-36	5.12-36	1.77-35	8.63-35	7.18-34								
7	0.00+00	4.26-36	1.05-35	5.20-35	5.57-34									
6	0.00+00	8.53-36	2.92-35	3.39-34										
5	0.00+00	2.25-35	1.73-34											
4	0.00+00	1.16-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.71-36	2.81-36	3.34-36	4.58-36	6.21-36	8.35-36	1.11-35	1.48-35	1.95-35	2.56-35	3.35-35	4.37-35	5.69-35	7.42-35
45	1.66-36	2.27-36	3.07-36	4.11-36	5.47-36	7.24-36	9.53-36	1.25-35	1.64-35	2.14-35	2.79-35	3.64-35	4.76-35	6.24-35
40	1.64-36	2.10-36	2.67-36	3.36-36	4.16-36	5.10-36	6.15-36	7.29-36	8.44-36	9.42-36	9.92-36	9.34-36	6.52-36	-7.04-37
35	1.77-36	2.00-36	2.09-36	1.89-36	1.14-36	-6.38-37	-4.24-36	-1.11-35	-2.39-35	-4.76-35	-9.17-35	-1.76-34	-3.44-34	-6.97-34
30	2.24-36	1.65-36	-1.99-37	-4.59-36	-1.41-35	-3.39-35	-7.53-35	-1.64-34	-3.63-34	-8.45-34	-2.17-33	-6.59-33	-2.79-32	-2.65-31
29	2.35-36	1.33-36	-1.61-36	-8.54-36	-2.38-35	-5.69-35	-1.30-34	-2.97-34	-7.10-34	-1.86-33	-5.79-33	-2.49-32	-2.42-31	
28	2.44-36	7.33-37	-3.97-36	-1.52-35	-4.07-35	-9.88-35	-2.36-34	-5.84-34	-1.57-33	-5.00-33	-2.21-32	-2.19-31		
27	2.44-36	-3.94-37	-8.10-36	-2.69-35	-7.19-35	-1.82-34	-4.69-34	-1.30-33	-4.27-33	-1.93-32	-1.97-31			
26	2.22-36	-2.56-36	-1.57-35	-4.92-35	-1.35-34	-3.66-34	-1.06-33	-3.58-33	-1.67-32	-1.75-31				
25	1.52-36	-6.86-36	-3.05-35	-9.89-35	-2.76-34	-8.40-34	-2.95-33	-1.42-32	-1.54-31					
24	-3.06-37	-1.58-35	-6.20-35	-2.00-34	-6.47-34	-2.38-33	-1.19-32	-1.34-31						
23	-4.79-36	-3.59-35	-1.37-34	-4.82-34	-1.88-33	-9.33-33	-1.15-31							
22	-1.60-35	-8.58-35	-3.43-34	-1.44-33	-7.96-33	-9.78-32								
21	-4.64-35	-2.29-34	-1.06-33	-6.30-33	-8.19-32									
20	-1.40-34	-7.52-34	-4.85-33	-6.74-32										
19	-4.99-34	-3.61-33	-5.43-32											
18	-2.57-33	-4.27-32												
17	-3.26-32													

HE + TE = 3.00+04 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 6.545-13 4-3 RC = 1.090-13 4-3 EM = 4.621-25 2S RC = 2.041-13 2P RC = 4.504-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.79-03	5.72-04	2.56-04	1.37-04	8.27-05	5.37-05	3.70-05	2.66-05	1.97-05	1.51-05	1.18-05	9.38-06	7.59-06	6.24-06
45	2.21-03	7.22-04	3.31-04	1.81-04	1.10-04	7.25-05	5.03-05	3.64-05	2.72-05	2.09-05	1.64-05	1.31-05	1.06-05	8.75-06
40	2.82-03	9.44-04	4.44-04	2.48-04	1.54-04	1.02-04	7.17-05	5.22-05	3.93-05	3.03-05	2.39-05	1.91-05	1.56-05	1.28-05
35	3.83-03	1.31-03	6.33-04	3.61-04	2.27-04	1.53-04	1.08-04	7.90-05	5.97-05	4.62-05	3.64-05	2.93-05	2.38-05	1.97-05
30	5.68-03	1.98-03	9.77-04	5.66-04	3.60-04	2.44-04	1.73-04	1.27-04	9.63-05	7.46-05	5.90-05	4.78-05	3.86-05	3.19-05
29	6.22-03	2.18-03	1.08-03	6.25-04	3.98-04	2.70-04	1.92-04	1.41-04	1.07-04	8.29-05	6.55-05	5.26-05	4.29-05	3.54-05
28	6.85-03	2.40-03	1.19-03	6.94-04	4.42-04	3.00-04	2.13-04	1.57-04	1.19-04	9.23-05	7.29-05	5.86-05	4.77-05	3.94-05
27	7.57-03	2.67-03	1.33-03	7.73-04	4.94-04	3.35-04	2.38-04	1.76-04	1.33-04	1.03-04	8.16-05	6.55-05	5.34-05	4.40-05
26	8.42-03	2.97-03	1.48-03	8.65-04	5.53-04	3.76-04	2.67-04	1.97-04	1.49-04	1.16-04	9.15-05	7.35-05	5.99-05	4.94-05
25	9.42-03	3.33-03	1.67-03	9.73-04	6.22-04	4.23-04	3.01-04	2.22-04	1.68-04	1.31-04	1.03-04	8.29-05	6.75-05	5.56-05
24	1.06-02	3.76-03	1.88-03	1.10-03	7.04-04	4.79-04	3.41-04	2.51-04	1.91-04	1.48-04	1.17-04	9.38-05	7.64-05	6.29-05
23	1.20-02	4.26-03	2.14-03	1.25-03	8.00-04	5.45-04	3.88-04	2.86-04	2.17-04	1.68-04	1.33-04	1.07-04	8.69-05	7.15-05
22	1.36-02	4.85-03	2.44-03	1.43-03	9.15-04	6.23-04	4.44-04	3.28-04	2.49-04	1.93-04	1.52-04	1.22-04	9.93-05	8.16-05
21	1.56-02	5.57-03	2.80-03	1.64-03	1.05-03	7.18-04	5.12-04	3.78-04	2.86-04	2.22-04	1.75-04	1.41-04	1.14-04	9.37-05
20	1.80-02	6.44-03	3.24-03	1.90-03	1.22-03	8.32-04	5.93-04	4.38-04	3.32-04	2.58-04	2.03-04	1.63-04	1.32-04	1.08-04
19	2.10-02	7.50-03	3.78-03	2.22-03	1.42-03	9.72-04	6.94-04	5.12-04	3.88-04	3.01-04	2.38-04	1.90-04	1.54-04	1.25-04
18	2.46-02	8.81-03	4.44-03	2.61-03	1.68-03	1.15-03	8.18-04	6.04-04	4.58-04	3.55-04	2.80-04	2.23-04	1.80-04	1.45-04
17	2.92-02	1.04-02	5.27-03	3.10-03	2.00-03	1.36-03	9.74-04	7.19-04	5.45-04	4.22-04	3.32-04	2.64-04	2.11-04	1.67-04
16	3.50-02	1.25-02	6.33-03	3.73-03	2.40-03	1.64-03	1.17-03	8.66-04	6.56-04	5.07-04	3.97-04	3.13-04	2.45-04	1.81-04
15	4.24-02	1.52-02	7.69-03	4.53-03	2.92-03	2.00-03	1.43-03	1.06-03	7.99-04	6.15-04	4.78-04	3.69-04	2.70-04	
14	5.21-02	1.87-02	9.47-03	5.59-03	3.61-03	2.47-03	1.77-03	1.30-03	9.85-04	7.53-04	5.74-04	4.14-04		
13	6.51-02	2.33-02	1.19-02	7.01-03	4.53-03	3.11-03	2.22-03	1.64-03	1.23-03	9.21-04	6.56-04			
12	8.27-02	2.97-02	1.51-02	8.97-03	5.81-03	3.99-03	2.85-03	2.09-03	1.54-03	1.08-03				
11	1.08-01	3.87-02	1.97-02	1.17-02	7.61-03	5.23-03	3.72-03	2.68-03	1.85-03					
10	1.43-01	5.17-02	2.65-02	1.58-02	1.03-02	7.03-03	4.94-03	3.35-03						
9	1.98-01	7.14-02	3.67-02	2.20-02	1.43-02	9.72-03	6.43-03							
8	2.84-01	1.03-01	5.32-02	3.20-02	2.07-02	1.33-02								
7	4.30-01	1.57-01	8.17-02	4.92-02	3.04-02									
6	7.00-01	2.57-01	1.35-01	7.89-02										
5	1.27+00	4.69-01	2.44-01											
4	2.73+00	1.00+00												
3	8.01+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.18-06	4.35-06	3.69-06	3.16-06	2.73-06	2.37-06	2.07-06	1.82-06	1.61-06	1.42-06	1.27-06	1.14-06	1.02-06	9.22-07
45	7.29-06	6.14-06	5.21-06	4.47-06	3.86-06	3.35-06	2.93-06	2.58-06	2.28-06	2.02-06	1.80-06	1.61-06	1.45-06	1.31-06
40	1.07-05	9.02-06	7.67-06	6.57-06	5.67-06	4.93-06	4.31-06	3.79-06	3.34-06	2.97-06	2.64-06	2.36-06	2.12-06	1.91-06
35	1.64-05	1.38-05	1.18-05	1.01-05	8.69-06	7.54-06	6.58-06	5.78-06	5.09-06	4.50-06	4.00-06	3.56-06	3.18-06	2.84-06
30	2.66-05	2.24-05	1.90-05	1.62-05	1.40-05	1.21-05	1.05-05	9.17-06	8.02-06	7.04-06	6.16-06	5.38-06	4.62-06	3.73-06
29	2.95-05	2.48-05	2.10-05	1.80-05	1.55-05	1.34-05	1.16-05	1.01-05	8.81-06	7.69-06	6.68-06	5.71-06	4.60-06	
28	3.28-05	2.76-05	2.34-05	2.00-05	1.72-05	1.48-05	1.28-05	1.11-05	9.67-06	8.36-06	7.12-06	5.71-06		
27	3.67-05	3.08-05	2.61-05	2.23-05	1.91-05	1.64-05	1.42-05	1.23-05	1.06-05	8.95-06	7.14-06			
26	4.11-05	3.45-05	2.92-05	2.49-05	2.13-05	1.83-05	1.57-05	1.34-05	1.13-05	9.01-06				
25	4.63-05	3.88-05	3.28-05	2.79-05	2.38-05	2.03-05	1.73-05	1.45-05	1.15-05					
24	5.23-05	4.38-05	3.69-05	3.13-05	2.66-05	2.25-05	1.88-05	1.48-05						
23	5.93-05	4.96-05	4.17-05	3.52-05	2.96-05	2.45-05	1.92-05							
22	6.76-05	5.64-05	4.72-05	3.94-05	3.25-05	2.52-05								
21	7.74-05	6.42-05	5.33-05	4.36-05	3.36-05									
20	8.89-05	7.31-05	5.94-05	4.54-05										
19	1.02-04	8.22-05	6.24-05											
18	1.16-04	8.72-05												
17	1.24-04													

HE + TE = 3.00+04 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	5.85-39	4.44-39	2.24-39	-5.71-40	-6.61-40	9.35-39	4.22-38	1.18-37	2.65-37	5.25-37	9.52-37	1.62-36	2.63-36
45	0.00+00	8.60-39	8.40-39	9.23-39	1.20-38	2.14-38	4.67-38	1.03-37	2.15-37	4.16-37	7.55-37	1.30-36	2.13-36	3.39-36
40	0.00+00	1.29-38	1.49-38	2.09-38	3.30-38	5.69-38	1.03-37	1.90-37	3.42-37	5.96-37	1.01-36	1.64-36	2.61-36	4.05-36
35	0.00+00	1.97-38	2.50-38	3.93-38	6.53-38	1.10-37	1.85-37	3.07-37	5.02-37	8.04-37	1.26-36	1.95-36	2.97-36	4.47-36
30	0.00+00	3.14-38	4.16-38	6.89-38	1.17-37	1.96-37	3.16-37	4.96-37	7.56-37	1.13-36	1.65-36	2.37-36	3.37-36	4.75-36
29	0.00+00	3.48-38	4.63-38	7.72-38	1.32-37	2.20-37	3.55-37	5.52-37	8.34-37	1.23-36	1.77-36	2.51-36	3.51-36	4.83-36
28	0.00+00	3.87-38	5.16-38	8.67-38	1.49-37	2.49-37	4.00-37	6.20-37	9.30-37	1.36-36	1.93-36	2.69-36	3.68-36	4.92-36
27	0.00+00	4.31-38	5.78-38	9.77-38	1.69-37	2.83-37	4.54-37	7.02-37	1.05-36	1.52-36	2.13-36	2.92-36	3.89-36	5.02-36
26	0.00+00	4.83-38	6.51-38	1.11-37	1.92-37	3.23-37	5.20-37	8.03-37	1.19-36	1.72-36	2.39-36	3.22-36	4.17-36	5.10-36
25	0.00+00	5.45-38	7.36-38	1.26-37	2.20-37	3.72-37	6.00-37	9.28-37	1.38-36	1.98-36	2.73-36	3.61-36	4.51-36	5.12-36
24	0.00+00	6.17-38	8.38-38	1.44-37	2.54-37	4.31-37	7.00-37	1.09-36	1.62-36	2.31-36	3.17-36	4.12-36	4.93-36	4.95-36
23	0.00+00	7.03-38	9.59-38	1.66-37	2.95-37	5.05-37	8.25-37	1.29-36	1.93-36	2.76-36	3.76-36	4.79-36	5.39-36	4.28-36
22	0.00+00	8.06-38	1.11-37	1.93-37	3.46-37	5.98-37	9.85-37	1.55-36	2.33-36	3.36-36	4.56-36	5.66-36	5.78-36	2.32-36
21	0.00+00	9.31-38	1.29-37	2.27-37	4.10-37	7.16-37	1.19-36	1.90-36	2.89-36	4.17-36	5.65-36	6.78-36	5.77-36	-3.01-36
20	0.00+00	1.08-37	1.51-37	2.69-37	4.92-37	8.69-37	1.47-36	2.37-36	3.64-36	5.32-36	7.16-36	8.10-36	4.28-36	-1.81-35
19	0.00+00	1.27-37	1.79-37	3.22-37	5.97-37	1.07-36	1.84-36	3.02-36	4.72-36	6.96-36	9.27-36	9.33-36	-2.29-36	-6.53-35
18	0.00+00	1.51-37	2.14-37	3.91-37	7.37-37	1.35-36	2.36-36	3.95-36	6.30-36	9.40-36	1.22-35	8.92-36	-2.78-35	-2.46-34
17	0.00+00	1.81-37	2.59-37	4.82-37	9.26-37	1.73-36	3.10-36	5.32-36	8.71-36	1.31-35	1.58-35	-2.54-37	-1.39-34	-1.26-33
16	0.00+00	2.20-37	3.19-37	6.04-37	1.19-36	2.28-36	4.21-36	7.46-36	1.26-35	1.90-35	1.79-35	-5.75-35	-8.26-34	-1.49-32
15	0.00+00	2.72-37	3.99-37	7.74-37	1.56-36	3.10-36	5.94-36	1.10-35	1.91-35	2.78-35	-4.93-38	-4.79-34	-1.09-32	
14	0.00+00	3.40-37	5.10-37	1.02-36	2.13-36	4.39-36	8.84-36	1.72-35	3.11-35	3.57-35	-2.18-34	-7.52-33		
13	0.00+00	4.35-37	6.67-37	1.38-36	3.01-36	6.56-36	1.41-35	2.95-35	5.32-35	-3.64-35	-4.71-33			
12	0.00+00	5.69-37	8.99-37	1.94-36	4.50-36	1.06-35	2.48-35	5.68-35	7.39-35	-2.52-33				
11	0.00+00	7.68-37	1.26-36	2.88-36	7.24-36	1.89-35	5.09-35	1.25-34	-9.50-34					
10	0.00+00	1.07-36	1.85-36	4.60-36	1.30-35	3.99-35	1.33-34	3.11-35						
9	0.00+00	1.58-36	2.92-36	8.18-36	2.77-35	1.13-34	5.13-34							
8	0.00+00	2.47-36	5.08-36	1.73-35	8.14-35	6.23-34								
7	0.00+00	4.26-36	1.04-35	5.04-35	5.12-34									
6	0.00+00	8.53-36	2.88-35	3.24-34										
5	0.00+00	2.25-35	1.70-34											
4	0.00+00	1.16-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.12-36	6.25-36	9.24-36	1.34-35	1.91-35	2.68-35	3.73-35	5.13-35	7.00-35	9.49-35	1.28-34	1.72-34	2.31-34	3.09-34
45	5.22-36	7.85-36	1.16-35	1.68-35	2.40-35	3.40-35	4.77-35	6.65-35	9.22-35	1.27-34	1.75-34	2.42-34	3.34-34	4.62-34
40	6.14-36	9.17-36	1.35-35	1.96-35	2.83-35	4.05-35	5.77-35	8.21-35	1.17-34	1.66-34	2.37-34	3.41-34	4.96-34	7.30-34
35	6.64-36	9.78-36	1.43-35	2.09-35	3.04-35	4.42-35	6.46-35	9.50-35	1.41-34	2.12-34	3.24-34	5.09-34	8.29-34	1.42-33
30	6.65-36	9.25-36	1.28-35	1.77-35	2.45-35	3.37-35	4.59-35	6.14-35	7.82-35	8.55-35	3.68-35	-2.85-34	-2.19-33	-2.06-32
29	6.57-36	8.84-36	1.17-35	1.53-35	1.93-35	2.28-35	2.31-35	1.13-35	-3.99-35	-2.26-34	-9.47-34	-4.98-33	-4.13-32	
28	6.44-36	8.18-36	9.91-36	1.10-35	9.65-36	1.38-36	-2.62-35	-1.10-34	-3.71-34	-1.31-33	-5.91-33	-5.34-32		
27	6.18-36	7.03-36	6.72-36	3.16-36	-8.93-36	-4.35-35	-1.41-34	-4.34-34	-1.47-33	-6.50-33	-5.93-32			
26	5.67-36	4.99-36	9.22-37	-1.18-35	-4.72-35	-1.46-34	-4.40-34	-1.48-33	-6.57-33	-6.10-32				
25	4.65-36	1.15-36	-1.03-35	-4.27-35	-1.34-34	-4.11-34	-1.40-33	-6.29-33	-5.97-32					
24	2.55-36	-6.50-36	-3.37-35	-1.13-34	-3.59-34	-1.26-33	-5.79-33	-5.64-32						
23	-1.96-36	-2.29-35	-8.77-35	-2.97-34	-1.08-33	-5.15-33	-5.18-32							
22	-1.23-35	-6.20-35	-2.31-34	-8.94-34	-4.44-33	-4.65-32								
21	-3.82-35	-1.69-34	-7.08-34	-3.72-33	-4.09-32									
20	-1.13-34	-5.34-34	-3.02-33	-3.52-32										
19	-3.78-34	-2.36-33	-2.96-32											
18	-1.77-33	-2.43-32												
17	-1.94-32													

HE + TE = 3.00+04 NE = 1.00+05 CASE B NC = 70

TOTAL RC = 6.554-13 4-3 RC = 1.082-13 4-3 EM = 4.586-25 2S RC = 2.047-13 2P RC = 4.507-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.23-03	6.90-04	2.99-04	1.56-04	9.14-05	5.82-05	3.93-05	2.78-05	2.04-05	1.54-05	1.19-05	9.42-06	7.57-06	6.18-06
45	2.88-03	8.95-04	3.90-04	2.04-04	1.20-04	7.70-05	5.22-05	3.70-05	2.72-05	2.06-05	1.60-05	1.27-05	1.02-05	8.32-06
40	3.78-03	1.19-03	5.24-04	2.77-04	1.65-04	1.06-04	7.25-05	5.17-05	3.82-05	2.90-05	2.26-05	1.79-05	1.45-05	1.18-05
35	5.02-03	1.61-03	7.27-04	3.92-04	2.37-04	1.54-04	1.06-04	7.66-05	5.70-05	4.35-05	3.41-05	2.71-05	2.20-05	1.80-05
30	6.90-03	2.29-03	1.07-03	5.92-04	3.65-04	2.42-04	1.69-04	1.23-04	9.19-05	7.07-05	5.56-05	4.45-05	3.61-05	2.97-05
29	7.42-03	2.48-03	1.17-03	6.50-04	4.02-04	2.67-04	1.87-04	1.36-04	1.02-04	7.88-05	6.20-05	4.96-05	4.03-05	3.32-05
28	8.02-03	2.70-03	1.28-03	7.17-04	4.46-04	2.97-04	2.08-04	1.52-04	1.14-04	8.81-05	6.94-05	5.55-05	4.51-05	3.72-05
27	8.71-03	2.95-03	1.41-03	7.94-04	4.96-04	3.32-04	2.33-04	1.70-04	1.28-04	9.89-05	7.79-05	6.24-05	5.07-05	4.17-05
26	9.51-03	3.24-03	1.56-03	8.84-04	5.55-04	3.72-04	2.62-04	1.92-04	1.44-04	1.12-04	8.79-05	7.04-05	5.72-05	4.71-05
25	1.05-02	3.58-03	1.74-03	9.90-04	6.23-04	4.19-04	2.96-04	2.17-04	1.63-04	1.26-04	9.95-05	7.97-05	6.48-05	5.33-05
24	1.16-02	3.99-03	1.94-03	1.12-03	7.05-04	4.75-04	3.36-04	2.46-04	1.86-04	1.44-04	1.13-04	9.06-05	7.36-05	6.05-05
23	1.29-02	4.47-03	2.19-03	1.26-03	8.01-04	5.41-04	3.83-04	2.81-04	2.12-04	1.64-04	1.29-04	1.03-04	8.40-05	6.90-05
22	1.45-02	5.05-03	2.49-03	1.44-03	9.16-04	6.20-04	4.39-04	3.23-04	2.44-04	1.88-04	1.48-04	1.19-04	9.63-05	7.90-05
21	1.65-02	5.75-03	2.85-03	1.66-03	1.05-03	7.15-04	5.07-04	3.73-04	2.82-04	2.18-04	1.71-04	1.37-04	1.11-04	9.08-05
20	1.88-02	6.61-03	3.29-03	1.92-03	1.22-03	8.29-04	5.89-04	4.33-04	3.27-04	2.53-04	1.99-04	1.59-04	1.28-04	1.05-04
19	2.17-02	7.66-03	3.83-03	2.23-03	1.43-03	9.70-04	6.89-04	5.07-04	3.83-04	2.96-04	2 33-04	1.86-04	1.50-04	1.21-04
18	2.53-02	8.97-03	4.50-03	2.63-03	1.68-03	1.14-03	8.14-04	5.99-04	4.52-04	3.49-04	2.74-04	2.18-04	1.75-04	1.41-04
17	2.99-02	1.06-02	5.33-03	3.12-03	2.00-03	1.36-03	9.69-04	7.13-04	5.38-04	4.15-04	3.25-04	2.57-04	2.05-04	1.62-04
16	3.56-02	1.27-02	6.39-03	3.75-03	2.41-03	1.64-03	1.17-03	8.58-04	6.48-04	4.98-04	3.88-04	3.05-04	2.38-04	1.76-04
15	4.31-02	1.54-02	7.76-03	4.56-03	2.93-03	2.00-03	1.42-03	1.05-03	7.88-04	6.04-04	4.67-04	3.59-04	2.63-04	
14	5.29-02	1.89-02	9.56-03	5.63-03	3.62-03	2.47-03	1.76-03	1.29-03	9.69-04	7.37-04	5.59-04	4.03-04		
13	6.59-02	2.36-02	1.20-02	7.05-03	4.54-03	3.10-03	2.21-03	1.62-03	1.20-03	8.99-04	6.39-04			
12	8.38-02	3.00-02	1.53-02	9.02-03	5.82-03	3.97-03	2.82-03	2.05-03	1.50-03	1.05-03				
11	1.09-01	3.91-02	1.99-02	1.18-02	7.62-03	5.20-03	3.68-03	2.63-03	1.80-03					
10	1.45-01	5.22-02	2.67-02	1.59-02	1.03-02	6.98-03	4.86-03	3.27-03						
9	2.00-01	7.21-02	3.70-02	2.21-02	1.43-02	9.60-03	6.29-03							
8	2.87-01	1.04-01	5.36-02	3.21-02	2.06-02	1.31-02								
7	4.34-01	1.58-01	8.21-02	4.90-02	3.00-02									
6	7.08-01	2.59-01	1.35-01	7.80-02										
5	1.28+00	4.72-01	2.42-01											
4	2.76+00	1.00+00												
3	8.06+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.10-06	4.27-06	3.60-06	3.07-06	2.64-06	2.28-06	1.99-06	1.74-06	1.53-06	1.36-06	1.21-06	1.08-06	9.69-07	8.73-07
45	6.88-06	5.76-06	4.87-06	4.15-06	3.57-06	3.09-06	2.69-06	2.36-06	2.08-06	1.84-06	1.64-06	1.47-06	1.31-06	1.18-06
40	9.82-06	8.23-06	6.97-06	5.95-06	5.12-06	4.44-06	3.87-06	3.39-06	2.99-06	2.65-06	2.36-06	2.11-06	1.89-06	1.70-06
35	1.50-05	1.26-05	1.07-05	9.14-06	7.87-06	6.83-06	5.96-06	5.23-06	4.61-06	4.08-06	3.63-06	3.23-06	2.89-06	2.59-06
30	2.48-05	2.08-05	1.77-05	1.51-05	1.30-05	1.13-05	9.79-06	8.56-06	7.51-06	6.60-06	5.80-06	5.08-06	4.38-06	3.57-06
29	2.76-05	2.32-05	1.97-05	1.68-05	1.45-05	1.25-05	1.09-05	9.50-06	8.31-06	7.27-06	6.34-06	5.44-06	4.41-06	
28	3.09-05	2.60-05	2.20-05	1.88-05	1.62-05	1.40-05	1.21-05	1.05-05	9.17-06	7.96-06	6.81-06	5.49-06		
27	3.47-05	2.92-05	2.47-05	2.11-05	1.81-05	1.56-05	1.35-05	1.17-05	1.01-05	8.58-06	6.89-06			
26	3.91-05	3.29-05	2.78-05	2.37-05	2.03-05	1.74-05	1.50-05	1.29-05	1.09-05	8.71-06				
25	4.43-05	3.71-05	3.14-05	2.66-05	2.27-05	1.95-05	1.66-05	1.40-05	1.11-05					
24	5.02-05	4.20-05	3.54-05	3.00-05	2.55-05	2.16-05	1.81-05	1.43-05						
23	5.72-05	4.78-05	4.02-05	3.39-05	2.85-05	2.37-05	1.86-05							
22	6.53-05	5.44-05	4.55-05	3.80-05	3.14-05	2.45-05								
21	7.49-05	6.21-05	5.15-05	4.22-05	3.27-05									
20	8.61-05	7.07-05	5.75-05	4.42-05										
19	9.88-05	7.96-05	6.07-05											
18	1.12-04	8.48-05												
17	1.21-04													

HE + TE = 3.00+04 NE = 1.00+05 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	4.79-39	9.66-41	-9.93-39	-2.78-38	-5.30-38	-8.09-38	-1.02-37	-9.70-38	-3.99-38	1.10-37	4.08-37	9.32-37	1.78-36
45	0.00+00	7.05-39	2.06-39	-8.12-39	-2.53-38	-4.65-38	-6.24-38	-5.46-38	7.59-39	1.72-37	5.07-37	1.11-36	2.12-36	3.72-36
40	0.00+00	1.09-38	6.21-39	-2.54-39	-1.59-38	-2.75-38	-2.13-38	3.27-38	1.84-37	5.07-37	1.12-36	2.17-36	3.91-36	6.66-36
35	0.00+00	1.79-38	1.55-38	1.30-38	1.22-38	2.48-38	7.63-38	2.12-37	5.06-37	1.07-36	2.09-36	3.82-36	6.65-36	1.12-35
30	0.00+00	3.09-38	3.48-38	4.80-38	7.63-38	1.38-37	2.70-37	5.34-37	1.03-36	1.93-36	3.47-36	6.07-36	1.03-35	1.73-35
29	0.00+00	3.46-38	4.04-38	5.84-38	9.52-38	1.71-37	3.24-37	6.19-37	1.16-36	2.13-36	3.79-36	6.57-36	1.12-35	1.87-35
28	0.00+00	3.88-38	4.69-38	7.03-38	1.17-37	2.08-37	3.84-37	7.12-37	1.31-36	2.34-36	4.11-36	7.07-36	1.20-35	2.01-35
27	0.00+00	4.37-38	5.42-38	8.38-38	1.41-37	2.50-37	4.51-37	8.15-37	1.46-36	2.57-36	4.45-36	7.59-36	1.28-35	2.15-35
26	0.00+00	4.93-38	6.25-38	9.92-38	1.69-37	2.97-37	5.26-37	9.30-37	1.63-36	2.81-36	4.80-36	8.12-36	1.37-35	2.29-35
25	0.00+00	5.57-38	7.21-38	1.17-37	2.01-37	3.51-37	6.13-37	1.06-36	1.82-36	3.08-36	5.19-36	8.69-36	1.45-35	2.44-35
24	0.00+00	6.31-38	8.31-38	1.37-37	2.38-37	4.14-37	7.14-37	1.21-36	2.04-36	3.39-36	5.62-36	9.29-36	1.54-35	2.58-35
23	0.00+00	7.19-38	9.60-38	1.61-37	2.81-37	4.89-37	8.34-37	1.40-36	2.30-36	3.76-36	6.12-36	9.96-36	1.63-35	2.71-35
22	0.00+00	8.24-38	1.11-37	1.89-37	3.33-37	5.79-37	9.81-37	1.62-36	2.64-36	4.23-36	6.73-36	1.07-35	1.72-35	2.77-35
21	0.00+00	9.49-38	1.29-37	2.23-37	3.96-37	6.90-37	1.17-36	1.91-36	3.07-36	4.83-36	7.52-36	1.16-35	1.77-35	2.66-35
20	0.00+00	1.10-37	1.52-37	2.65-37	4.75-37	8.32-37	1.41-36	2.30-36	3.66-36	5.66-36	8.54-36	1.25-35	1.71-35	1.96-35
19	0.00+00	1.29-37	1.79-37	3.17-37	5.76-37	1.02-36	1.73-36	2.83-36	4.48-36	6.82-36	9.89-36	1.30-35	1.27-35	-7.40-36
18	0.00+00	1.53-37	2.14-37	3.84-37	7.07-37	1.27-36	2.18-36	3.59-36	5.68-36	8.51-36	1.16-35	1.18-35	-5.65-36	-1.18-34
17	0.00+00	1.83-37	2.59-37	4.71-37	8.85-37	1.61-36	2.82-36	4.71-36	7.49-36	1.10-35	1.31-35	2.54-36	-8.50-35	-7.33-34
16	0.00+00	2.22-37	3.18-37	5.90-37	1.13-36	2.11-36	3.77-36	6.45-36	1.03-35	1.46-35	1.18-35	-4.57-35	-5.48-34	-8.37-33
15	0.00+00	2.73-37	3.97-37	7.53-37	1.48-36	2.85-36	5.26-36	9.26-36	1.51-35	1.91-35	-9.54-36	-3.62-34	-6.66-33	
14	0.00+00	3.41-37	5.06-37	9.87-37	2.01-36	4.01-36	7.73-36	1.42-35	2.31-35	1.84-35	-1.95-34	-4.96-33		
13	0.00+00	4.36-37	6.61-37	1.33-36	2.84-36	5.96-36	1.22-35	2.35-35	3.59-35	-6.21-35	-3.38-33			
12	0.00+00	5.70-37	8.90-37	1.88-36	4.22-36	9.51-36	2.11-35	4.32-35	3.15-35	-2.01-33				
11	0.00+00	7.69-37	1.25-36	2.78-36	6.77-36	1.68-35	4.19-35	8.53-35	-9.14-34					
10	0.00+00	1.07-36	1.83-36	4.44-36	1.21-35	3.50-35	1.04-34	-1.35-34						
9	0.00+00	1.58-36	2.88-36	7.86-36	2.55-35	9.62-35	3.21-34							
8	0.00+00	2.47-36	5.01-36	1.65-35	7.35-35	4.86-34								
7	0.00+00	4.26-36	1.02-35	4.76-35	4.42-34									
6	0.00+00	8.53-36	2.82-35	2.99-34										
5	0.00+00	2.25-35	1.64-34											
4	0.00+00	1.15-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.09-36	5.04-36	7.84-36	1.18-35	1.72-35	2.46-35	3.44-35	4.75-35	6.45-35	8.65-35	1.15-34	1.51-34	1.96-34	2.53-34
45	6.17-36	9.80-36	1.51-35	2.26-35	3.31-35	4.78-35	6.80-35	9.56-35	1.33-34	1.84-34	2.53-34	3.46-34	4.71-34	6.41-34
40	1.09-35	1.72-35	2.66-35	4.04-35	6.02-35	8.88-35	1.30-34	1.89-34	2.73-34	3.95-34	5.71-34	8.29-34	1.21-33	1.79-33
35	1.82-35	2.90-35	4.56-35	7.07-35	1.09-34	1.67-34	2.55-34	3.93-34	6.09-34	9.96-34	1.53-33	2.51-33	4.27-33	7.63-33
30	2.85-35	4.66-35	7.58-35	1.23-34	2.02-34	3.36-34	5.70-34	9.97-34	1.83-33	3.59-33	7.84-33	2.03-32	7.24-32	5.67-31
29	3.09-35	5.09-35	8.38-35	1.39-34	2.32-34	3.96-34	6.96-34	1.28-33	2.52-33	5.49-33	1.42-32	5.05-32	3.93-31	
28	3.34-35	5.55-35	9.26-35	1.56-34	2.68-34	4.73-34	8.71-34	1.71-33	3.73-33	9.60-33	3.39-32	2.62-31		
27	3.60-35	6.04-35	1.02-34	1.76-34	3.12-34	5.76-34	1.13-33	2.45-33	6.23-33	2.19-32	1.68-31			
26	3.86-35	6.57-35	1.13-34	2.01-34	3.70-34	7.24-34	1.56-33	3.93-33	1.35-32	1.01-31				
25	4.14-35	7.12-35	1.26-34	2.30-34	4.45-34	9.44-34	2.34-33	7.81-33	5.69-32					
24	4.39-35	7.65-35	1.38-34	2.62-34	5.40-34	1.28-33	4.06-33	2.77-32						
23	4.58-35	7.99-35	1.45-34	2.83-34	6.16-34	1.69-33	9.27-33							
22	4.56-35	7.63-35	1.30-34	2.18-34	2.79-34	-1.71-33								
21	3.81-35	4.55-35	-1.33-37	-4.96-34	-7.79-33									
20	5.56-36	-1.02-34	-8.53-34	-1.07-32										
19	-1.31-34	-9.46-34	-1.15-32											
18	-8.82-34	-1.11-32												
17	-9.93-33													

HE + TE = 3.00+04 NE = 1.00+06 CASE B NC = 70

TOTAL RC = 6.573-13 4-3 RC = 1.069-13 4-3 EM = 4.532-25 2S RC = 2.059-13 2P RC = 4.514-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.76-03	8.47-04	3.64-04	1.89-04	1.10-04	6.99-05	4.71-05	3.32-05	2.43-05	1.83-05	1.41-05	1.11-05	8.93-06	7.27-06
45	3.50-03	1.08-03	4.64-04	2.41-04	1.41-04	8.92-05	6.01-05	4.24-05	3.10-05	2.34-05	1.81-05	1.42-05	1.14-05	9.30-06
40	4.59-03	1.41-03	6.10-04	3.17-04	1.85-04	1.18-04	7.94-05	5.61-05	4.11-05	3.10-05	2.40-05	1.89-05	1.52-05	1.24-05
35	6.32-03	1.95-03	8.47-04	4.42-04	2.60-04	1.65-04	1.12-04	7.92-05	5.81-05	4.39-05	3.40-05	2.68-05	2.16-05	1.76-05
30	9.11-03	2.85-03	1.25-03	6.60-04	3.91-04	2.51-04	1.71-04	1.22-04	8.96-05	6.80-05	5.28-05	4.18-05	3.37-05	2.75-05
29	9.84-03	3.09-03	1.36-03	7.21-04	4.28-04	2.75-04	1.88-04	1.34-04	9.89-05	7.51-05	5.84-05	4.63-05	3.73-05	3.05-05
28	1.06-02	3.36-03	1.49-03	7.90-04	4.71-04	3.04-04	2.08-04	1.48-04	1.10-04	8.34-05	6.49-05	5.15-05	4.15-05	3.40-05
27	1.15-02	3.65-03	1.63-03	8.68-04	5.19-04	3.36-04	2.30-04	1.65-04	1.22-04	9.30-05	7.25-05	5.76-05	4.65-05	3.81-05
26	1.25-02	3.99-03	1.78-03	9.58-04	5.76-04	3.74-04	2.57-04	1.84-04	1.37-04	1.04-04	8.15-05	6.48-05	5.23-05	4.29-05
25	1.36-02	4.36-03	1.97-03	1.06-03	6.42-04	4.18-04	2.88-04	2.07-04	1.54-04	1.18-04	9.21-05	7.33-05	5.93-05	4.86-05
24	1.48-02	4.79-03	2.18-03	1.18-03	7.19-04	4.71-04	3.26-04	2.35-04	1.75-04	1.34-04	1.05-04	8.35-05	6.75-05	5.54-05
23	1.61-02	5.28-03	2.43-03	1.33-03	8.12-04	5.34-04	3.70-04	2.68-04	2.00-04	1.53-04	1.20-04	9.57-05	7.74-05	6.34-05
22	1.77-02	5.86-03	2.72-03	1.50-03	9.23-04	6.09-04	4.24-04	3.08-04	2.30-04	1.77-04	1.38-04	1.10-04	8.93-05	7.31-05
21	1.96-02	6.55-03	3.07-03	1.71-03	1.06-03	7.01-04	4.90-04	3.56-04	2.67-04	2.05-04	1.61-04	1.28-04	1.04-04	8.47-05
20	2.19-02	7.38-03	3.50-03	1.96-03	1.22-03	8.14-04	5.70-04	4.15-04	3.11-04	2.39-04	1.88-04	1.50-04	1.21-04	9.85-05
19	2.47-02	8.40-03	4.02-03	2.28-03	1.42-03	9.53-04	6.69-04	4.88-04	3.67-04	2.82-04	2.21-04	1.76-04	1.42-04	1.15-04
18	2.82-02	9.65-03	4.67-03	2.67-03	1.68-03	1.13-03	7.93-04	5.79-04	4.35-04	3.34-04	2.62-04	2.08-04	1.66-04	1.34-04
17	3.26-02	1.12-02	5.50-03	3.16-03	1.99-03	1.34-03	9.48-04	6.93-04	5.20-04	3.99-04	3.12-04	2.46-04	1.96-04	1.55-04
16	3.82-02	1.33-02	6.55-03	3.79-03	2.40-03	1.62-03	1.14-03	8.37-04	6.28-04	4.81-04	3.74-04	2.93-04	2.28-04	1.69-04
15	4.55-02	1.59-02	7.92-03	4.60-03	2.93-03	1.98-03	1.40-03	1.02-03	7.65-04	5.84-04	4.50-04	3.46-04	2.53-04	
14	5.52-02	1.94-02	9.72-03	5.67-03	3.62-03	2.45-03	1.73-03	1.26-03	9.42-04	7.13-04	5.39-04	3.89-04		
13	6.82-02	2.42-02	1.21-02	7.10-03	4.54-03	3.08-03	2.17-03	1.58-03	1.17-03	8.70-04	6.16-04			
12	8.61-02	3.07-02	1.55-02	9.07-03	5.81-03	3.94-03	2.78-03	2.01-03	1.46-03	1.02-03				
11	1.11-01	3.98-02	2.01-02	1.19-02	7.60-03	5.15-03	3.61-03	2.56-03	1.75-03					
10	1.48-01	5.31-02	2.70-02	1.59-02	1.02-02	6.89-03	4.75-03	3.17-03						
9	2.04-01	7.33-02	3.74-02	2.21-02	1.42-02	9.43-03	6.11-03							
8	2.92-01	1.05-01	5.41-02	3.20-02	2.03-02	1.28-02								
7	4.42-01	1.60-01	8.26-02	4.88-02	2.93-02									
6	7.21-01	2.62-01	1.36-01	7.68-02										
5	1.31+00	4.77-01	2.40-01											
4	2.81+00	1.00+00												
3	8.14+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.00-06	5.01-06	4.22-06	3.59-06	3.08-06	2.66-06	2.32-06	2.03-06	1.79-06	1.58-06	1.41-06	1.26-06	1.13-06	1.01-06
45	7.67-06	6.41-06	5.40-06	4.60-06	3.94-06	3.41-06	2.97-06	2.60-06	2.29-06	2.02-06	1.80-06	1.61-06	1.44-06	1.29-06
40	1.02-05	8.51-06	7.18-06	6.11-06	5.25-06	4.53-06	3.95-06	3.45-06	3.04-06	2.69-06	2.39-06	2.13-06	1.91-06	1.72-06
35	1.45-05	1.21-05	1.02-05	8.72-06	7.49-06	6.47-06	5.63-06	4.93-06	4.33-06	3.83-06	3.40-06	3.03-06	2.70-06	2.42-06
30	2.28-05	1.91-05	1.61-05	1.37-05	1.18-05	1.02-05	8.84-06	7.72-06	6.77-06	5.95-06	5.24-06	4.59-06	3.97-06	3.25-06
29	2.53-05	2.11-05	1.79-05	1.52-05	1.31-05	1.13-05	9.80-06	8.55-06	7.48-06	6.55-06	5.72-06	4.93-06	4.02-06	
28	2.81-05	2.36-05	1.99-05	1.70-05	1.46-05	1.26-05	1.09-05	9.49-06	8.28-06	7.20-06	6.18-06	5.01-06		
27	3.15-05	2.64-05	2.23-05	1.90-05	1.63-05	1.41-05	1.22-05	1.06-05	9.14-06	7.81-06	6.31-06			
26	3.55-05	2.98-05	2.51-05	2.14-05	1.83-05	1.58-05	1.36-05	1.17-05	9.97-06	8.01-06				
25	4.03-05	3.37-05	2.85-05	2.42-05	2.07-05	1.77-05	1.52-05	1.29-05	1.03-05					
24	4.59-05	3.84-05	3.24-05	2.75-05	2.34-05	1.99-05	1.67-05	1.33-05						
23	5.26-05	4.39-05	3.70-05	3.12-05	2.64-05	2.21-05	1.74-05							
22	6.05-05	5.05-05	4.23-05	3.55-05	2.94-05	2.31-05								
21	6.99-05	5.81-05	4.83-05	3.97-05	3.10-05									
20	8.10-05	6.67-05	5.44-05	4.21-05										
19	9.37-05	7.57-05	5.80-05											
18	1.07-04	8.12-05												
17	1.16-04													

HE + TE = 3.00+04 NE = 1.00+06 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	3.57-39	-5.29-39	-2.68-38	-7.04-38	-1.47-37	-2.69-37	-4.51-37	-7.11-37	-1.07-36	-1.56-36	-2.21-36	-3.02-36	-4.28-36
45	0.00+00	5.62-39	-4.25-39	-2.75-38	-7.37-38	-1.52-37	-2.70-37	-4.37-37	-6.58-37	-9.41-37	-1.29-36	-1.73-36	-2.27-36	-2.96-36
40	0.00+00	9.04-39	-1.76-39	-2.61-38	-7.23-38	-1.45-37	-2.44-37	-3.61-37	-4.79-37	-5.68-37	-5.82-37	-4.60-37	-1.23-37	5.21-37
35	0.00+00	1.49-38	3.06-39	-2.22-38	-6.71-38	-1.29-37	-1.92-37	-2.21-37	-1.52-37	1.17-37	7.45-37	1.97-36	4.11-36	7.65-36
30	0.00+00	2.62-38	1.46-38	-8.03-39	-4.38-38	-7.72-38	-6.55-38	7.67-38	5.02-37	1.47-36	3.38-36	6.92-36	1.31-35	2.36-35
29	0.00+00	2.97-38	1.87-38	-1.75-39	-3.26-38	-5.41-38	-1.59-38	1.83-37	7.22-37	1.91-36	4.24-36	8.53-36	1.61-35	2.90-35
28	0.00+00	3.38-38	2.39-38	6.53-39	-1.74-38	-2.37-38	4.75-38	3.14-37	9.89-37	2.44-36	5.26-36	1.05-35	1.97-35	3.57-35
27	0.00+00	3.87-38	3.03-38	1.73-38	2.70-39	1.59-38	1.28-37	4.76-37	1.31-36	3.07-36	6.49-36	1.28-35	2.42-35	4.41-35
26	0.00+00	4.44-38	3.83-38	3.11-38	2.87-38	6.66-38	2.27-37	6.73-37	1.70-36	3.82-36	7.95-36	1.56-35	2.96-35	5.45-35
25	0.00+00	5.13-38	4.81-38	4.87-38	6.19-38	1.30-37	3.51-37	9.11-37	2.16-36	4.72-36	9.68-36	1.90-35	3.62-35	6.76-35
24	0.00+00	5.95-38	6.01-38	7.06-38	1.03-37	2.09-37	5.00-37	1.20-36	2.70-36	5.76-36	1.17-35	2.31-35	4.43-35	8.43-35
23	0.00+00	6.92-38	7.48-38	9.77-38	1.55-37	3.06-37	6.80-37	1.53-36	3.34-36	6.98-36	1.41-35	2.79-35	5.44-35	1.06-34
22	0.00+00	8.08-38	9.25-38	1.31-37	2.18-37	4.24-37	8.95-37	1.93-36	4.07-36	8.40-36	1.70-35	3.38-35	6.70-35	1.34-34
21	0.00+00	9.48-38	1.14-37	1.72-37	2.95-37	5.66-37	1.15-36	2.39-36	4.93-36	1.01-35	2.03-35	4.09-35	8.33-35	1.74-34
20	0.00+00	1.11-37	1.40-37	2.21-37	3.89-37	7.39-37	1.46-36	2.94-36	5.95-36	1.20-35	2.44-35	5.00-35	1.05-34	2.31-34
19	0.00+00	1.32-37	1.71-37	2.81-37	5.05-37	9.51-37	1.84-36	3.61-36	7.17-36	1.44-35	2.93-35	6.14-35	1.35-34	3.20-34
18	0.00+00	1.57-37	2.10-37	3.56-37	6.48-37	1.22-36	2.31-36	4.45-36	8.68-36	1.73-35	3.55-35	7.69-35	1.78-34	4.69-34
17	0.00+00	1.88-37	2.58-37	4.49-37	8.31-37	1.56-36	2.93-36	5.55-36	1.07-35	2.11-35	4.36-35	9.63-35	2.38-34	7.20-34
16	0.00+00	2.27-37	3.18-37	5.70-37	1.07-36	2.02-36	3.79-36	7.10-36	1.35-35	2.63-35	5.35-35	1.16-34	2.60-34	7.13-35
15	0.00+00	2.78-37	3.98-37	7.32-37	1.41-36	2.69-36	5.06-36	9.46-36	1.77-35	3.31-35	6.92-35	1.52-35	-1.49-33	
14	0.00+00	3.47-37	5.06-37	9.57-37	1.89-36	3.70-36	7.11-36	1.34-35	2.44-35	4.86-35	-1.06-35	-1.90-33		
13	0.00+00	4.41-37	6.59-37	1.29-36	2.65-36	5.38-36	1.07-35	2.05-35	3.44-35	-3.76-36	-1.70-33			
12	0.00+00	5.75-37	8.83-37	1.80-36	3.90-36	8.40-36	1.77-35	3.47-35	2.88-35	-1.22-33				
11	0.00+00	7.73-37	1.23-36	2.66-36	6.18-36	1.45-35	3.37-35	6.04-35	-6.63-34					
10	0.00+00	1.08-36	1.80-36	4.21-36	1.09-35	2.94-35	7.78-35	-1.70-34						
9	0.00+00	1.58-36	2.83-36	7.41-36	2.27-35	7.76-35	1.82-34							
8	0.00+00	2.48-36	4.91-36	1.54-35	6.37-35	3.55-34								
7	0.00+00	4.27-36	1.00-35	4.39-35	3.63-34									
6	0.00+00	8.54-36	2.74-35	2.67-34										
5	0.00+00	2.25-35	1.57-34											
4	0.00+00	1.15-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.92-36	-8.19-36	-1.14-35	-1.59-35	-2.23-35	-3.15-35	-4.46-35	-6.32-35	-8.95-35	-1.27-34	-1.78-34	-2.51-34	-3.51-34	-4.90-34
45	-3.88-36	-5.19-36	-7.12-36	-1.01-35	-1.48-35	-2.21-35	-3.35-35	-5.14-35	-7.87-35	-1.20-34	-1.83-34	-2.77-34	-4.18-34	-6.28-34
40	1.57-36	3.09-36	5.13-36	7.59-36	1.02-35	1.24-35	1.28-35	9.35-36	-1.65-36	-2.65-35	-7.57-35	-1.68-34	-3.34-34	-6.31-34
35	1.32-35	2.17-35	3.43-35	5.25-35	7.85-35	1.15-34	1.65-34	2.34-34	3.28-34	4.54-34	6.23-34	8.43-34	1.12-33	1.40-33
30	4.08-35	6.91-35	1.15-34	1.89-34	3.11-34	5.13-34	8.58-34	1.47-33	2.62-33	4.96-33	1.04-32	2.56-32	8.65-32	6.31-31
29	5.07-35	8.68-35	1.47-34	2.47-34	4.18-34	7.16-34	1.26-33	2.29-33	4.44-33	9.50-33	2.40-32	8.33-32	6.28-31	
28	6.31-35	1.10-34	1.90-34	3.28-34	5.74-34	1.03-33	1.91-33	3.79-33	8.27-33	2.13-32	7.55-32	5.82-31		
27	7.89-35	1.40-34	2.47-34	4.42-34	8.09-34	1.54-33	3.10-33	6.89-33	1.81-32	6.50-32	5.09-31			
26	9.91-35	1.80-34	3.28-34	6.12-34	1.18-33	2.43-33	5.49-33	1.46-32	5.34-32	4.23-31				
25	1.26-34	2.34-34	4.45-34	8.76-34	1.83-33	4.19-33	1.13-32	4.18-32	3.34-31					
24	1.61-34	3.11-34	6.22-34	1.32-33	3.06-33	8.37-33	3.11-32	2.50-31						
23	2.09-34	4.24-34	9.10-34	2.14-33	5.89-33	2.20-32	1.77-31							
22	2.77-34	6.01-34	1.33-33	3.95-33	1.48-32	1.18-31								
21	3.81-34	9.08-34	2.52-33	9.38-33	7.37-32									
20	5.53-34	1.53-33	5.62-33	4.30-32										
19	8.73-34	3.13-33	2.29-32											
18	1.60-33	1.06-32												
17	3.66-33													

HE + TE = 3.00+04 NE = 1.00+07 CASE B NC = 59

TOTAL RC = 6.609-13 4-3 RC = 1.050-13 4-3 EM = 4.452-25 2S RC = 2.080-13 2P RC = 4.529-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.27-03	1.00-03	4.31-04	2.23-04	1.30-04	8.25-05	5.55-05	3.91-05	2.86-05	2.15-05	1.66-05	1.31-05	1.05-05	8.55-06
45	4.32-03	1.33-03	5.70-04	2.95-04	1.72-04	1.09-04	7.35-05	5.18-05	3.79-05	2.85-05	2.20-05	1.73-05	1.39-05	1.13-05
40	5.79-03	1.78-03	7.64-04	3.96-04	2.31-04	1.46-04	9.85-05	6.94-05	5.08-05	3.82-05	2.95-05	2.32-05	1.86-05	1.52-05
35	7.86-03	2.41-03	1.04-03	5.38-04	3.14-04	1.99-04	1.34-04	9.46-05	6.92-05	5.21-05	4.02-05	3.17-05	2.54-05	2.07-05
30	1.11-02	3.41-03	1.47-03	7.62-04	4.46-04	2.83-04	1.91-04	1.34-04	9.84-05	7.42-05	5.73-05	4.51-05	3.62-05	2.94-05
29	1.20-02	3.68-03	1.59-03	8.25-04	4.83-04	3.07-04	2.07-04	1.46-04	1.07-04	8.05-05	6.22-05	4.90-05	3.93-05	3.20-05
28	1.30-02	4.00-03	1.73-03	8.98-04	5.26-04	3.34-04	2.25-04	1.59-04	1.16-04	8.78-05	6.78-05	5.35-05	4.29-05	3.49-05
27	1.42-02	4.37-03	1.89-03	9.82-04	5.75-04	3.66-04	2.47-04	1.74-04	1.28-04	9.63-05	7.44-05	5.87-05	4.71-05	3.83-05
26	1.55-02	4.79-03	2.07-03	1.08-03	6.33-04	4.03-04	2.72-04	1.92-04	1.41-04	1.06-04	8.22-05	6.48-05	5.20-05	4.23-05
25	1.70-02	5.27-03	2.29-03	1.19-03	7.01-04	4.46-04	3.02-04	2.13-04	1.57-04	1.18-04	9.14-05	7.21-05	5.78-05	4.71-05
24	1.88-02	5.83-03	2.53-03	1.33-03	7.79-04	4.97-04	3.37-04	2.38-04	1.75-04	1.32-04	1.02-04	8.07-05	6.48-05	5.27-05
23	2.08-02	6.47-03	2.82-03	1.48-03	8.72-04	5.57-04	3.78-04	2.68-04	1.97-04	1.49-04	1.15-04	9.10-05	7.31-05	5.95-05
22	2.31-02	7.21-03	3.15-03	1.66-03	9.82-04	6.29-04	4.27-04	3.03-04	2.23-04	1.69-04	1.31-04	1.03-04	8.31-05	6.76-05
21	2.57-02	8.06-03	3.55-03	1.87-03	1.11-03	7.15-04	4.87-04	3.46-04	2.55-04	1.94-04	1.50-04	1.19-04	9.53-05	7.75-05
20	2.87-02	9.05-03	4.01-03	2.13-03	1.27-03	8.19-04	5.59-04	3.99-04	2.95-04	2.24-04	1.74-04	1.37-04	1.10-04	8.96-05
19	3.21-02	1.02-02	4.56-03	2.44-03	1.46-03	9.47-04	6.49-04	4.64-04	3.44-04	2.61-04	2.03-04	1.61-04	1.29-04	1.04-04
18	3.61-02	1.16-02	5.23-03	2.82-03	1.70-03	1.11-03	7.62-04	5.47-04	4.05-04	3.09-04	2.40-04	1.90-04	1.52-04	1.22-04
17	4.09-02	1.33-02	6.05-03	3.29-03	2.00-03	1.31-03	9.05-04	6.52-04	4.84-04	3.69-04	2.87-04	2.26-04	1.80-04	1.42-04
16	4.67-02	1.53-02	7.09-03	3.90-03	2.39-03	1.57-03	1.09-03	7.87-04	5.86-04	4.46-04	3.46-04	2.71-04	2.12-04	1.68-04
15	5.41-02	1.80-02	8.43-03	4.69-03	2.89-03	1.92-03	1.33-03	9.64-04	7.17-04	5.45-04	4.20-04	3.23-04	2.37-04	
14	6.36-02	2.14-02	1.02-02	5.73-03	3.57-03	2.37-03	1.66-03	1.20-03	8.89-04	6.71-04	5.07-04	3.67-04		
13	7.64-02	2.60-02	1.26-02	7.15-03	4.48-03	2.99-03	2.09-03	1.51-03	1.11-03	8.24-04	5.85-04			
12	9.40-02	3.24-02	1.59-02	9.11-03	5.74-03	3.84-03	2.68-03	1.92-03	1.39-03	9.67-04				
11	1.19-01	4.15-02	2.06-02	1.19-02	7.52-03	5.03-03	3.49-03	2.46-03	1.67-03					
10	1.56-01	5.49-02	2.74-02	1.60-02	1.01-02	6.73-03	4.59-03	3.04-03						
9	2.12-01	7.53-02	3.79-02	2.21-02	1.40-02	9.18-03	5.88-03							
8	3.02-01	1.08-01	5.47-02	3.19-02	1.99-02	1.23-02								
7	4.56-01	1.64-01	8.32-02	4.83-02	2.85-02									
6	7.41-01	2.67-01	1.36-01	7.51-02										
5	1.34+00	4.83-01	2.37-01											
4	2.88+00	1.00+00												
3	8.28+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.05-06	5.88-06	4.96-06	4.22-06	3.62-06	3.13-06	2.72-06	2.38-06	2.09-06	1.85-06	1.65-06	1.47-06	1.32-06	1.19-06
45	9.32-06	7.78-06	6.56-06	5.58-06	4.78-06	4.13-06	3.59-06	3.14-06	2.77-06	2.45-06	2.17-06	1.94-06	1.74-06	1.56-06
40	1.25-05	1.04-05	8.79-06	7.48-06	6.41-06	5.54-06	4.81-06	4.21-06	3.70-06	3.27-06	2.91-06	2.59-06	2.32-06	2.08-06
35	1.70-05	1.42-05	1.20-05	1.02-05	8.73-06	7.53-06	6.55-06	5.72-06	5.03-06	4.44-06	3.93-06	3.50-06	3.12-06	2.80-06
30	2.43-05	2.02-05	1.70-05	1.45-05	1.24-05	1.07-05	9.27-06	8.08-06	7.07-06	6.21-06	5.46-06	4.78-06	4.13-06	3.38-06
29	2.64-05	2.20-05	1.85-05	1.57-05	1.34-05	1.16-05	1.00-05	8.74-06	7.63-06	6.68-06	5.82-06	5.01-06	4.08-06	
28	2.88-05	2.40-05	2.02-05	1.71-05	1.47-05	1.26-05	1.09-05	9.49-06	8.25-06	7.17-06	6.14-06	4.98-06		
27	3.16-05	2.63-05	2.22-05	1.88-05	1.61-05	1.38-05	1.19-05	1.03-05	8.92-06	7.61-06	6.14-06			
26	3.49-05	2.91-05	2.45-05	2.07-05	1.77-05	1.52-05	1.31-05	1.12-05	9.54-06	7.66-06				
25	3.88-05	3.23-05	2.72-05	2.30-05	1.96-05	1.68-05	1.43-05	1.21-05	9.68-06					
24	4.34-05	3.62-05	3.04-05	2.57-05	2.18-05	1.85-05	1.56-05	1.28-05						
23	4.90-05	4.08-05	3.42-05	2.88-05	2.43-05	2.03-05	1.60-05							
22	5.57-05	4.62-05	3.87-05	3.24-05	2.68-05	2.11-05								
21	6.37-05	5.28-05	4.38-05	3.61-05	2.82-05									
20	7.35-05	6.04-05	4.94-05	3.83-05										
19	8.50-05	6.88-05	5.29-05											
18	9.79-05	7.46-05												
17	1.07-04													

HE + TE = 3.00+04 NE = 1.00+07 CASE B NC = 59

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	2.50-39	-1.03-38	-4.27-38	-1.12-37	-2.42-37	-4.63-37	-8.20-37	-1.37-36	-2.21-36	-3.45-36	-5.27-36	-7.90-36	-1.17-35
45	0.00+00	3.84-39	-1.24-38	-5.38-38	-1.42-37	-3.07-37	-5.88-37	-1.04-36	-1.75-36	-2.83-36	-4.44-36	-6.83-36	-1.04-35	-1.55-35
40	0.00+00	6.38-39	-1.39-38	-6.51-38	-1.74-37	-3.76-37	-7.19-37	-1.27-36	-2.14-36	-3.46-36	-5.46-36	-8.48-36	-1.30-35	-1.99-35
35	0.00+00	1.15-38	-1.25-38	-7.19-38	-1.96-37	-4.22-37	-7.99-37	-1.39-36	-2.31-36	-3.71-36	-5.85-36	-9.15-36	-1.43-35	-2.24-35
30	0.00+00	2.20-38	-4.60-39	-6.77-38	-1.95-37	-4.11-37	-7.44-37	-1.22-36	-1.89-36	-2.83-36	-4.20-36	-6.34-36	-9.91-36	-1.62-35
29	0.00+00	2.52-38	-1.95-39	-6.54-38	-1.91-37	-4.02-37	-7.15-37	-1.14-36	-1.71-36	-2.45-36	-3.47-36	-5.03-36	-7.70-36	-1.27-35
28	0.00+00	2.88-38	1.17-39	-6.27-38	-1.88-37	-3.91-37	-6.80-37	-1.05-36	-1.49-36	-1.98-36	-2.55-36	-3.35-36	-4.79-36	-7.89-36
27	0.00+00	3.30-38	4.87-39	-5.93-38	-1.83-37	-3.78-37	-6.39-37	-9.39-37	-1.22-36	-1.40-36	-1.40-36	-1.19-36	-9.53-37	-1.35-36
26	0.00+00	3.80-38	9.34-39	-5.50-38	-1.77-37	-3.61-37	-5.89-37	-8.03-37	-8.92-37	-6.83-37	6.47-38	1.62-36	4.21-36	7.76-36
25	0.00+00	4.39-38	1.49-38	-4.92-38	-1.68-37	-3.39-37	-5.25-37	-6.30-37	-4.76-37	2.38-37	1.97-36	5.38-36	1.13-35	2.09-35
24	0.00+00	5.10-38	2.19-38	-4.10-38	-1.55-37	-3.07-37	-4.37-37	-4.03-37	6.83-38	1.45-36	4.54-36	1.06-35	2.15-35	4.04-35
23	0.00+00	5.96-38	3.11-38	-2.91-38	-1.34-37	-2.60-37	-3.15-37	-9.51-38	8.02-37	3.10-36	8.09-36	1.80-35	3.66-35	7.09-35
22	0.00+00	7.02-38	4.32-38	-1.18-38	-1.03-37	-1.89-37	-1.41-37	3.32-37	1.81-36	5.39-36	1.31-35	2.88-35	5.97-35	1.21-34
21	0.00+00	8.33-38	5.93-38	1.34-38	-5.55-38	-8.42-38	1.08-37	9.28-37	3.21-36	8.61-36	2.04-35	4.51-35	9.66-35	2.06-34
20	0.00+00	9.98-38	8.08-38	4.99-38	1.47-38	6.83-38	4.61-37	1.76-36	5.18-36	1.32-35	3.11-35	7.05-35	1.58-34	3.65-34
19	0.00+00	1.21-37	1.10-37	1.01-37	1.16-37	2.87-37	9.57-37	2.92-36	7.93-36	1.98-35	4.74-35	1.12-34	2.69-34	6.89-34
18	0.00+00	1.47-37	1.48-37	1.52-37	2.60-37	5.94-37	1.65-36	4.53-36	1.18-35	2.96-35	7.29-35	1.82-34	4.85-34	1.48-33
17	0.00+00	1.81-37	2.00-37	2.70-37	4.61-37	1.02-36	2.60-36	6.79-36	1.74-35	4.44-35	1.15-34	3.15-34	9.86-34	4.08-33
16	0.00+00	2.24-37	2.68-37	4.05-37	7.40-37	1.62-36	3.93-36	9.95-36	2.57-35	6.78-35	1.90-34	6.05-34	2.53-33	2.17-32
15	0.00+00	2.81-37	3.59-37	5.88-37	1.12-36	2.44-36	5.79-36	1.45-35	3.82-35	1.08-34	3.44-34	1.43-33	1.19-32	
14	0.00+00	3.55-37	4.80-37	8.40-37	1.66-36	3.62-36	8.51-36	2.15-35	5.90-35	1.85-34	7.44-34	5.76-33		
13	0.00+00	4.55-37	6.46-37	1.19-36	2.45-36	5.39-36	1.27-35	3.30-35	9.72-35	3.62-34	2.38-33			
12	0.00+00	5.93-37	8.81-37	1.72-36	3.55-36	8.29-36	2.01-35	5.43-35	1.76-34	7.67-34				
11	0.00+00	7.94-37	1.23-36	2.54-36	5.75-36	1.37-35	3.53-35	1.00-34	1.81-34					
10	0.00+00	1.10-36	1.79-36	3.99-36	9.88-36	2.62-35	7.42-35	8.06-35						
9	0.00+00	1.60-36	2.79-36	6.93-36	1.99-35	6.42-35	1.65-34							
8	0.00+00	2.50-36	4.80-36	1.42-35	5.36-35	2.61-34								
7	0.00+00	4.29-36	9.68-36	3.93-35	2.84-34									
6	0.00+00	8.57-36	2.62-35	2.29-34										
5	0.00+00	2.25-35	1.46-34											
4	0.00+00	1.14-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.71-35	-2.46-35	-3.51-35	-4.95-35	-6.90-35	-9.52-35	-1.30-34	-1.76-34	-2.38-34	-3.17-34	-4.21-34	-5.56-34	-7.29-34	-9.50-34
45	-2.30-35	-3.37-35	-4.89-35	-7.04-35	-1.00-34	-1.42-34	-1.99-34	-2.77-34	-3.84-34	-5.30-34	-7.29-34	-9.99-34	-1.37-33	-1.86-33
40	-3.01-35	-4.53-35	-6.77-35	-1.00-34	-1.48-34	-2.17-34	-3.18-34	-4.63-34	-6.74-34	-9.81-34	-1.43-33	-2.10-33	-3.09-33	-4.59-33
35	-3.52-35	-5.54-35	-8.71-35	-1.37-34	-2.15-34	-3.37-34	-5.29-34	-8.37-34	-1.34-33	-2.16-33	-3.56-33	-6.02-33	-1.05-32	-1.93-32
30	-2.75-35	-4.80-35	-8.52-35	-1.53-34	-2.77-34	-5.06-34	-9.45-34	-1.82-33	-3.66-33	-7.91-33	-1.90-32	-5.42-32	-2.13-31	-1.85-30
29	-2.22-35	-4.08-35	-7.67-35	-1.46-34	-2.80-34	-5.44-34	-1.08-33	-2.25-33	-5.00-33	-1.23-32	-3.60-32	-1.45-31	-1.20-30	
28	-1.48-35	-3.00-35	-6.24-35	-1.30-34	-2.72-34	-5.71-34	-1.26-33	-2.91-33	-7.42-33	-2.24-32	-9.32-32	-8.53-31		
27	-4.19-36	-1.36-35	-3.85-35	-9.95-35	-2.44-34	-5.92-34	-1.48-33	-4.00-33	-1.27-32	-5.50-32	-5.23-31			
26	1.13-35	1.20-35	1.89-36	-3.98-35	-1.68-34	-5.47-34	-1.73-33	-6.09-33	-2.85-32	-2.88-31				
25	3.48-35	5.33-35	7.32-35	8.06-35	2.45-35	-2.94-34	-1.82-33	-1.10-32	-1.29-31					
24	7.20-35	1.24-34	2.07-34	3.42-34	5.48-34	7.89-34	3.93-35	-2.64-32						
23	1.34-34	2.51-34	4.82-34	9.75-34	2.22-33	6.41-33	3.50-32							
22	2.43-34	5.03-34	1.11-33	2.82-33	9.52-33	6.75-32								
21	4.52-34	1.06-33	2.86-33	1.03-32	7.96-32									
20	8.97-34	2.58-33	9.62-33	7.76-32										
19	2.03-33	7.97-33	6.65-32											
18	5.98-33	5.09-32												
17	3.51-32													

HE + TE = 3.00+04 NE = 1.00+08 CASE B NC = 37

TOTAL RC = 6.679-13 4-3 RC = 1.025-13 4-3 FM = 4.343-25 2S RC = 2.116-13 2P RC = 4.563-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.51-03	1.08-03	4.63-04	2.40-04	1.40-04	8.87-05	5.97-05	4.21-05	3.08-05	2.32-05	1.79-05	1.41-05	1.13-05	9.19-06
45	4.79-03	1.47-03	6.31-04	3.27-04	1.91-04	1.21-04	8.13-05	5.73-05	4.19-05	3.15-05	2.43-05	1.92-05	1.54-05	1.25-05
40	6.71-03	2.06-03	8.85-04	4.58-04	2.67-04	1.69-04	1.14-04	8.03-05	5.87-05	4.42-05	3.41-05	2.68-05	2.15-05	1.75-05
35	9.66-03	2.96-03	1.27-03	6.60-04	3.85-04	2.44-04	1.64-04	1.16-04	8.44-05	6.36-05	4.90-05	3.86-05	3.09-05	2.52-05
30	1.43-02	4.38-03	1.88-03	9.74-04	5.68-04	3.60-04	2.42-04	1.71-04	1.25-04	9.38-05	7.24-05	5.70-05	4.56-05	3.71-05
29	1.54-02	4.74-03	2.04-03	1.06-03	6.16-04	3.90-04	2.62-04	1.85-04	1.35-04	1.02-04	7.84-05	6.17-05	4.94-05	4.02-05
28	1.67-02	5.14-03	2.21-03	1.14-03	6.68-04	4.23-04	2.84-04	2.00-04	1.46-04	1.10-04	8.50-05	6.69-05	5.35-05	4.35-05
27	1.82-02	5.57-03	2.40-03	1.24-03	7.24-04	4.59-04	3.09-04	2.17-04	1.59-04	1.20-04	9.22-05	7.25-05	5.81-05	4.72-05
26	1.97-02	6.05-03	2.60-03	1.35-03	7.87-04	4.98-04	3.35-04	2.36-04	1.73-04	1.30-04	1.00-04	7.88-05	6.31-05	5.12-05
25	2.15-02	6.59-03	2.83-03	1.47-03	8.57-04	5.43-04	3.65-04	2.57-04	1.88-04	1.41-04	1.09-04	8.58-05	6.87-05	5.58-05
24	2.34-02	7.19-03	3.09-03	1.60-03	9.36-04	5.93-04	3.99-04	2.81-04	2.05-04	1.55-04	1.19-04	9.37-05	7.50-05	6.09-05
23	2.57-02	7.88-03	3.39-03	1.76-03	1.03-03	6.51-04	4.38-04	3.09-04	2.26-04	1.70-04	1.31-04	1.03-04	8.23-05	6.68-05
22	2.83-02	8.69-03	3.74-03	1.94-03	1.13-03	7.19-04	4.84-04	3.41-04	2.49-04	1.88-04	1.45-04	1.14-04	9.09-05	7.37-05
21	3.14-02	9.66-03	4.16-03	2.16-03	1.26-03	8.01-04	5.39-04	3.80-04	2.78-04	2.09-04	1.61-04	1.27-04	1.01-04	8.19-05
20	3.51-02	1.08-02	4.67-03	2.43-03	1.42-03	9.01-04	6.07-04	4.28-04	3.13-04	2.35-04	1.81-04	1.42-04	1.14-04	9.18-05
19	3.96-02	1.22-02	5.29-03	2.75-03	1.61-03	1.02-03	6.90-04	4.87-04	3.56-04	2.68-04	2.06-04	1.62-04	1.29-04	1.04-04
18	4.51-02	1.39-02	6.04-03	3.15-03	1.85-03	1.18-03	7.93-04	5.60-04	4.10-04	3.08-04	2.37-04	1.86-04	1.48-04	1.18-04
17	5.17-02	1.60-02	6.97-03	3.65-03	2.14-03	1.37-03	9.23-04	6.52-04	4.77-04	3.59-04	2.76-04	2.16-04	1.70-04	1.34-04
16	5.97-02	1.86-02	8.12-03	4.26-03	2.51-03	1.61-03	1.09-03	7.70-04	5.64-04	4.24-04	3.25-04	2.53-04	1.96-04	1.46-04
15	6.94-02	2.18-02	9.56-03	5.05-03	2.99-03	1.92-03	1.30-03	9.24-04	6.77-04	5.08-04	3.88-04	2.97-04	2.18-04	
14	8.13-02	2.57-02	1.14-02	6.07-03	3.62-03	2.33-03	1.59-03	1.13-03	8.26-04	6.17-04	4.65-04	3.36-04		
13	9.62-02	3.08-02	1.38-02	7.42-03	4.46-03	2.89-03	1.98-03	1.40-03	1.02-03	7.56-04	5.37-04			
12	1.16-01	3.74-02	1.71-02	9.28-03	5.63-03	3.67-03	2.51-03	1.78-03	1.28-03	8.93-04				
11	1.42-01	4.66-02	2.16-02	1.19-02	7.31-03	4.78-03	3.27-03	2.29-03	1.56-03					
10	1.79-01	5.99-02	2.84-02	1.59-02	9.78-03	6.41-03	4.33-03	2.85-03						
9	2.36-01	8.01-02	3.87-02	2.19-02	1.35-02	8.76-03	5.57-03							
8	3.27-01	1.13-01	5.53-02	3.15-02	1.93-02	1.18-02								
7	4.83-01	1.69-01	8.37-02	4.74-02	2.74-02									
6	7.76-01	2.74-01	1.36-01	7.30-02										
5	1.40+00	4.91-01	2.33-01											
4	2.98+00	1.00+00												
3	8.48+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.58-06	6.32-06	5.33-06	4.53-06	3.89-06	3.36-06	2.92-06	2.56-06	2.25-06	1.99-06	1.77-06	1.58-06	1.42-06	1.27-06
45	1.03-05	8.59-06	7.24-06	6.16-06	5.28-06	4.56-06	3.97-06	3.47-06	3.05-06	2.70-06	2.40-06	2.14-06	1.92-06	1.73-06
40	1.44-05	1.20-05	1.01-05	8.62-06	7.39-06	6.38-06	5.54-06	4.85-06	4.26-06	3.77-06	3.35-06	2.98-06	2.67-06	2.40-06
35	2.07-05	1.73-05	1.46-05	1.24-05	1.06-05	9.15-06	7.95-06	6.94-06	6.10-06	5.38-06	4.77-06	4.24-06	3.78-06	3.38-06
30	3.06-05	2.55-05	2.14-05	1.82-05	1.56-05	1.34-05	1.16-05	1.01-05	8.85-06	7.76-06	6.81-06	5.96-06	5.15-06	4.20-06
29	3.31-05	2.75-05	2.32-05	1.97-05	1.68-05	1.45-05	1.25-05	1.09-05	9.51-06	8.31-06	7.24-06	6.23-06	5.07-06	
28	3.58-05	2.98-05	2.51-05	2.13-05	1.82-05	1.56-05	1.35-05	1.17-05	1.02-05	8.84-06	7.58-06	6.14-06		
27	3.88-05	3.23-05	2.72-05	2.30-05	1.97-05	1.69-05	1.46-05	1.26-05	1.09-05	9.26-06	7.47-06			
26	4.22-05	3.51-05	2.95-05	2.50-05	2.13-05	1.82-05	1.57-05	1.34-05	1.14-05	9.15-06				
25	4.59-05	3.81-05	3.20-05	2.71-05	2.30-05	1.96-05	1.68-05	1.41-05	1.13-05					
24	5.00-05	4.16-05	3.48-05	2.94-05	2.49-05	2.11-05	1.77-05	1.41-05						
23	5.48-05	4.55-05	3.80-05	3.20-05	2.69-05	2.24-05	1.77-05							
22	6.04-05	5.00-05	4.17-05	3.48-05	2.88-05	2.26-05								
21	6.70-05	5.53-05	4.57-05	3.75-05	2.92-05									
20	7.49-05	6.13-05	4.99-05	3.86-05										
19	8.41-05	6.78-05	5.19-05											
18	9.41-05	7.15-05												
17	1.61-04													

HE + TE = 3.00+04 NE = 1.00+08 CASE B NC = 37

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	2.22-39	-1.20-38	-4.91-38	-1.30-37	-2.85-37	-5.59-37	-1.01-36	-1.74-36	-2.87-36	-4.56-36	-7.04-36	-1.06-35	-1.55-35
45	0.00+00	3.13-39	-1.63-38	-6.69-38	-1.78-37	-3.92-37	-7.72-37	-1.41-36	-2.44-36	-4.04-36	-6.49-36	-1.01-35	-1.54-35	-2.29-35
40	0.00+00	4.71-39	-2.23-38	-9.31-38	-2.49-37	-5.53-37	-1.10-36	-2.02-36	-3.52-36	-5.91-36	-9.62-36	-1.52-35	-2.36-35	-3.57-35
35	0.00+00	7.93-39	-2.99-38	-1.30-37	-3.51-37	-7.85-37	-1.57-36	-2.92-36	-5.18-36	-8.85-36	-1.47-35	-2.38-35	-3.78-35	-5.91-35
30	0.00+00	1.53-38	-3.67-38	-1.74-37	-4.82-37	-1.09-36	-2.21-36	-4.18-36	-7.56-36	-1.33-35	-2.27-35	-3.83-35	-6.37-35	-1.05-34
29	0.00+00	1.79-38	-3.71-38	-1.82-37	-5.07-37	-1.15-36	-2.34-36	-4.45-36	-8.08-36	-1.43-35	-2.47-35	-4.20-35	-7.07-35	-1.18-34
28	0.00+00	2.09-38	-3.68-38	-1.89-37	-5.31-37	-1.21-36	-2.46-36	-4.70-36	-8.58-36	-1.53-35	-2.67-35	-4.60-35	-7.86-35	-1.33-34
27	0.00+00	2.47-38	-3.56-38	-1.94-37	-5.51-37	-1.26-36	-2.57-36	-4.92-36	-9.05-36	-1.62-35	-2.87-35	-5.02-35	-8.71-35	-1.51-34
26	0.00+00	2.93-38	-3.34-38	-1.98-37	-5.67-37	-1.30-36	-2.66-36	-5.11-36	-9.45-36	-1.71-35	-3.06-35	-5.44-35	-9.63-35	-1.70-34
25	0.00+00	3.48-38	-2.97-38	-1.99-37	-5.78-37	-1.33-36	-2.73-36	-5.25-36	-9.76-36	-1.79-35	-3.24-35	-5.87-35	-1.06-34	-1.93-34
24	0.00+00	4.16-38	-2.45-38	-1.97-37	-5.82-37	-1.34-36	-2.76-36	-5.32-36	-9.95-36	-1.84-35	-3.40-35	-6.28-35	-1.17-34	-2.20-34
23	0.00+00	4.99-38	-1.74-38	-1.93-37	-5.80-37	-1.34-36	-2.76-36	-5.32-36	-1.00-35	-1.87-35	-3.52-35	-6.68-35	-1.29-34	-2.52-34
22	0.00+00	5.99-38	-8.39-39	-1.84-37	-5.73-37	-1.33-36	-2.72-36	-5.24-36	-9.89-36	-1.87-35	-3.59-35	-7.05-35	-1.42-34	-2.93-34
21	0.00+00	7.21-38	2.97-39	-1.73-37	-5.61-37	-1.31-36	-2.65-36	-5.08-36	-9.58-36	-1.83-35	-3.62-35	-7.38-35	-1.57-34	-3.17-34
20	0.00+00	8.71-38	1.73-38	-1.59-37	-5.43-37	-1.27-36	-2.55-36	-4.82-36	-9.02-36	-1.74-35	-3.54-35	-7.62-35	-1.74-34	-4.[illegible]-34
19	0.00+00	1.06-37	3.56-38	-1.39-37	-5.17-37	-1.21-36	-2.39-36	-4.39-36	-8.03-36	-1.55-35	-3.26-35	-7.56-35	-1.92-34	-5.44-34
18	0.00+00	1.29-37	6.01-38	-1.11-37	-4.74-37	-1.11-36	-2.11-36	-3.64-36	-6.20-36	-1.15-35	-2.50-35	-6.53-35	-2.00-34	-7.27-34
17	0.00+00	1.60-37	9.41-38	-6.62-38	-3.99-37	-9.33-37	-1.62-36	-2.28-36	-2.65-36	-2.79-36	-4.89-36	-2.27-35	-1.33-34	-9.14-34
16	0.00+00	2.01-37	1.43-37	5.99-39	-2.63-37	-6.06-37	-7.13-37	2.72-37	4.48-36	1.69-35	5.06-35	1.43-34	4.40-34	1.84-33
15	0.00+00	2.55-37	2.14-37	1.28-37	-2.29-38	-1.17-38	9.55-37	5.20-36	1.95-35	6.52-35	2.24-34	9.42-34	7.84-33	
14	0.00+00	3.30-37	3.21-37	3.19-37	3.98-37	1.06-36	4.07-36	1.51-35	5.37-35	2.01-34	9.40-34	8.79-33		
13	0.00+00	4.36-37	4.82-37	6.38-37	1.13-36	3.01-36	1.01-35	3.62-35	1.43-34	7.08-34	7.04-33			
12	0.00+00	5.87-37	7.29-37	1.16-36	2.41-36	6.61-36	2.22-35	8.72-35	4.44-34	4.49-33				
11	0.00+00	8.07-37	1.11-36	2.04-36	4.70-36	1.37-35	4.99-35	2.45-34	2.40-33					
10	0.00+00	1.14-36	1.72-36	3.56-36	9.11-36	2.93-35	1.30-34	1.11-33						
9	0.00+00	1.67-36	2.77-36	6.48-36	1.90-35	7.44-35	5.17-34							
8	0.00+00	2.59-36	4.78-36	1.33-35	4.96-35	3.04-34								
7	0.00+00	4.40-36	9.50-36	3.55-35	2.40-34									
6	0.00+00	8.70-36	2.50-35	1.93-34										
5	0.00+00	2.27-35	1.35-34											
4	0.00+00	1.14-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-2.23-35	-3.14-35	-4.33-35	-5.88-35	-7.85-35	-1.03-34	-1.32-34	-1.67-34	-2.08-34	-2.55-34	-3.09-34	-3.70-34	-4.42-34	-5.25-34
45	-3.34-35	-4.77-35	-6.70-35	-9.26-35	-1.26-34	-1.69-34	-2.22-34	-2.88-34	-3.69-34	-4.66-34	-5.84-34	-7.28-34	-9.04-34	-1.12-33
40	-5.31-35	-7.77-35	-1.12-34	-1.59-34	-2.24-34	-3.10-34	-4.23-34	-5.72-34	-7.65-34	-1.02-33	-1.35-33	-1.79-33	-2.39-33	-3.22-33
35	-9.08-35	-1.38-34	-2.07-34	-3.08-34	-4.55-34	-6.68-34	-9.74-34	-1.42-33	-2.06-33	-3.01-33	-4.47-33	-6.78-33	-1.06-32	-1.76-32
30	-1.70-34	-2.76-34	-4.47-34	-7.26-34	-1.18-33	-1.99-33	-3.27-33	-5.62-33	-1.01-32	-1.92-32	-4.04-32	-1.01-31	-3.49-31	-2.66-30
29	-1.95-34	-3.23-34	-5.35-34	-8.92-34	-1.51-33	-2.58-33	-4.54-33	-8.31-33	-1.62-32	-3.48-32	-8.85-32	-3.10-31	-2.39-30	
28	-2.25-34	-3.80-34	-6.48-34	-1.12-33	-1.96-33	-3.53-33	-6.62-33	-1.32-32	-2.90-32	-7.53-32	-2.69-31	-2.10-30		
27	-2.60-34	-4.52-34	-7.96-34	-1.43-33	-2.63-33	-5.06-33	-1.03-32	-2.33-32	-6.19-32	-2.25-31	-1.80-30			
26	-3.03-34	-5.44-34	-9.97-34	-1.88-33	-3.70-33	-7.76-33	-1.79-32	-4.88-32	-1.82-31	-1.48-30				
25	-3.55-34	-6.64-34	-1.28-33	-2.58-33	-5.53-33	-1.31-32	-3.67-32	-1.41-31	-1.17-30					
24	-4.21-34	-8.29-34	-1.71-33	-3.75-33	-9.11-33	-2.62-32	-1.03-31	-8.86-31						
23	-5.08-34	-1.07-33	-2.40-33	-5.98-33	-1.76-32	-7.15-32	-6.32-31							
22	-6.31-34	-1.45-33	-3.69-33	-1.12-32	-4.65-32	-4.23-31								
21	-8.20-34	-2.14-33	-6.63-33	-2.83-32	-2.65-31									
20	-1.15-33	-3.66-33	-1.61-32	-1.55-31										
19	-1.81-33	-8.28-33	-8.26-32											
18	-3.59-33	-3.82-32												
17	-1.21-32													

HE + TE = 3.00+04 NE = 1.00+09 CASE B NC = 24

TOTAL RC = 6.809-13 4-3 RC = 9.939-14 4-3 EM = 4.212-25 2S RC = 2.176-13 2P RC = 4.633-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.66-03	1.12-03	4.83-04	2.50-04	1.46-04	9.24-05	6.22-05	4.38-05	3.20-05	2.41-05	1.86-05	1.47-05	1.18-05	9.57-06
45	5.02-03	1.54-03	6.62-04	3.43-04	2.00-04	1.27-04	8.53-05	6.01-05	4.39-05	3.31-05	2.55-05	2.01-05	1.61-05	1.31-05
40	7.14-03	2.19-03	9.42-04	4.88-04	2.84-04	1.80-04	1.21-04	8.54-05	6.24-05	4.70-05	3.62-05	2.85-05	2.29-05	1.86-05
35	1.06-02	3.25-03	1.40-03	7.24-04	4.22-04	2.67-04	1.80-04	1.27-04	9.26-05	6.97-05	5.38-05	4.23-05	3.39-05	2.76-05
30	1.66-02	5.09-03	2.19-03	1.13-03	6.60-04	4.18-04	2.81-04	1.98-04	1.45-04	1.09-04	8.39-05	6.60-05	5.29-05	4.30-05
29	1.83-02	5.61-03	2.41-03	1.25-03	7.27-04	4.60-04	3.09-04	2.18-04	1.59-04	1.20-04	9.23-05	7.26-05	5.81-05	4.72-05
28	2.02-02	6.19-03	2.66-03	1.38-03	8.02-04	5.07-04	3.41-04	2.40-04	1.75-04	1.32-04	1.02-04	8.00-05	6.41-05	5.20-05
27	2.23-02	6.84-03	2.94-03	1.52-03	8.86-04	5.61-04	3.77-04	2.66-04	1.94-04	1.46-04	1.12-04	8.84-05	7.07-05	5.74-05
26	2.47-02	7.58-03	3.25-03	1.68-03	9.82-04	6.21-04	4.18-04	2.94-04	2.15-04	1.61-04	1.24-04	9.78-05	7.82-05	6.35-05
25	2.74-02	8.41-03	3.61-03	1.87-03	1.09-03	6.89-04	4.63-04	3.26-04	2.38-04	1.79-04	1.38-04	1.08-04	8.66-05	7.03-05
24	3.03-02	9.30-03	3.99-03	2.07-03	1.21-03	7.63-04	5.13-04	3.61-04	2.63-04	1.98-04	1.53-04	1.20-04	9.58-05	7.77-05
23	3.37-02	1.03-02	4.44-03	2.30-03	1.34-03	8.48-04	5.70-04	4.01-04	2.93-04	2.20-04	1.69-04	1.33-04	1.06-04	8.62-05
22	3.75-02	1.15-02	4.94-03	2.56-03	1.49-03	9.42-04	6.33-04	4.46-04	3.25-04	2.44-04	1.88-04	1.48-04	1.18-04	9.55-05
21	4.17-02	1.28-02	5.49-03	2.84-03	1.66-03	1.05-03	7.05-04	4.96-04	3.62-04	2.72-04	2.09-04	1.64-04	1.31-04	1.06-04
20	4.64-02	1.42-02	6.12-03	3.17-03	1.85-03	1.17-03	7.84-04	5.52-04	4.02-04	3.02-04	2.32-04	1.82-04	1.45-04	1.17-04
19	5.17-02	1.59-02	6.82-03	3.53-03	2.06-03	1.30-03	8.74-04	6.15-04	4.48-04	3.36-04	2.58-04	2.02-04	1.61-04	1.29-04
18	5.78-02	1.77-02	7.63-03	3.95-03	2.30-03	1.46-03	9.78-04	6.87-04	5.01-04	3.75-04	2.88-04	2.25-04	1.78-04	1.42-04
17	6.51-02	2.00-02	8.58-03	4.45-03	2.59-03	1.64-03	1.10-03	7.73-04	5.63-04	4.22-04	3.23-04	2.51-04	1.98-04	1.55-04
16	7.39-02	2.27-02	9.77-03	5.06-03	2.95-03	1.87-03	1.25-03	8.80-04	6.40-04	4.78-04	3.65-04	2.82-04	2.18-04	1.61-04
15	8.52-02	2.62-02	1.13-02	5.84-03	3.41-03	2.16-03	1.45-03	1.02-03	7.37-04	5.49-04	4.16-04	3.17-04	2.31-04	
14	9.98-02	3.07-02	1.32-02	6.87-03	4.01-03	2.54-03	1.70-03	1.19-03	8.65-04	6.40-04	4.77-04	3.42-04		
13	1.19-01	3.67-02	1.59-02	8.25-03	4.82-03	3.05-03	2.05-03	1.43-03	1.03-03	7.51-04	5.28-04			
12	1.44-01	4.46-02	1.94-02	1.01-02	5.92-03	3.75-03	2.52-03	1.75-03	1.24-03	8.55-04				
11	1.77-01	5.53-02	2.42-02	1.27-02	7.46-03	4.74-03	3.17-03	2.18-03	1.46-03					
10	2.23-01	7.01-02	3.10-02	1.64-02	9.69-03	6.15-03	4.07-03	2.65-03						
9	2.87-01	9.15-02	4.10-02	2.20-02	1.31-02	8.24-03	5.18-03							
8	3.86-01	1.25-01	5.70-02	3.09-02	1.83-02	1.10-02								
7	5.49-01	1.80-01	8.43-02	4.59-02	2.60-02									
6	8.51-01	2.84-01	1.35-01	7.01-02										
5	1.49+00	5.01-01	2.28-01											
4	3.13+00	1.00+00												
3	8.78+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.89-06	6.58-06	5.55-06	4.72-06	4.05-06	3.50-06	3.04-06	2.66-06	2.34-06	2.07-06	1.84-06	1.64-06	1.47-06	1.33-06
45	1.08-05	9.02-06	7.60-06	6.46-06	5.54-06	4.79-06	4.16-06	3.64-06	3.21-06	2.83-06	2.52-06	2.25-06	2.01-06	1.81-06
40	1.53-05	1.28-05	1.08-05	9.17-06	7.86-06	6.79-06	5.90-06	5.16-06	4.54-06	4.01-06	3.56-06	3.17-06	2.84-06	2.55-06
35	2.27-05	1.89-05	1.60-05	1.36-05	1.16-05	1.00-05	8.71-06	7.61-06	6.68-06	5.89-06	5.22-06	4.64-06	4.14-06	3.70-06
30	3.54-05	2.95-05	2.48-05	2.10-05	1.80-05	1.55-05	1.34-05	1.17-05	1.02-05	8.96-06	7.86-06	6.88-06	5.94-06	4.84-06
29	3.89-05	3.24-05	2.72-05	2.31-05	1.97-05	1.70-05	1.47-05	1.28-05	1.12-05	9.74-06	8.48-06	7.29-06	5.92-06	
28	4.28-05	3.57-05	3.00-05	2.54-05	2.17-05	1.87-05	1.61-05	1.40-05	1.21-05	1.05-05	9.01-06	7.29-06		
27	4.73-05	3.93-05	3.30-05	2.80-05	2.39-05	2.05-05	1.77-05	1.53-05	1.32-05	1.12-05	9.03-06			
26	5.22-05	4.34-05	3.64-05	3.08-05	2.63-05	2.25-05	1.93-05	1.66-05	1.40-05	1.13-05				
25	5.78-05	4.80-05	4.02-05	3.40-05	2.89-05	2.46-05	2.10-05	1.77-05	1.41-05					
24	6.39-05	5.30-05	4.44-05	3.74-05	3.17-05	2.68-05	2.25-05	1.78-05						
23	7.07-05	5.86-05	4.89-05	4.11-05	3.45-05	2.88-05	2.27-05							
22	7.82-05	6.47-05	5.38-05	4.49-05	3.71-05	2.90-05								
21	8.64-05	7.12-05	5.88-05	4.82-05	3.75-05									
20	9.53-05	7.79-05	6.33-05	4.88-05										
19	1.04-04	8.40-05	6.42-05											
18	1.13-04	8.56-05												
17	1.16-04													

HE + TE = 3.00+04 NE = 1.00+09 CASE B NC = 24

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	0.00+00	2.28-39	-1.26-38	-5.23-38	-1.40-37	-3.11-37	-6.13-37	-1.11-36	-1.91-36	-3.10-36	-4.82-36	-7.21-36	-1.04-35	-1.44-35
45	0.00+00	3.13-39	-1.74-38	-7.24-38	-1.95-37	-4.35-37	-8.62-37	-1.58-36	-2.72-36	-4.45-36	-6.99-36	-1.06-35	-1.54-35	-2.17-35
40	0.00+00	4.49-39	-2.50-38	-1.04-37	-2.82-37	-6.33-37	-1.27-36	-2.34-36	-4.07-36	-6.75-36	-1.08-35	-1.65-35	-2.45-35	-3.52-35
35	0.00+00	6.84-39	-3.73-38	-1.57-37	-4.29-37	-9.72-37	-1.97-36	-3.68-36	-6.51-36	-1.10-35	-1.79-35	-2.82-35	-4.30-35	-6.35-35
30	0.00+00	1.15-38	-5.79-38	-2.48-37	-6.89-37	-1.58-36	-3.20-36	-6.25-36	-1.13-35	-1.98-35	-3.33-35	-5.44-35	-8.67-35	-1.35-34
29	0.00+00	1.30-38	-6.33-38	-2.74-37	-7.62-37	-1.76-36	-3.64-36	-7.02-36	-1.28-35	-2.25-35	-3.83-35	-6.33-35	-1.02-34	-1.61-34
28	0.00+00	1.48-38	-6.93-38	-3.02-37	-8.44-37	-1.96-36	-4.08-36	-7.91-36	-1.46-35	-2.58-35	-4.44-35	-7.43-35	-1.22-34	-1.95-34
27	0.00+00	1.70-38	-7.57-38	-3.33-37	-9.37-37	-2.19-36	-4.58-36	-8.94-36	-1.66-35	-2.98-35	-5.17-35	-8.79-35	-1.46-34	-2.39-34
26	0.00+00	1.97-38	-8.26-38	-3.68-37	-1.04-36	-2.44-36	-5.15-36	-1.01-35	-1.90-35	-3.45-35	-6.08-35	-1.05-34	-1.78-34	-2.98-34
25	0.00+00	2.31-38	-8.96-38	-4.06-37	-1.16-36	-2.73-36	-5.80-36	-1.15-35	-2.19-35	-4.02-35	-7.20-35	-1.27-34	-2.20-34	-3.78-34
24	0.00+00	2.78-38	-9.50-38	-4.41-37	-1.27-36	-3.02-36	-6.48-36	-1.30-35	-2.50-35	-4.67-35	-8.52-35	-1.53-34	-2.73-34	-4.85-34
23	0.00+00	3.35-38	-1.01-37	-4.82-37	-1.40-36	-3.36-36	-7.28-36	-1.48-35	-2.89-35	-5.49-35	-1.02-34	-1.89-34	-3.49-34	-6.44-34
22	0.00+00	4.10-38	-1.05-37	-5.22-37	-1.53-36	-3.72-36	-8.16-36	-1.68-35	-3.34-35	-6.49-35	-1.24-34	-2.37-34	-4.55-34	-8.83-34
21	0.00+00	5.08-38	-1.07-37	-5.60-37	-1.67-36	-4.10-36	-9.10-36	-1.91-35	-3.87-35	-7.70-35	-1.52-34	-3.03-34	-6.10-34	-1.26-33
20	0.00+00	6.38-38	-1.04-37	-5.92-37	-1.80-36	-4.48-36	-1.01-35	-2.15-35	-4.47-35	-9.19-35	-1.89-34	-3.94-34	-8.49-34	-1.92-33
19	0.00+00	8.10-38	-9.61-38	-6.14-37	-1.91-36	-4.83-36	-1.11-35	-2.42-35	-5.17-35	-1.10-34	-2.38-34	-5.30-34	-1.24-33	-3.19-33
18	0.00+00	1.04-37	-8.00-38	-6.22-37	-2.00-36	-5.15-36	-1.20-35	-2.69-35	-5.97-35	-1.34-34	-3.07-34	-7.46-34	-1.99-33	-6.18-33
17	0.00+00	1.34-37	-5.41-38	-6.14-37	-2.06-36	-5.42-36	-1.29-35	-2.99-35	-6.93-35	-1.65-34	-4.13-34	-1.13-33	-3.66-33	-1.61-32
16	0.00+00	1.73-37	-1.65-38	-5.90-37	-2.09-36	-5.66-36	-1.39-35	-3.33-35	-8.18-35	-2.11-34	-5.97-34	-1.99-33	-9.04-33	-8.94-32
15	0.00+00	2.25-37	3.58-38	-5.48-37	-2.11-36	-5.89-36	-1.49-35	-3.77-35	-9.97-35	-2.90-34	-9.91-34	-4.64-33	-4.74-32	
14	0.00+00	2.96-37	1.09-37	-4.83-37	-2.11-36	-6.14-36	-1.62-35	-4.35-35	-1.29-34	-4.51-34	-2.17-33	-2.28-32		
13	0.00+00	3.94-37	2.18-37	-3.68-37	-2.08-36	-6.27-36	-1.74-35	-5.10-35	-1.80-34	-8.84-34	-9.59-33			
12	0.00+00	5.36-37	3.91-37	-1.43-37	-1.75-36	-5.86-36	-1.73-35	-5.60-35	-2.69-34	-3.01-33				
11	0.00+00	7.51-37	6.63-37	3.29-37	-8.36-37	-3.43-36	-8.15-36	-1.84-35	-1.30-34					
10	0.00+00	1.09-36	1.21-36	1.37-36	1.81-36	6.49-36	5.06-35	7.23-34						
9	0.00+00	1.66-36	2.21-36	3.78-36	9.88-36	5.18-35	6.77-34							
8	0.00+00	2.66-36	4.25-36	1.00-35	4.04-35	4.27-34								
7	0.00+00	4.61-36	9.07-36	3.11-35	2.57-34									
6	0.00+00	9.10-36	2.43-35	1.73-34										
5	0.00+00	2.34-35	1.25-34											
4	0.00+00	1.15-34												
3	0.00+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.93-35	-2.48-35	-3.08-35	-3.69-35	-4.31-35	-4.93-35	-5.54-35	-6.14-35	-6.75-35	-7.23-35	-7.85-35	-8.49-35	-9.18-35	-9.90-35
45	-2.95-35	-3.85-35	-4.86-35	-5.94-35	-7.09-35	-8.29-35	-9.55-35	-1.09-34	-1.24-34	-1.37-34	-1.55-34	-1.75-34	-1.98-34	-2.25-34
40	-4.88-35	-6.52-35	-8.45-35	-1.06-34	-1.31-34	-1.59-34	-1.90-34	-2.27-34	-2.70-34	-3.16-34	-3.79-34	-4.58-34	-5.62-34	-7.00-34
35	-9.09-35	-1.26-34	-1.70-34	-2.24-34	-2.91-34	-3.74-34	-4.79-34	-6.15-34	-7.99-34	-1.04-33	-1.40-33	-1.95-33	-2.83-33	-4.36-33
30	-2.04-34	-3.03-34	-4.40-34	-6.32-34	-9.05-34	-1.31-33	-1.92-33	-2.92-33	-4.67-33	-7.91-33	-1.53-32	-3.53-32	-1.14-31	-8.18-31
29	-2.49-34	-3.75-34	-5.58-34	-8.22-34	-1.21-33	-1.82-33	-2.81-33	-4.55-33	-7.93-33	-1.52-32	-3.54-32	-1.15-31	-8.30-31	
28	-3.06-34	-4.73-34	-7.22-34	-1.10-33	-1.69-33	-2.66-33	-4.37-33	-7.70-33	-1.51-32	-3.50-32	-1.14-31	-8.31-31		
27	-3.84-34	-6.10-34	-9.60-34	-1.52-33	-2.45-33	-4.11-33	-7.36-33	-1.46-32	-3.47-32	-1.13-31	-8.25-31			
26	-4.92-34	-8.05-34	-1.32-33	-2.19-33	-3.77-33	-6.88-33	-1.39-32	-3.33-32	-1.11-31	-8.09-31				
25	-6.44-34	-1.10-33	-1.89-33	-3.34-33	-6.25-33	-1.29-32	-3.14-32	-1.06-31	-7.74-31					
24	-8.61-34	-1.54-33	-2.82-33	-5.44-33	-1.15-32	-2.85-32	-9.74-32	-7.29-31						
23	-1.20-33	-2.29-33	-4.58-33	-9.97-33	-2.54-32	-8.87-32	-6.76-31							
22	-1.76-33	-3.66-33	-8.26-33	-2.17-32	-7.78-32	-6.07-31								
21	-2.75-33	-6.46-33	-1.77-32	-6.54-32	-5.23-31									
20	-4.72-33	-1.35-32	-5.18-32	-4.30-31										
19	-9.53-33	-3.83-32	-3.31-31											
18	-2.60-32	-2.35-31												
17	-1.53-31													

HE + TE = 3.00+04 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 7.055-13 4-3 RC = 9.655-14 4-3 EM = 4.092-25 2S RC = 2.281-13 2P RC = 4.774-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.78-03	1.16-03	4.98-04	2.58-04	1.50-04	9.53-05	6.41-05	4.52-05	3.30-05	2.49-05	1.92-05	1.51-05	1.21-05	9.87-06
45	5.19-03	1.59-03	6.84-04	3.54-04	2.07-04	1.31-04	8.81-05	6.21-05	4.54-05	3.42-05	2.64-05	2.08-05	1.66-05	1.35-05
40	7.40-03	2.27-03	9.76-04	5.05-04	2.95-04	1.87-04	1.26-04	8.85-05	6.47-05	4.87-05	3.76-05	2.96-05	2.37-05	1.93-05
35	1.11-02	3.40-03	1.46-03	7.56-04	4.41-04	2.79-04	1.88-04	1.32-04	9.66-05	7.27-05	5.61-05	4.42-05	3.54-05	2.88-05
30	1.76-02	5.40-03	2.32-03	1.20-03	7.00-04	4.43-04	2.98-04	2.10-04	1.53-04	1.15-04	8.90-05	7.00-05	5.61-05	4.56-05
29	1.95-02	5.98-03	2.57-03	1.33-03	7.75-04	4.91-04	3.30-04	2.32-04	1.70-04	1.28-04	9.84-05	7.74-05	6.20-05	5.04-05
28	2.17-02	6.64-03	2.85-03	1.48-03	8.61-04	5.45-04	3.66-04	2.58-04	1.88-04	1.42-04	1.09-04	8.59-05	6.88-05	5.59-05
27	2.41-02	7.40-03	3.18-03	1.65-03	9.59-04	6.07-04	4.08-04	2.87-04	2.10-04	1.58-04	1.22-04	9.57-05	7.66-05	6.22-05
26	2.70-02	8.28-03	3.56-03	1.84-03	1.07-03	6.79-04	4.57-04	3.21-04	2.35-04	1.76-04	1.36-04	1.07-04	8.55-05	6.94-05
25	3.03-02	9.30-03	3.99-03	2.07-03	1.21-03	7.62-04	5.12-04	3.61-04	2.63-04	1.98-04	1.52-04	1.20-04	9.59-05	7.78-05
24	3.42-02	1.05-02	4.50-03	2.33-03	1.36-03	8.59-04	5.78-04	4.06-04	2.97-04	2.23-04	1.72-04	1.35-04	1.08-04	8.75-05
23	3.87-02	1.19-02	5.10-03	2.64-03	1.54-03	9.73-04	6.53-04	4.60-04	3.35-04	2.52-04	1.94-04	1.52-04	1.22-04	9.87-05
22	4.40-02	1.35-02	5.80-03	3.00-03	1.75-03	1.11-03	7.42-04	5.22-04	3.81-04	2.86-04	2.20-04	1.73-04	1.38-04	1.12-04
21	5.03-02	1.54-02	6.62-03	3.42-03	1.99-03	1.26-03	8.47-04	5.95-04	4.34-04	3.26-04	2.51-04	1.97-04	1.57-04	1.27-04
20	5.75-02	1.76-02	7.56-03	3.91-03	2.28-03	1.44-03	9.67-04	6.80-04	4.96-04	3.72-04	2.86-04	2.24-04	1.78-04	1.44-04
19	6.61-02	2.02-02	8.69-03	4.49-03	2.62-03	1.65-03	1.11-03	7.80-04	5.68-04	4.26-04	3.27-04	2.56-04	2.03-04	1.63-04
18	7.61-02	2.33-02	1.00-02	5.17-03	3.01-03	1.90-03	1.28-03	8.97-04	6.53-04	4.89-04	3.75-04	2.92-04	2.31-04	1.84-04
17	8.78-02	2.69-02	1.15-02	5.96-03	3.47-03	2.19-03	1.47-03	1.03-03	7.50-04	5.61-04	4.29-04	3.34-04	2.62-04	2.05-04
16	1.01-01	3.10-02	1.33-02	6.88-03	4.00-03	2.53-03	1.69-03	1.19-03	8.61-04	6.43-04	4.90-04	3.78-04	2.92-04	2.15-04
15	1.17-01	3.57-02	1.53-02	7.92-03	4.60-03	2.91-03	1.95-03	1.36-03	9.87-04	7.33-04	5.55-04	4.21-04	3.06-04	
14	1.34-01	4.12-02	1.77-02	9.12-03	5.30-03	3.34-03	2.23-03	1.56-03	1.13-03	8.31-04	6.18-04	4.42-04		
13	1.55-01	4.76-02	2.04-02	1.05-02	6.12-03	3.85-03	2.57-03	1.79-03	1.28-03	9.32-04	6.52-04			
12	1.82-01	5.58-02	2.39-02	1.23-02	7.16-03	4.50-03	3.00-03	2.07-03	1.46-03	9.98-04				
11	2.19-01	6.70-02	2.87-02	1.48-02	8.60-03	5.39-03	3.56-03	2.42-03	1.61-03					
10	2.71-01	8.33-02	3.57-02	1.84-02	1.07-02	6.66-03	4.33-03	2.78-03						
9	3.49-01	1.07-01	4.62-02	2.39-02	1.38-02	8.47-03	5.21-03							
8	4.67-01	1.44-01	6.24-02	3.22-02	1.84-02	1.07-02								
7	6.55-01	2.06-01	8.87-02	4.57-02	2.49-02									
6	9.89-01	3.09-01	1.35-01	6.73-02										
5	1.67+00	5.20-01	2.22-01											
4	3.38+00	1.00+00												
3	9.18+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.14-06	6.79-06	5.72-06	4.87-06	4.18-06	3.61-06	3.14-06	2.75-06	2.42-06	2.14-06	1.90-06	1.70-06	1.52-06	1.37-06
45	1.12-05	9.37-06	7.85-06	6.68-06	5.73-06	4.95-06	4.30-06	3.76-06	3.31-06	2.93-06	2.60-06	2.32-06	2.08-06	1.87-06
40	1.59-05	1.33-05	1.12-05	9.50-06	8.14-06	7.03-06	6.11-06	5.35-06	4.70-06	4.15-06	3.69-06	3.29-06	2.94-06	2.64-06
35	2.37-05	1.98-05	1.66-05	1.41-05	1.21-05	1.05-05	9.08-06	7.94-06	6.97-06	6.15-06	5.45-06	4.85-06	4.32-06	3.87-06
30	3.75-05	3.13-05	2.63-05	2.23-05	1.91-05	1.64-05	1.42-05	1.24-05	1.08-05	9.51-06	8.34-06	7.30-06	6.30-06	5.14-06
29	4.15-05	3.45-05	2.90-05	2.46-05	2.11-05	1.81-05	1.57-05	1.36-05	1.19-05	1.04-05	9.05-06	7.78-06	6.32-06	
28	4.60-05	3.83-05	3.22-05	2.73-05	2.33-05	2.00-05	1.73-05	1.50-05	1.30-05	1.13-05	9.68-06	7.83-06		
27	5.12-05	4.26-05	3.58-05	3.03-05	2.58-05	2.22-05	1.91-05	1.65-05	1.42-05	1.21-05	9.77-06			
26	5.71-05	4.75-05	3.98-05	3.37-05	2.87-05	2.46-05	2.11-05	1.81-05	1.53-05	1.23-05				
25	6.39-05	5.31-05	4.45-05	3.76-05	3.20-05	2.73-05	2.32-05	1.96-05	1.56-05					
24	7.18-05	5.96-05	4.99-05	4.21-05	3.56-05	3.01-05	2.52-05	2.00-05						
23	8.09-05	6.71-05	5.60-05	4.70-05	3.95-05	3.29-05	2.59-05							
22	9.14-05	7.56-05	6.29-05	5.24-05	4.33-05	3.39-05								
21	1.03-04	8.52-05	7.03-05	5.76-05	4.47-05									
20	1.17-04	9.56-05	7.76-05	5.98-05										
19	1.32-04	1.06-04	8.69-05											
18	1.47-04	1.11-04												
17	1.53-04													

HE + TE = 3.00+04 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.70-32	2.11-39	-1.39-38	-5.57-38	-1.46-37	-3.16-37	-6.08-37	-1.07-36	-1.76-36	-2.67-36	-3.75-36	-4.85-36	-5.81-36	-6.52-36
45	2.34-32	2.88-39	-1.92-38	-7.74-38	-2.03-37	-4.43-37	-8.58-37	-1.52-36	-2.51-36	-3.85-36	-5.47-36	-7.15-36	-8.69-36	-9.92-36
40	3.33-32	4.07-39	-2.78-38	-1.12-37	-2.96-37	-6.49-37	-1.27-36	-2.28-36	-3.80-36	-5.90-36	-8.49-36	-1.13-35	-1.40-35	-1.63-35
35	4.99-32	6.03-39	-4.23-38	-1.71-37	-4.57-37	-1.01-36	-2.00-36	-3.64-36	-6.18-36	-9.79-36	-1.44-35	-1.97-35	-2.51-35	-3.03-35
30	7.96-32	9.54-39	-6.88-38	-2.81-37	-7.59-37	-1.71-36	-3.45-36	-6.43-36	-1.12-35	-1.83-35	-2.79-35	-3.97-35	-5.32-35	-6.79-35
29	8.82-32	1.06-38	-7.66-38	-3.14-37	-8.50-37	-1.92-36	-3.90-36	-7.32-36	-1.28-35	-2.12-35	-3.26-35	-4.69-35	-6.37-35	-8.25-35
28	9.81-32	1.18-38	-8.56-38	-3.52-37	-9.57-37	-2.17-36	-4.44-36	-8.38-36	-1.48-35	-2.47-35	-3.84-35	-5.60-35	-7.72-35	-1.02-34
27	1.10-31	1.32-38	-9.60-38	-3.96-37	-1.08-36	-2.47-36	-5.07-36	-9.66-36	-1.72-35	-2.90-35	-4.58-35	-6.78-35	-9.50-35	-1.28-34
26	1.23-31	1.48-38	-1.08-37	-4.47-37	-1.23-36	-2.82-36	-5.84-36	-1.12-35	-2.02-35	-3.45-35	-5.52-35	-8.31-35	-1.19-34	-1.64-34
25	1.39-31	1.68-38	-1.22-37	-5.08-37	-1.40-36	-3.25-36	-6.77-36	-1.31-35	-2.40-35	-4.14-35	-6.75-35	-1.04-34	-1.52-34	-2.15-34
24	1.57-31	1.92-38	-1.38-37	-5.80-37	-1.61-36	-3.76-36	-7.91-36	-1.55-35	-2.88-35	-5.05-35	-8.38-35	-1.32-34	-1.98-34	-2.91-34
23	1.79-31	2.21-38	-1.58-37	-6.64-37	-1.86-36	-4.38-36	-9.32-36	-1.85-35	-3.49-35	-6.24-35	-1.06-34	-1.71-34	-2.67-34	-4.08-34
22	2.05-31	2.59-38	-1.80-37	-7.65-37	-2.16-36	-5.14-36	-1.11-35	-2.24-35	-4.29-35	-7.86-35	-1.37-34	-2.29-34	-3.71-34	-5.97-34
21	2.36-31	3.07-38	-2.06-37	-8.85-37	-2.52-36	-6.07-36	-1.33-35	-2.74-35	-5.36-35	-1.01-34	-1.82-34	-3.16-34	-5.40-34	-9.27-34
20	2.74-31	3.74-38	-2.34-37	-1.02-36	-2.95-36	-7.20-36	-1.61-35	-3.37-35	-6.80-35	-1.32-34	-2.48-34	-4.54-34	-8.26-34	-1.55-33
19	3.21-31	4.62-38	-2.67-37	-1.19-36	-3.48-36	-8.63-36	-1.96-35	-4.24-35	-8.81-35	-1.78-34	-3.52-34	-6.88-34	-1.37-33	-2.91-33
18	3.80-31	5.87-38	-3.03-37	-1.38-36	-4.11-36	-1.04-35	-2.43-35	-5.40-35	-1.17-34	-2.49-34	-5.26-34	-1.12-33	-2.53-33	-6.51-33
17	4.53-31	7.66-38	-3.39-37	-1.60-36	-4.86-36	-1.26-35	-3.03-35	-7.00-35	-1.59-34	-3.63-34	-8.38-34	-2.03-33	-5.55-33	-2.01-32
16	5.48-31	1.03-37	-3.70-37	-1.83-36	-5.72-36	-1.53-35	-3.81-35	-9.25-35	-2.25-34	-5.60-34	-1.47-33	-4.32-33	-1.67-32	-1.36-31
15	6.70-31	1.43-37	-3.88-37	-2.07-36	-6.67-36	-1.84-35	-4.82-35	-1.25-34	-3.32-34	-9.39-34	-3.00-33	-1.25-32	-1.09-31	
14	8.33-31	2.03-37	-3.80-37	-2.28-36	-7.68-36	-2.22-35	-6.17-35	-1.74-34	-5.25-34	-1.81-33	-8.19-33	-7.71-32		
13	1.05-30	2.92-37	-3.32-37	-2.45-36	-8.71-36	-2.67-35	-8.03-35	-2.56-34	-9.37-34	-4.57-33	-4.69-32			
12	1.36-30	4.26-37	-2.27-37	-2.55-36	-9.82-36	-3.25-35	-1.10-34	-4.21-34	-2.17-33	-2.39-32				
11	1.80-30	6.27-37	-4.77-38	-2.62-36	-1.13-35	-4.17-35	-1.68-34	-8.99-34	-1.04-32					
10	2.47-30	9.39-37	2.55-37	-2.68-36	-1.37-35	-6.00-35	-3.33-34	-3.94-33						
9	3.51-30	1.46-36	8.33-37	-2.52-36	-1.77-35	-1.05-34	-1.26-33							
8	5.27-30	2.41-36	2.13-36	-1.17-36	-2.19-35	-2.61-34								
7	8.51-30	4.35-36	5.62-36	7.25-36	3.33-35									
6	1.53-29	9.01-36	1.79-35	9.47-35										
5	3.27-29	2.37-35	1.02-34											
4	9.78-29	1.16-34												
3	7.09-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-6.94-35	-7.03-36	-6.81-36	-6.26-36	-5.39-36	-3.94-36	-2.28-36	-1.28-37	2.60-36	6.06-36	1.04-35	1.59-35	2.28-35	3.15-35
45	-1.07-35	-1.11-35	-1.11-35	-1.05-35	-9.49-36	-7.53-36	-5.21-36	-2.02-36	2.25-36	7.93-36	1.55-35	2.55-35	3.89-35	5.69-35
40	-1.81-35	-1.96-35	-2.00-35	-1.99-35	-1.91-35	-1.67-35	-1.37-35	-8.97-36	-2.00-36	8.20-36	2.31-35	4.49-35	7.74-35	1.26-34
35	-3.50-35	-3.92-35	-4.27-35	-4.56-35	-4.76-35	-4.69-35	-4.56-35	-4.12-35	-3.19-35	-1.38-35	2.00-35	8.23-35	2.02-34	4.41-34
30	-8.37-35	-1.01-34	-1.21-34	-1.44-34	-1.72-34	-2.02-34	-2.45-34	-3.03-34	-3.81-34	-4.89-34	-6.32-34	-7.68-34	-2.07-34	1.37-32
29	-1.04-34	-1.28-34	-1.57-34	-1.93-34	-2.39-34	-2.95-34	-3.82-34	-5.13-34	-7.25-34	-1.11-33	-1.90-33	-4.08-33	-1.38-32	
28	-1.31-34	-1.65-34	-2.09-34	-2.66-34	-3.46-34	-4.53-34	-6.34-34	-9.43-34	-1.55-33	-2.97-33	-7.67-33	-4.22-32		
27	-1.68-34	-2.19-34	-2.87-34	-3.82-34	-5.25-34	-7.39-34	-1.14-33	-1.94-33	-3.94-33	-1.10-32	-6.62-32			
26	-2.22-34	-2.99-34	-4.09-34	-5.75-34	-8.47-34	-1.31-33	-2.31-33	-4.83-33	-1.40-32	-8.99-32				
25	-3.01-34	-4.24-34	-6.11-34	-9.19-34	-1.48-33	-2.62-33	-5.62-33	-1.67-32	-1.11-31					
24	-4.25-34	-6.30-34	-9.70-34	-1.60-33	-2.93-33	-6.29-33	-1.92-32	-1.29-31						
23	-6.26-34	-9.92-34	-1.67-33	-3.12-33	-6.95-33	-2.12-32	-1.46-31							
22	-9.80-34	-1.70-33	-3.24-33	-7.34-33	-2.31-32	-1.59-31								
21	-1.66-33	-3.26-33	-7.56-33	-2.41-32	-1.69-31									
20	-3.14-33	-7.45-33	-2.43-32	-1.73-31										
19	-7.14-33	-2.39-32	-1.75-31											
18	-2.26-32	-1.69-31												
17	-1.57-31													

HE + TE = 3.00+04 NE = 1.00+11 CASE B NC = 20

TOTAL RC = 7.521-13 4-3 RC = 9.824-14 4-3 EM = 4.163-25 2S RC = 2.361-13 2P RC = 5.161-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.71-03	1.14-03	4.90-04	2.54-04	1.48-04	9.37-05	6.31-05	4.44-05	3.25-05	2.45-05	1.89-05	1.49-05	1.19-05	9.70-06
45	5.10-03	1.57-03	6.73-04	3.48-04	2.03-04	1.29-04	8.66-05	6.10-05	4.46-05	3.36-05	2.59-05	2.04-05	1.64-05	1.33-05
40	7.28-03	2.23-03	9.60-04	4.97-04	2.90-04	1.84-04	1.24-04	8.71-05	6.36-05	4.79-05	3.70-05	2.91-05	2.33-05	1.90-05
35	1.09-02	3.35-03	1.44-03	7.45-04	4.34-04	2.75-04	1.85-04	1.30-04	9.52-05	7.17-05	5.53-05	4.35-05	3.49-05	2.84-05
30	1.74-02	5.34-03	2.29-03	1.19-03	6.93-04	4.38-04	2.95-04	2.08-04	1.52-04	1.14-04	8.80-05	6.92-05	5.54-05	4.51-05
29	1.93-02	5.92-03	2.54-03	1.32-03	7.68-04	4.86-04	3.27-04	2.30-04	1.68-04	1.26-04	9.75-05	7.67-05	6.14-05	4.99-05
28	2.15-02	6.59-03	2.83-03	1.46-03	8.54-04	5.40-04	3.63-04	2.56-04	1.87-04	1.41-04	1.08-04	8.52-05	6.82-05	5.54-05
27	2.40-02	7.36-03	3.16-03	1.64-03	9.53-04	6.03-04	4.06-04	2.86-04	2.09-04	1.57-04	1.21-04	9.51-05	7.61-05	6.18-05
26	2.69-02	8.25-03	3.54-03	1.83-03	1.07-03	6.76-04	4.55-04	3.20-04	2.34-04	1.76-04	1.35-04	1.06-04	8.52-05	6.92-05
25	3.03-02	9.29-03	3.99-03	2.07-03	1.20-03	7.62-04	5.12-04	3.60-04	2.63-04	1.98-04	1.52-04	1.20-04	9.58-05	7.77-05
24	3.43-02	1.05-02	4.52-03	2.34-03	1.36-03	8.62-04	5.79-04	4.08-04	2.98-04	2.24-04	1.72-04	1.35-04	1.08-04	8.77-05
23	3.91-02	1.20-02	5.14-03	2.66-03	1.55-03	9.81-04	6.59-04	4.64-04	3.38-04	2.54-04	1.96-04	1.54-04	1.23-04	9.95-05
22	4.47-02	1.37-02	5.88-03	3.04-03	1.77-03	1.12-03	7.54-04	5.30-04	3.87-04	2.90-04	2.23-04	1.75-04	1.40-04	1.13-04
21	5.15-02	1.58-02	6.78-03	3.50-03	2.04-03	1.29-03	8.67-04	6.10-04	4.45-04	3.34-04	2.57-04	2.01-04	1.60-04	1.30-04
20	5.97-02	1.83-02	7.85-03	4.06-03	2.36-03	1.49-03	1.00-03	7.05-04	5.14-04	3.86-04	2.96-04	2.32-04	1.85-04	1.49-04
19	6.97-02	2.13-02	9.16-03	4.74-03	2.76-03	1.74-03	1.17-03	8.22-04	5.99-04	4.49-04	3.44-04	2.69-04	2.14-04	1.72-04
18	8.19-02	2.51-02	1.08-02	5.57-03	3.24-03	2.05-03	1.37-03	9.64-04	7.02-04	5.25-04	4.03-04	3.14-04	2.48-04	1.98-04
17	9.70-02	2.97-02	1.27-02	6.59-03	3.83-03	2.42-03	1.62-03	1.14-03	8.28-04	6.19-04	4.73-04	3.68-04	2.89-04	2.26-04
16	1.16-01	3.55-02	1.52-02	7.86-03	4.57-03	2.88-03	1.93-03	1.35-03	9.83-04	7.33-04	5.58-04	4.31-04	3.32-04	2.45-04
15	1.39-01	4.26-02	1.83-02	9.44-03	5.49-03	3.46-03	2.31-03	1.62-03	1.17-03	8.71-04	6.59-04	4.99-04	3.63-04	
14	1.69-01	5.16-02	2.21-02	1.14-02	6.62-03	4.17-03	2.79-03	1.95-03	1.40-03	1.03-03	7.68-04	5.68-04		
13	2.05-01	6.26-02	2.68-02	1.38-02	8.01-03	5.04-03	3.36-03	2.34-03	1.67-03	1.21-03	8.47-04			
12	2.48-01	7.59-02	3.25-02	1.67-02	9.69-03	6.08-03	4.04-03	2.79-03	1.96-03	1.34-03				
11	3.00-01	9.15-02	3.91-02	2.01-02	1.16-02	7.27-03	4.79-03	3.25-03	2.16-03					
10	3.60-01	1.10-01	4.69-02	2.41-02	1.39-02	8.62-03	5.59-03	3.57-03						
9	4.38-01	1.34-01	5.69-02	2.91-02	1.67-02	1.02-02	6.22-03							
8	5.57-01	1.70-01	7.21-02	3.67-02	2.07-02	1.19-02								
7	7.58-01	2.31-01	9.77-02	4.90-02	2.61-02									
6	1.12+00	3.39-01	1.42-01	6.78-02										
5	1.85+00	5.51-01	2.20-01											
4	3.64+00	1.00+00												
3	9.50+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.00-06	6.68-06	5.63-06	4.79-06	4.11-06	3.55-06	3.09-06	2.70-06	2.38-06	2.10-06	1.87-06	1.67-06	1.49-06	1.34-06
45	1.10-05	9.16-06	7.72-06	6.57-06	5.63-06	4.86-06	4.23-06	3.70-06	3.26-06	2.88-06	2.56-06	2.28-06	2.04-06	1.84-06
40	1.56-05	1.30-05	1.10-05	9.35-06	8.01-06	6.92-06	6.01-06	5.26-06	4.63-06	4.09-06	3.63-06	3.24-06	2.90-06	2.60-06
35	2.34-05	1.95-05	1.64-05	1.39-05	1.19-05	1.03-05	8.95-06	7.82-06	6.87-06	6.06-06	5.37-06	4.78-06	4.26-06	3.81-06
30	3.71-05	3.09-05	2.60-05	2.21-05	1.89-05	1.63-05	1.41-05	1.23-05	1.07-05	9.40-06	8.25-06	7.22-06	6.23-06	5.08-06
29	4.11-05	3.42-05	2.88-05	2.44-05	2.09-05	1.79-05	1.55-05	1.35-05	1.18-05	1.03-05	8.96-06	7.70-06	6.26-06	
28	4.56-05	3.80-05	3.19-05	2.71-05	2.31-05	1.99-05	1.72-05	1.49-05	1.29-05	1.12-05	9.60-06	7.76-06		
27	5.08-05	4.23-05	3.55-05	3.01-05	2.57-05	2.20-05	1.90-05	1.64-05	1.42-05	1.21-05	9.74-06			
26	5.69-05	4.73-05	3.97-05	3.36-05	2.86-05	2.45-05	2.10-05	1.80-05	1.53-05	1.23-05				
25	6.39-05	5.31-05	4.45-05	3.76-05	3.20-05	2.72-05	2.32-05	1.98-05	1.56-05					
24	7.21-05	5.98-05	5.01-05	4.22-05	3.57-05	3.02-05	2.53-05	2.01-05						
23	8.16-05	6.76-05	5.65-05	4.74-05	3.98-05	3.31-05	2.61-05							
22	9.28-05	7.67-05	6.38-05	5.32-05	4.39-05	3.44-05								
21	1.06-04	8.72-05	7.20-05	5.90-05	4.58-05									
20	1.21-04	9.91-05	8.04-05	6.20-05										
19	1.39-04	1.11-04	8.51-05											
18	1.57-04	1.19-04												
17	1.69-04													

HE + TE = 3.00+04 NE = 1.00+11 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.17-32	8.56-40	-1.55-38	-5.47-38	-1.35-37	-2.79-37	-4.94-37	-7.42-37	-9.27-37	-9.58-37	-8.02-37	-4.66-37	4.18-38	7.19-37
45	1.61-32	1.15-39	-2.15-38	-7.61-38	-1.89-37	-3.91-37	-6.97-37	-1.06-36	-1.33-36	-1.40-36	-1.20-36	-7.35-37	-1.60-38	9.65-37
40	2.29-32	1.60-39	-3.10-38	-1.10-37	-2.76-37	-5.75-37	-1.03-36	-1.59-36	-2.03-36	-2.17-36	-1.92-36	-1.26-36	-1.98-37	1.31-36
35	3.43-32	2.29-39	-4.73-38	-1.69-37	-4.27-37	-9.00-37	-1.64-36	-2.56-36	-3.34-36	-3.67-36	-3.39-36	-2.45-36	-7.85-37	1.70-36
30	5.47-32	3.40-39	-7.75-38	-2.80-37	-7.16-37	-1.54-36	-2.86-36	-4.57-36	-6.18-36	-7.10-36	-7.00-36	-5.70-36	-2.98-36	1.55-36
29	6.06-32	3.70-39	-8.65-38	-3.13-37	-8.04-37	-1.73-36	-3.24-36	-5.22-36	-7.12-36	-8.29-36	-8.31-36	-6.96-36	-3.96-36	1.21-36
28	6.74-32	4.04-39	-9.70-38	-3.52-37	-9.07-37	-1.97-36	-3.70-36	-6.01-36	-8.28-36	-9.76-36	-9.97-36	-8.62-36	-5.32-36	5.95-37
27	7.53-32	4.41-39	-1.09-37	-3.98-37	-1.03-36	-2.24-36	-4.26-36	-6.97-36	-9.71-36	-1.16-35	-1.21-35	-1.08-35	-7.25-36	-4.65-37
26	8.45-32	4.82-39	-1.24-37	-4.52-37	-1.18-36	-2.58-36	-4.93-36	-8.16-36	-1.15-35	-1.40-35	-1.49-35	-1.38-35	-1.00-35	-2.27-36
25	9.52-32	5.29-39	-1.41-37	-5.16-37	-1.35-36	-2.99-36	-5.76-36	-9.64-36	-1.38-35	-1.71-35	-1.87-35	-1.80-35	-1.41-35	-5.35-36
24	1.08-31	5.81-39	-1.61-37	-5.94-37	-1.57-36	-3.49-36	-6.80-36	-1.15-35	-1.68-35	-2.12-35	-2.39-35	-2.40-35	-2.04-35	-1.07-35
23	1.23-31	6.41-39	-1.86-37	-6.88-37	-1.83-36	-4.11-36	-8.11-36	-1.39-35	-2.07-35	-2.68-35	-3.12-35	-3.29-35	-3.04-35	-2.03-35
22	1.41-31	7.10-39	-2.16-37	-8.04-37	-2.15-36	-4.90-36	-9.79-36	-1.71-35	-2.59-35	-3.46-35	-4.18-35	-4.65-35	-4.68-35	-3.82-35
21	1.62-31	7.90-39	-2.53-37	-9.47-37	-2.56-36	-5.90-36	-1.20-35	-2.14-35	-3.32-35	-4.58-35	-5.77-35	-6.83-35	-7.55-35	-7.38-35
20	1.89-31	8.92-39	-2.98-37	-1.13-36	-3.08-36	-7.20-36	-1.49-35	-2.73-35	-4.36-35	-6.24-35	-8.28-35	-1.05-34	-1.28-34	-1.49-34
19	2.21-31	1.02-38	-3.55-37	-1.35-36	-3.76-36	-8.94-36	-1.89-35	-3.56-35	-5.90-35	-8.84-35	-1.25-34	-1.72-34	-2.38-34	-3.38-34
18	2.61-31	1.19-38	-4.26-37	-1.65-36	-4.64-36	-1.13-35	-2.45-35	-4.77-35	-8.26-35	-1.31-34	-2.00-34	-3.07-34	-4.98-34	-9.08-34
17	3.12-31	1.44-38	-5.17-37	-2.03-36	-5.83-36	-1.45-35	-3.27-35	-6.62-35	-1.21-34	-2.07-34	-3.48-34	-6.17-34	-1.25-33	-3.37-33
16	3.76-31	1.83-38	-6.33-37	-2.53-36	-7.44-36	-1.91-35	-4.48-35	-9.59-35	-1.88-34	-3.53-34	-6.82-34	-1.49-33	-4.36-33	-2.74-32
15	4.60-31	2.53-38	-7.80-37	-3.19-36	-9.68-36	-2.59-35	-6.39-35	-1.46-34	-3.16-34	-6.77-34	-1.60-33	-5.02-33	-3.37-32	
14	5.72-31	3.84-38	-9.67-37	-4.08-36	-1.28-35	-3.61-35	-9.54-35	-2.40-34	-5.90-34	-1.55-33	-5.23-33	-3.74-32		
13	7.24-31	6.41-38	-1.19-36	-5.26-36	-1.74-35	-5.22-35	-1.51-34	-4.33-34	-1.31-33	-4.88-33	-3.75-32			
12	9.35-31	1.16-37	-1.45-36	-6.78-36	-2.39-35	-7.85-35	-2.59-34	-9.12-34	-3.92-33	-3.33-32				
11	1.24-30	2.22-37	-1.70-36	-8.65-36	-3.33-35	-1.24-34	-5.03-34	-2.53-33	-2.49-32					
10	1.70-30	4.32-37	-1.84-36	-1.08-35	-4.71-35	-2.14-34	-1.24-33	-1.43-32						
9	2.41-30	8.28-37	-1.77-36	-1.32-35	-7.04-35	-4.52-34	-5.94-33							
8	3.62-30	1.56-36	-1.41-36	-1.73-35	-1.30-34	-1.86-33								
7	5.85-30	3.06-36	-3.82-37	-2.76-35	-4.70-34									
6	1.05-29	6.77-36	3.95-36	-6.98-35										
5	2.25-29	1.93-35	3.90-35											
4	6.72-29	9.91-35												
3	4.87-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.58-36	2.63-36	3.92-36	5.48-36	7.37-36	9.70-36	1.25-35	1.58-35	1.99-35	2.49-35	3.11-35	3.86-35	4.79-35	5.96-35
45	2.23-36	3.83-36	5.82-36	8.30-36	1.14-35	1.52-35	2.00-35	2.60-35	3.35-35	4.30-35	5.52-35	7.08-35	9.12-35	1.16-34
40	3.31-36	5.92-36	9.29-36	1.36-35	1.92-35	2.66-35	3.61-35	4.86-35	6.52-35	8.75-35	1.18-34	1.60-34	2.20-34	3.07-34
35	5.19-36	9.97-36	1.65-35	2.54-35	3.76-35	5.49-35	7.91-35	1.14-34	1.65-34	2.42-34	3.62-34	5.58-34	8.95-34	1.52-33
30	8.54-36	1.91-35	3.49-35	5.91-35	9.68-35	1.58-34	2.60-34	4.37-34	7.71-34	1.46-33	3.08-33	7.75-33	2.71-32	2.11-31
29	9.42-36	2.22-35	4.19-35	7.32-35	1.24-34	2.10-34	3.62-34	6.47-34	1.24-33	2.64-33	6.70-33	2.36-32	1.84-31	
28	1.03-35	2.60-35	5.11-35	9.26-35	1.63-34	2.91-34	5.32-34	1.03-33	2.23-33	5.71-33	2.04-32	1.60-31		
27	1.12-35	3.07-35	6.35-35	1.20-34	2.23-34	4.24-34	8.44-34	1.85-33	4.81-33	1.72-32	1.37-31			
26	1.18-35	3.66-35	8.07-35	1.62-34	3.21-34	6.65-34	1.49-33	3.95-33	1.44-32	1.15-31				
25	1.18-35	4.39-35	1.05-34	2.29-34	4.96-34	1.16-33	3.16-33	1.17-32	9.56-32					
24	1.01-35	5.29-35	1.42-34	3.43-34	8.48-34	2.41-33	9.22-33	7.61-32						
23	4.89-36	6.32-35	2.02-34	5.66-34	1.72-33	6.90-33	5.93-32							
22	-9.30-36	7.16-35	3.04-34	1.08-33	4.72-33	4.26-32								
21	-4.63-35	6.52-35	5.05-34	2.77-33	2.85-32									
20	-1.47-34	-1.36-35	1.01-33	1.48-32										
19	-4.92-34	-6.43-34	2.21-33											
18	-2.11-33	-9.12-33												
17	-1.91-32													

HE + TE = 3.00+04 NE = 1.00+12 CASE B NC = 20

TOTAL RC = 8.430-13 4-3 RC = 1.121-13 4-3 EM = 4.749-25 2S RC = 2.199-13 2P RC = 6.232-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.25-03	9.99-04	4.29-04	2.22-04	1.30-04	8.22-05	5.53-05	3.90-05	2.85-05	2.14-05	1.66-05	1.30-05	1.05-05	8.51-06
45	4.47-03	1.37-03	5.90-04	3.05-04	1.78-04	1.13-04	7.59-05	5.35-05	3.91-05	2.95-05	2.27-05	1.79-05	1.43-05	1.17-05
40	6.39-03	1.96-03	8.42-04	4.36-04	2.54-04	1.61-04	1.08-04	7.64-05	5.58-05	4.20-05	3.24-05	2.55-05	2.05-05	1.66-05
35	9.57-03	2.94-03	1.26-03	6.53-04	3.81-04	2.41-04	1.62-04	1.14-04	8.35-05	6.29-05	4.85-05	3.82-05	3.06-05	2.49-05
30	1.53-02	4.69-03	2.01-03	1.04-03	6.08-04	3.85-04	2.59-04	1.82-04	1.33-04	1.00-04	7.72-05	6.08-05	4.87-05	3.95-05
29	1.69-02	5.20-03	2.23-03	1.16-03	6.74-04	4.27-04	2.87-04	2.02-04	1.48-04	1.11-04	8.55-05	6.73-05	5.39-05	4.38-05
28	1.89-02	5.78-03	2.48-03	1.29-03	7.50-04	4.75-04	3.19-04	2.25-04	1.64-04	1.23-04	9.51-05	7.48-05	5.99-05	4.87-05
27	2.11-02	6.46-03	2.78-03	1.44-03	8.37-04	5.30-04	3.56-04	2.51-04	1.83-04	1.38-04	1.06-04	8.35-05	6.68-05	5.43-05
26	2.36-02	7.25-03	3.11-03	1.61-03	9.40-04	5.95-04	4.00-04	2.81-04	2.05-04	1.54-04	1.19-04	9.36-05	7.49-05	6.08-05
25	2.67-02	8.17-03	3.51-03	1.82-03	1.06-03	6.70-04	4.50-04	3.17-04	2.31-04	1.74-04	1.34-04	1.05-04	8.42-05	6.84-05
24	3.02-02	9.26-03	3.98-03	2.06-03	1.20-03	7.59-04	5.10-04	3.59-04	2.62-04	1.97-04	1.52-04	1.19-04	9.52-05	7.72-05
23	3.44-02	1.06-02	4.53-03	2.34-03	1.37-03	8.64-04	5.81-04	4.09-04	2.98-04	2.24-04	1.72-04	1.35-04	1.08-04	8.77-05
22	3.95-02	1.21-02	5.19-03	2.69-03	1.57-03	9.90-04	6.65-04	4.68-04	3.41-04	2.56-04	1.97-04	1.55-04	1.24-04	1.00-04
21	4.55-02	1.40-02	5.99-03	3.10-03	1.81-03	1.14-03	7.67-04	5.39-04	3.93-04	2.95-04	2.27-04	1.78-04	1.42-04	1.15-04
20	5.29-02	1.62-02	6.96-03	3.60-03	2.10-03	1.33-03	8.90-04	6.25-04	4.56-04	3.42-04	2.63-04	2.06-04	1.64-04	1.32-04
19	6.20-02	1.90-02	8.15-03	4.22-03	2.45-03	1.55-03	1.04-03	7.31-04	5.33-04	3.99-04	3.06-04	2.40-04	1.90-04	1.53-04
18	7.33-02	2.25-02	9.63-03	4.98-03	2.90-03	1.83-03	1.23-03	8.62-04	6.28-04	4.70-04	3.60-04	2.81-04	2.22-04	1.77-04
17	8.75-02	2.68-02	1.15-02	5.94-03	3.46-03	2.18-03	1.46-03	1.03-03	7.46-04	5.58-04	4.26-04	3.31-04	2.60-04	2.04-04
16	1.06-01	3.23-02	1.39-02	7.16-03	4.16-03	2.63-03	1.76-03	1.23-03	8.95-04	6.68-04	5.08-04	3.92-04	3.03-04	2.23-04
15	1.29-01	3.95-02	1.69-02	8.74-03	5.08-03	3.20-03	2.14-03	1.50-03	1.09-03	8.06-04	6.09-04	4.62-04	3.35-04	
14	1.60-01	4.89-02	2.09-02	1.08-02	6.27-03	3.95-03	2.64-03	1.84-03	1.33-03	9.79-04	7.27-04	5.19-04		
13	2.01-01	6.13-02	2.63-02	1.35-02	7.85-03	4.94-03	3.29-03	2.29-03	1.64-03	1.19-03	8.29-04			
12	2.56-01	7.82-02	3.34-02	1.72-02	9.97-03	6.25-03	4.15-03	2.86-03	2.01-03	1.37-03				
11	3.31-01	1.01-01	4.31-02	2.22-02	1.28-02	8.00-03	5.27-03	3.57-03	2.37-03					
10	4.32-01	1.32-01	5.61-02	2.88-02	1.66-02	1.03-02	6.65-03	4.24-03						
9	5.63-01	1.72-01	7.30-02	3.73-02	2.13-02	1.30-02	7.91-03							
8	7.25-01	2.20-01	9.34-02	4.74-02	2.66-02	1.53-02								
7	9.22-01	2.79-01	1.18-01	5.86-02	3.10-02									
6	1.24+00	3.74-01	1.55-01	7.29-02										
5	1.93+00	5.70-01	2.23-01											
4	3.63+00	1.00+00												
3	9.40+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	7.02-06	5.85-06	4.93-06	4.20-06	3.60-06	3.11-06	2.71-06	2.37-06	2.08-06	1.84-06	1.64-06	1.46-06	1.31-06	1.18-06
45	9.63-06	8.03-06	6.77-06	5.76-06	4.94-06	4.26-06	3.71-06	3.24-06	2.85-06	2.52-06	2.24-06	2.00-06	1.79-06	1.61-06
40	1.37-05	1.14-05	9.64-06	8.20-06	7.03-06	6.07-06	5.27-06	4.61-06	4.06-06	3.58-06	3.18-06	2.84-06	2.54-06	2.28-06
35	2.05-05	1.71-05	1.44-05	1.22-05	1.05-05	9.04-06	7.85-06	6.86-06	6.02-06	5.32-06	4.71-06	4.19-06	3.74-06	3.34-06
30	3.26-05	2.71-05	2.28-05	1.94-05	1.66-05	1.43-05	1.24-05	1.08-05	9.41-06	8.25-06	7.24-06	6.33-06	5.47-06	4.86-06
29	3.61-05	3.00-05	2.52-05	2.14-05	1.83-05	1.58-05	1.36-05	1.19-05	1.03-05	9.03-06	7.86-06	6.76-06	5.49-06	
28	4.01-05	3.33-05	2.80-05	2.38-05	2.03-05	1.74-05	1.51-05	1.31-05	1.14-05	9.84-06	8.43-06	6.82-06		
27	4.47-05	3.72-05	3.12-05	2.64-05	2.26-05	1.94-05	1.67-05	1.44-05	1.24-05	1.06-05	8.53-06			
26	5.00-05	4.16-05	3.49-05	2.95-05	2.51-05	2.15-05	1.85-05	1.59-05	1.34-05	1.08-05				
25	5.62-05	4.67-05	3.91-05	3.31-05	2.81-05	2.40-05	2.04-05	1.72-05	1.37-05					
24	6.34-05	5.26-05	4.41-05	3.71-05	3.14-05	2.66-05	2.23-05	1.77-05						
23	7.19-05	5.96-05	4.98-05	4.18-05	3.51-05	2.92-05	2.30-05							
22	8.19-05	6.77-05	5.63-05	4.69-05	3.88-05	3.03-05								
21	9.37-05	7.71-05	6.37-05	5.22-05	4.05-05									
20	1.08-04	8.79-05	7.13-05	5.49-05										
19	1.24-04	9.92-05	7.57-05											
18	1.41-04	1.06-04												
17	1.52-04													

HE + TE = 3.00+04 NE = 1.00+12 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.88-33	-7.41-40	-1.43-38	-4.46-38	-9.55-38	-1.37-37	-9.81-38	5.29-38	3.05-37	6.48-37	1.08-36	1.61-36	2.26-36	3.04-36
45	3.95-33	-1.05-39	-1.98-38	-6.21-38	-1.34-37	-1.93-37	-1.41-37	6.80-38	4.23-37	9.11-37	1.54-36	2.31-36	3.28-36	4.46-36
40	5.64-33	-1.54-39	-2.86-38	-9.03-38	-1.96-37	-2.85-37	-2.16-37	8.68-38	6.11-37	1.34-36	2.30-36	3.51-36	5.05-36	6.98-36
35	8.44-33	+2.43-39	-4.37-38	-1.39-37	-3.04-37	-4.51-37	-3.56-37	1.05-37	9.29-37	2.11-36	3.70-36	5.77-36	8.48-36	1.20-35
30	1.35-32	-4.17-39	-7.15-38	-2.30-37	-5.13-37	-7.81-37	-6.58-37	9.57-38	1.51-36	3.63-36	6.61-36	1.07-35	1.63-35	2.42-35
29	1.49-32	-4.70-39	-8.03-38	-2.58-37	-5.77-37	-8.85-37	-7.57-37	8.22-38	1.68-36	4.11-36	7.55-36	1.24-35	1.91-35	2.86-35
28	1.66-32	-5.34-39	-9.01-38	-2.91-37	-6.53-37	-1.01-36	-8.78-37	6.04-38	1.88-36	4.67-36	8.69-36	1.44-35	2.25-35	3.42-35
27	1.85-32	-6.09-39	-1.02-37	-3.29-37	-7.43-37	-1.16-36	-1.03-36	2.66-38	2.10-36	5.35-36	1.01-35	1.70-35	2.69-35	4.15-35
26	2.08-32	-7.00-39	-1.15-37	-3.74-37	-8.51-37	-1.34-36	-1.21-36	-2.51-38	2.37-36	6.17-36	1.18-35	2.02-35	3.26-35	5.13-35
25	2.34-32	-8.09-39	-1.31-37	-4.29-37	-9.81-37	-1.56-36	-1.45-36	-1.03-37	2.67-36	7.17-36	1.40-35	2.44-35	4.02-35	6.48-35
24	2.65-32	-9.43-39	-1.51-37	-4.95-37	-1.14-36	-1.84-36	-1.75-36	-2.20-37	3.03-36	8.42-36	1.68-35	2.99-35	5.05-35	8.38-35
23	3.02-32	-1.11-38	-1.74-37	-5.75-37	-1.34-36	-2.18-36	-2.14-36	-3.97-37	3.44-36	9.98-36	2.05-35	3.74-35	6.51-35	1.12-34
22	3.46-32	-1.31-38	-2.03-37	-6.75-37	-1.59-36	-2.63-36	-2.65-36	-6.66-37	3.91-36	1.20-35	2.54-35	4.79-35	8.65-35	1.56-34
21	3.99-32	-1.57-38	-2.39-37	-8.00-37	-1.90-36	-3.20-36	-3.35-36	-1.08-36	4.43-36	1.46-35	3.22-35	6.31-35	1.20-34	2.29-34
20	4.64-32	-1.90-38	-2.84-37	-9.58-37	-2.31-36	-3.97-36	-4.31-36	-1.73-36	5.01-36	1.80-35	4.19-35	8.65-35	1.74-34	3.62-34
19	5.44-32	-2.33-38	-3.41-37	-1.15-36	-2.85-36	-5.01-36	-5.69-36	-2.78-36	5.55-36	2.27-35	5.63-35	1.24-34	2.72-34	6.38-34
18	6.42-32	-2.90-38	-4.14-37	-1.43-36	-3.57-36	-6.47-36	-7.72-36	-4.54-36	5.88-36	2.92-35	7.89-35	1.91-34	4.74-34	1.34-33
17	7.67-32	-3.65-38	-5.11-37	-1.79-36	-4.57-36	-8.56-36	-1.08-35	-7.60-36	5.55-36	3.84-35	1.17-34	3.25-34	9.76-34	3.88-33
16	9.26-32	-4.68-38	-6.42-37	-2.29-36	-6.01-36	-1.17-35	-1.58-35	-1.32-35	3.30-36	5.18-35	1.90-34	6.47-34	2.75-33	2.45-32
15	1.13-31	-6.09-38	-8.21-37	-3.00-36	-8.12-36	-1.66-35	-2.43-35	-2.42-35	-4.53-36	7.09-35	3.52-34	1.74-33	1.68-32	
14	1.41-31	-8.07-38	-1.07-36	-4.03-36	-1.14-35	-2.47-35	-3.98-35	-4.79-35	-3.02-35	9.24-35	8.34-34	9.82-33		
13	1.78-31	-1.09-37	-1.44-36	-5.60-36	-1.67-35	-3.91-35	-7.11-35	-1.06-34	-1.24-34	4.84-35	3.67-33			
12	2.30-31	-1.48-37	-1.98-36	-8.09-36	-2.58-35	-6.71-35	-1.43-34	-2.81-34	-5.93-34	-1.59-33				
11	3.05-31	-2.00-37	-2.80-36	-1.22-35	-4.28-35	-1.29-34	-3.45-34	-1.03-33	-5.72-33					
10	4.17-31	-2.58-37	-4.06-36	-1.94-35	-7.79-35	-2.91-34	-1.15-33	-8.17-33						
9	5.94-31	-2.82-37	-5.92-36	-3.24-35	-1.61-34	-8.78-34	-8.13-33							
8	8.92-31	-1.22-37	-8.38-36	-5.73-35	-4.15-34	-5.31-33								
7	1.44-30	6.21-37	-1.09-35	-1.12-34	-1.91-33									
6	2.59-30	2.87-36	-1.34-35	-3.71-34										
5	5.53-30	1.08-35	-1.46-35											
4	1.65-29	7.04-35												
3	1.20-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.99-36	5.13-36	6.51-36	8.17-36	1.02-35	1.26-35	1.55-35	1.91-35	2.34-35	2.86-35	3.50-35	4.29-35	5.27-35	6.49-35
45	5.91-36	7.70-36	9.90-36	1.26-35	1.60-35	2.01-35	2.53-35	3.17-35	3.97-35	4.99-35	6.29-35	7.95-35	1.01-34	1.29-34
40	9.41-36	1.25-35	1.64-35	2.13-35	2.77-35	3.58-35	4.64-35	6.03-35	7.86-35	1.03-34	1.36-34	1.82-34	2.47-34	3.41-34
35	1.67-35	2.28-35	3.09-35	4.18-35	5.65-35	7.68-35	1.05-34	1.46-34	2.04-34	2.92-34	4.29-34	6.50-34	1.03-33	1.72-33
30	3.51-35	5.07-35	7.32-35	1.06-34	1.57-34	2.36-34	3.66-34	5.91-34	1.01-33	1.85-33	3.81-33	9.40-33	3.24-32	2.49-31
29	4.21-35	6.17-35	9.09-35	1.35-34	2.05-34	3.21-34	5.20-34	8.89-34	1.64-33	3.39-33	8.41-33	2.90-32	2.23-31	
28	5.12-35	7.66-35	1.16-34	1.77-34	2.78-34	4.54-34	7.82-34	1.45-33	3.01-33	7.49-33	2.59-32	1.99-31		
27	6.35-35	9.72-35	1.51-34	2.39-34	3.93-34	6.82-34	1.27-33	2.65-33	6.63-33	2.31-32	1.78-31			
26	8.03-35	1.27-34	2.03-34	3.37-34	5.89-34	1.11-33	2.32-33	5.83-33	2.04-32	1.58-31				
25	1.04-34	1.70-34	2.86-34	5.04-34	9.53-34	2.01-33	5.08-33	1.78-32	1.39-31					
24	1.40-34	2.39-34	4.26-34	8.13-34	1.73-33	4.40-33	1.55-32	1.21-31						
23	1.95-34	3.54-34	6.85-34	1.47-33	3.76-33	1.34-32	1.05-31							
22	2.89-34	5.67-34	1.23-33	3.19-33	1.14-32	9.01-32								
21	4.60-34	1.02-33	2.66-33	9.61-33	7.68-32									
20	8.19-34	2.18-33	7.98-33	6.43-32										
19	1.74-33	6.48-33	5.29-32											
18	5.12-33	4.25-32												
17	3.31-32													

HE + TE = 3.00+04 NE = 1.00+13 CASE B NC = 20

TOTAL RC = 1.028-12 4-3 RC = 1.462-13 4-3 EM = 6.194-25 2S RC = 2.313-13 2P RC = 7.972-13

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.50-03	7.66-04	3.29-04	1.70-04	9.94-05	6.30-05	4.24-05	2.99-05	2.18-05	1.64-05	1.27-05	1.00-05	8.01-06	6.52-06
45	3.43-03	1.05-03	4.52-04	2.34-04	1.37-04	8.65-05	5.82-05	4.10-05	3.00-05	2.26-05	1.74-05	1.37-05	1.10-05	8.95-06
40	4.90-03	1.50-03	6.45-04	3.34-04	1.95-04	1.23-04	8.31-05	5.85-05	4.28-05	3.22-05	2.48-05	1.96-05	1.57-05	1.28-05
35	7.34-03	2.25-03	9.67-04	5.01-04	2.92-04	1.85-04	1.24-04	8.76-05	6.40-05	4.82-05	3.72-05	2.93-05	2.34-05	1.91-05
30	1.17-02	3.59-03	1.54-03	7.99-04	4.66-04	2.95-04	1.98-04	1.40-04	1.02-04	7.68-05	5.92-05	4.66-05	3.73-05	3.03-05
29	1.30-02	3.99-03	1.71-03	8.86-04	5.17-04	3.27-04	2.20-04	1.55-04	1.13-04	8.51-05	6.56-05	5.16-05	4.13-05	3.36-05
28	1.45-02	4.44-03	1.91-03	9.86-04	5.75-04	3.64-04	2.45-04	1.72-04	1.26-04	9.46-05	7.30-05	5.74-05	4.59-05	3.73-05
27	1.62-02	4.96-03	2.13-03	1.10-03	6.42-04	4.07-04	2.73-04	1.92-04	1.41-04	1.06-04	8.14-05	6.40-05	5.13-05	4.16-05
26	1.81-02	5.56-03	2.39-03	1.24-03	7.21-04	4.56-04	3.07-04	2.16-04	1.58-04	1.18-04	9.13-05	7.18-05	5.74-05	4.66-05
25	2.05-02	6.27-03	2.69-03	1.39-03	8.12-04	5.14-04	3.45-04	2.43-04	1.78-04	1.33-04	1.03-04	8.08-05	6.46-05	5.24-05
24	2.32-02	7.11-03	3.05-03	1.58-03	9.20-04	5.82-04	3.91-04	2.75-04	2.01-04	1.51-04	1.16-04	9.14-05	7.31-05	5.93-05
23	2.64-02	8.10-03	3.48-03	1.80-03	1.05-03	6.63-04	4.46-04	3.14-04	2.29-04	1.72-04	1.32-04	1.04-04	8.30-05	6.73-05
22	3 03-02	9.29-03	3.99-03	2.06-03	1.20-03	7.60-04	5.10-04	3.59-04	2.62-04	1.97-04	1.51-04	1.19-04	9.48-05	7.68-05
21	3.50-02	1.07-02	4.60-03	2.38-03	1.39-03	8.77-04	5.89-04	4.14-04	3.02-04	2.27-04	1.74-04	1.37-04	1.09-04	8.81-05
20	4.07-02	1.25-02	5.35-03	2.77-03	1.61-03	1.02-03	6.84-04	4.81-04	3.50-04	2.63-04	2.02-04	1.58-04	1.26-04	1.02-04
19	4.77-02	1.46-02	6.27-03	3.24-03	1.89-03	1.19-03	8.00-04	5.62-04	4.10-04	3.07-04	2.36-04	1.84-04	1.46-04	1.18-04
18	5.64-02	1.73-02	7.42-03	3.83-03	2.23-03	1.41-03	9.45-04	6.64-04	4.83-04	3.62-04	2.77-04	2.16-04	1.71-04	1.36-04
17	6.75-02	2.07-02	8.86-03	4.58-03	2.66-03	1.68-03	1.13-03	7.91-04	5.75-04	4.30-04	3.29-04	2.55-04	2.01-04	1.57-04
16	8.16-02	2.50-02	1.07-02	5.53-03	3.22-03	2.03-03	1.36-03	9.53-04	6.92-04	5.16-04	3.93-04	3.03-04	2.34-04	1.72-04
15	1.00-01	3.06-02	1.31-02	6.78-03	3.94-03	2.48-03	1.66-03	1.16-03	8.42-04	6.25-04	4.72-04	3.58-04	2.60-04	
14	1.25-01	3.81-02	1.63-02	8.42-03	4.89-03	3.08-03	2.06-03	1.44-03	1.04-03	7.63-04	5.67-04	4.04-04		
13	1.58-01	4.83-02	2.07-02	1.06-02	6.18-03	3.88-03	2.59-03	1.80-03	1.29-03	9.33-04	6.52-04			
12	2.04-01	6.24-02	2.67-02	1.37-02	7.95-03	4.99-03	3.31-03	2.28-03	1.61-03	1.09-03				
11	2.70-01	8.25-02	3.53-02	1.81-02	1.05-02	6.54-03	4.31-03	2.92-03	1.93-03					
10	3.68-01	1.12-01	4.79-02	2.45-02	1.41-02	8.75-03	5.66-03	3.61-03						
9	5.16-01	1.57-01	6.69-02	3.41-02	1.95-02	1.19-02	7.23-03							
8	7.45-01	2.26-01	9.59-02	4.86-02	2.73-02	1.56-02								
7	1.09+00	3.30-01	1.39-01	6.91-02	3.65-02									
6	1.56+00	4.67-01	1.93-01	9.04-02										
5	2.17+00	6.39-01	2.48-01											
4	3.61+00	1.00+00												
3	8.94+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.38-06	4.49-06	3.78-06	3.22-06	2.76-06	2.38-06	2.07-06	1.82-06	1.60-06	1.41-06	1.26-06	1.12-06	1.00-06	9.04-07
45	7.38-06	6.16-06	5.19-06	4.41-06	3.78-06	3.27-06	2.84-06	2.49-06	2.19-06	1.94-06	1.72-06	1.53-06	1.37-06	1.24-06
40	1.05-05	8.77-06	7.39-06	6.28-06	5.39-06	4.65-06	4.04-06	3.54-06	3.11-06	2.75-06	2.44-06	2.18-06	1.95-06	1.75-06
35	1.57-05	1.31-05	1.10-05	9.38-06	8.03-06	6.93-06	6.02-06	5.26-06	4.62-06	4.08-06	3.61-06	3.21-06	2.86-06	2.56-06
30	2.50-05	2.08-05	1.75-05	1.49-05	1.27-05	1.09-05	9.48-06	8.25-06	7.22-06	6.33-06	5.55-06	4.86-06	4.19-06	3.42-06
29	2.76-05	2.30-05	1.94-05	1.64-05	1.40-05	1.21-05	1.05-05	9.09-06	7.93-06	6.92-06	6.03-06	5.18-06	4.21-06	
28	3.07-05	2.56-05	2.15-05	1.82-05	1.56-05	1.34-05	1.16-05	1.00-05	8.71-06	7.55-06	6.46-06	5.23-06		
27	3.42-05	2.85-05	2.39-05	2.03-05	1.73-05	1.48-05	1.28-05	1.11-05	9.54-06	8.12-06	6.54-06			
26	3.83-05	3.19-05	2.68-05	2.26-05	1.93-05	1.65-05	1.42-05	1.22-05	1.03-05	8.26-06				
25	4.31-05	3.58-05	3.00-05	2.54-05	2.16-05	1.84-05	1.57-05	1.32-05	1.05-05					
24	4.87-05	4.04-05	3.38-05	2.85-05	2.41-05	2.06-05	1.71-05	1.36-05						
23	5.52-05	4.57-05	3.82-05	3.21-05	2.69-05	2.24-05	1.77-05							
22	6.29-05	5.20-05	4.32-05	3.60-05	2.97-05	2.33-05								
21	7.20-05	5.92-05	4.89-05	4.01-05	3.11-05									
20	8.26-05	6.75-05	5.48-05	4.22-05										
19	9.50-05	7.63-05	5.32-05											
18	1.08-04	8.18-05												
17	1.17-04													

HE + TE = 3.00+04 NE = 1.00+13 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.99-34	-5.37-40	-7.79-39	-1.14-38	3.16-38	1.47-37	3.19-37	5.42-37	8.22-37	1.17-36	1.60-36	2.12-36	2.76-36	3.54-36
45	5.47-34	-7.62-40	-1.09-38	-1.62-38	4.32-38	2.04-37	4.45-37	7.60-37	1.16-36	1.66-36	2.28-36	3.06-36	4.02-36	5.21-36
40	7.81-34	-1.14-39	-1.58-38	-2.40-38	6.10-38	2.94-37	6.48-37	1.12-36	1.72-36	2.48-36	3.45-36	4.68-36	6.24-36	8.20-36
35	1.17-33	-1.81-39	-2.43-38	-3.79-38	8.98-38	4.47-37	1.00-36	1.74-36	2.72-36	3.99-36	5.64-36	7.79-36	1.06-35	1.42-35
30	1.87-33	-3.17-39	-4.05-38	-6.56-38	1.39-37	7.32-37	1.67-36	2.98-36	4.74-36	7.12-36	1.03-35	1.47-35	2.07-35	2.90-35
29	2.07-33	-3.60-39	-4.53-38	-7.42-38	1.53-37	8.17-37	1.88-36	3.36-36	5.38-36	8.14-36	1.19-35	1.71-35	2.43-35	3.45-35
28	2.30-33	-4.10-39	-5.11-38	-8.45-38	1.69-37	9.15-37	2.12-36	3.81-36	6.15-36	9.37-36	1.38-35	2.01-35	2.89-35	4.14-35
27	2.57-33	-4.71-39	-5.78-38	-9.69-38	1.87-37	1.03-36	2.40-36	4.35-36	7.07-36	1.09-35	1.62-35	2.38-35	3.47-35	5.06-35
26	2.88-33	-5.44-39	-6.58-38	-1.12-37	2.07-37	1.17-36	2.74-36	5.01-36	8.21-36	1.27-35	1.92-35	2.86-35	4.23-35	6.29-35
25	3.25-33	-6.33-39	-7.55-38	-1.30-37	2.29-37	1.33-36	3.15-36	5.81-36	9.62-36	1.51-35	2.31-35	3.48-35	5.26-35	8.00-35
24	3.68-33	-7.43-39	-8.71-38	-1.53-37	2.55-37	1.52-36	3.65-36	6.80-36	1.14-35	1.81-35	2.81-35	4.32-35	6.68-35	1.04-34
23	4.19-33	-8.80-39	-1.01-37	-1.81-37	2.84-37	1.75-36	4.27-36	8.04-36	1.36-35	2.20-35	3.48-35	5.48-35	8.70-35	1.41-34
22	4.80-33	-1.05-38	-1.19-37	-2.16-37	3.16-37	2.04-36	5.03-36	9.62-36	1.66-35	2.73-35	4.41-35	7.13-35	1.17-34	1.98-34
21	5.54-33	-1.27-38	-1.41-37	-2.62-37	3.52-37	2.39-36	6.01-36	1.17-35	2.05-35	3.45-35	5.73-35	9.59-35	1.65-34	2.95-34
20	6.43-33	-1.56-38	-1.69-37	-3.22-37	3.91-37	2.83-36	7.27-36	1.44-35	2.59-35	4.47-35	7.69-35	1.35-34	2.45-34	4.75-34
19	7.53-33	-1.94-38	-2.05-37	-4.02-37	4.31-37	3.39-36	8.92-36	1.81-35	3.34-35	5.98-35	1.07-34	1.99-34	3.92-34	8.56-34
18	8.90-33	-2.44-38	-2.53-37	-5.11-37	4.67-37	4.12-36	1.12-35	2.33-35	4.46-35	8.34-35	1.59-34	3.18-34	7.05-34	1.85-33
17	1.06-32	-3.13-38	-3.17-37	-6.63-37	4.93-37	5.06-36	1.43-35	3.09-35	6.18-35	1.23-34	2.53-34	5.69-34	1.51-33	5.54-33
16	1.28-32	-4.11-38	-4.05-37	-8.83-37	4.88-37	6.33-36	1.87-35	4.26-35	9.03-35	1.94-34	4.49-34	1.22-33	4.51-33	3.67-32
15	1.57-32	-5.50-38	-5.29-37	-1.21-36	4.13-37	8.07-36	2.54-35	6.16-35	1.42-34	3.42-34	9.51-34	3.60-33	2.97-32	
14	1.95-32	-7.58-38	-7.12-37	-1.72-36	1.80-37	1.05-35	3.61-35	9.55-35	2.47-34	7.18-34	2.79-33	2.34-32		
13	2.47-32	-1.08-37	-9.91-37	-2.55-36	-4.19-37	1.41-35	5.44-35	1.64-34	5.11-34	2.07-33	1.79-32			
12	3.19-32	-1.58-37	-1.44-36	-4.00-36	-1.91-36	1.93-35	8.95-35	3.29-34	1.44-33	1.31-32				
11	4.23-32	-2.42-37	-2.19-36	-6.71-36	-5.74-36	2.68-35	1.69-34	8.90-34	8.80-33					
10	5.78-32	-3.88-37	-3.56-36	-1.23-35	-1.66-35	3.49-35	4.08-34	5.05-33						
9	8.23-32	-6.52-37	-6.26-36	-2.56-35	-5.35-35	1.32-35	1.83-33							
8	1.24-31	-1.14-36	-1.21-35	-6.31-35	-2.26-34	-7.09-34								
7	1.99-31	-1.95-36	-2.63-35	-2.06-34	-1.96-33									
6	3.58-31	-2.61-36	-6.37-35	-1.25-33										
5	7.67-31	1.05-36	-2.02-34											
4	2.29-30	4.67-35												
3	1.66-29													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.49-36	5.64-36	7.02-36	8.69-36	1.07-35	1.32-35	1.61-35	1.97-35	2.40-35	2.93-35	3.58-35	4.37-35	5.36-35	6.58-35
45	6.67-36	8.48-36	1.07-35	1.34-35	1.68-35	2.10-35	2.62-35	3.27-35	4.09-35	5.12-35	6.43-35	8.10-35	1.03-34	1.31-34
40	1.07-35	1.38-35	1.78-35	2.28-35	2.93-35	3.76-35	4.84-35	6.25-35	8.10-35	1.06-34	1.40-34	1.86-34	2.52-34	3.47-34
35	1.90-35	2.53-35	3.37-35	4.49-35	6.01-35	8.10-35	1.10-34	1.51-34	2.11-34	3.02-34	4.41-34	6.66-34	1.05-33	1.76-33
30	4.06-35	5.70-35	8.07-35	1.16-34	1.68-34	2.51-34	3.87-34	6.19-34	1.05-33	1.92-33	3.94-33	9.71-33	3.34-32	2.55-31
29	4.89-35	6.98-35	1.01-34	1.48-34	2.21-34	3.42-34	5.50-34	9.34-34	1.72-33	3.53-33	8.73-33	3.01-32	2.31-31	
28	5.97-35	8.69-35	1.28-34	1.93-34	3.00-34	4.85-34	8.29-34	1.53-33	3.15-33	7.82-33	2.70-32	2.07-31		
27	7.43-35	1.11-34	1.68-34	2.62-34	4.26-34	7.31-34	1.35-33	2.80-33	6.96-33	2.41-32	1.86-31			
26	9.46-35	1.45-34	2.28-34	3.72-34	6.41-34	1.19-33	2.48-33	6.18-33	2.15-32	1.66-31				
25	1.24-34	1.96-34	3.22-34	5.58-34	1.04-33	2.18-33	5.45-33	1.90-32	1.47-31					
24	1.67-34	2.77-34	4.83-34	9.06-34	1.90-33	4.78-33	1.67-32	1.30-31						
23	2.36-34	4.14-34	7.82-34	1.65-33	4.16-33	1.46-32	1.14-31							
22	3.51-34	6.69-34	1.42-33	3.60-33	1.27-32	9.93-32								
21	5.67-34	1.21-33	3.10-33	1.10-32	8.63-32									
20	1.03-33	2.64-33	9.41-33	7.42-32										
19	2.22-33	7.98-33	6.33-32											
18	6.69-33	5.35-32												
17	4.46-32													

HE + TE = 5.00+04 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 4.287-13 4-3 RC = 6.129-14 4-3 EM = 2.597-25 2S RC = 1.430-13 2P RC = 2.857-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.35-03	4.53-04	2.16-04	1.22-04	7.58-05	5.04-05	3.53-05	2.57-05	1.92-05	1.48-05	1.16-05	9.29-06	7.54-06	6.20-06
45	1.84-03	6.19-04	2.96-04	1.67-04	1.04-04	6.93-05	4.85-05	3.53-05	2.65-05	2.03-05	1.60-05	1.28-05	1.04-05	8.53-06
40	2.60-03	8.78-04	4.21-04	2.38-04	1.48-04	9.87-05	6.91-05	5.03-05	3.77-05	2.90-05	2.28-05	1.82-05	1.48-05	1.22-05
35	3.87-03	1.31-03	6.28-04	3.55-04	2.21-04	1.47-04	1.03-04	7.51-05	5.64-05	4.34-05	3.40-05	2.72-05	2.21-05	1.82-05
30	6.13-03	2.07-03	9.96-04	5.63-04	3.51-04	2.34-04	1.64-04	1.19-04	8.96-05	6.89-05	5.41-05	4.33-05	3.51-05	2.89-05
29	6.79-03	2.30-03	1.10-03	6.23-04	3.89-04	2.59-04	1.82-04	1.32-04	9.92-05	7.63-05	6.00-05	4.79-05	3.89-05	3.20-05
28	7.54-03	2.55-03	1.22-03	6.92-04	4.32-04	2.88-04	2.02-04	1.47-04	1.10-04	8.48-05	6.66-05	5.33-05	4.32-05	3.55-05
27	8.40-03	2.84-03	1.37-03	7.72-04	4.82-04	3.21-04	2.25-04	1.64-04	1.23-04	9.47-05	7.43-05	5.94-05	4.82-05	3.96-05
26	9.41-03	3.18-03	1.53-03	8.65-04	5.40-04	3.60-04	2.52-04	1.84-04	1.38-04	1.06-04	8.33-05	6.66-05	5.40-05	4.43-05
25	1.06-02	3.58-03	1.72-03	9.73-04	6.07-04	4.05-04	2.84-04	2.07-04	1.55-04	1.19-04	9.37-05	7.49-05	6.07-05	4.98-05
24	1.20-02	4.04-03	1.94-03	1.10-03	6.86-04	4.58-04	3.21-04	2.34-04	1.75-04	1.35-04	1.06-04	8.47-05	6.86-05	5.63-05
23	1.36-02	4.59-03	2.21-03	1.25-03	7.80-04	5.21-04	3.65-04	2.66-04	1.99-04	1.53-04	1.20-04	9.62-05	7.79-05	6.39-05
22	1.55-02	5.24-03	2.52-03	1.43-03	8.91-04	5.95-04	4.17-04	3.04-04	2.28-04	1.75-04	1.38-04	1.10-04	8.90-05	7.29-05
21	1.78-02	6.03-03	2.90-03	1.64-03	1.03-03	6.85-04	4.80-04	3.50-04	2.62-04	2.02-04	1.58-04	1.26-04	1.02-04	8.35-05
20	2.06-02	6.98-03	3.36-03	1.90-03	1.19-03	7.93-04	5.56-04	4.05-04	3.04-04	2.34-04	1.83-04	1.46-04	1.18-04	9.62-05
19	2.41-02	8.13-03	3.91-03	2.22-03	1.39-03	9.26-04	6.50-04	4.73-04	3.55-04	2.73-04	2.14-04	1.70-04	1.37-04	1.11-04
18	2.83-02	9.56-03	4.60-03	2.61-03	1.63-03	1.09-03	7.65-04	5.57-04	4.18-04	3.21-04	2.51-04	2.00-04	1.60-04	1.29-04
17	3.36-02	1.14-02	5.47-03	3.10-03	1.94-03	1.30-03	9.10-04	6.63-04	4.97-04	3.81-04	2.98-04	2.35-04	1.87-04	1.47-04
16	4.03-02	1.36-02	6.56-03	3.72-03	2.33-03	1.56-03	1.09-03	7.96-04	5.96-04	4.57-04	3.55-04	2.79-04	2.17-04	1.57-04
15	4.89-02	1.65-02	7.97-03	4.52-03	2.83-03	1.89-03	1.33-03	9.68-04	7.24-04	5.53-04	4.26-04	3.27-04	2.36-04	
14	6.02-02	2.03-02	9.81-03	5.58-03	3.49-03	2.34-03	1.64-03	1.19-03	8.89-04	6.74-04	5.10-04	3.62-04		
13	7.53-02	2.54-02	1.23-02	6.98-03	4.38-03	2.93-03	2.05-03	1.49-03	1.10-03	8.21-04	5.76-04			
12	9.59-02	3.24-02	1.56-02	8.91-03	5.59-03	3.74-03	2.62-03	1.89-03	1.37-03	9.50-04				
11	1.25-01	4.21-02	2.04-02	1.16-02	7.29-03	4.87-03	3.40-03	2.41-03	1.64-03					
10	1.67-01	5.63-02	2.73-02	1.56-02	9.77-03	6.51-03	4.47-03	2.97-03						
9	2.30-01	7.77-02	3.77-02	2.15-02	1.35-02	8.89-03	5.74-03							
8	3.31-01	1.12-01	5.42-02	3.10-02	1.93-02	1.20-02								
7	5.01-01	1.69-01	8.23-02	4.68-02	2.77-02									
6	8.15-01	2.74-01	1.33-01	7.29-02										
5	1.47+00	4.91-01	2.32-01											
4	3.12+00	1.00+00												
3	8.81+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.16-06	4.34-06	3.68-06	3.15-06	2.72-06	2.36-06	2.06-06	1.81-06	1.59-06	1.41-06	1.26-06	1.12-06	1.01-06	9.06-07
45	7.10-06	5.97-06	5.06-06	4.33-06	3.73-06	3.24-06	2.82-06	2.48-06	2.19-06	1.94-06	1.72-06	1.54-06	1.38-06	1.24-06
40	1.01-05	8.50-06	7.21-06	6.17-06	5.31-06	4.61-06	4.02-06	3.52-06	3.10-06	2.75-06	2.44-06	2.17-06	1.94-06	1.74-06
35	1.51-05	1.27-05	1.08-05	9.20-06	7.92-06	6.86-06	5.97-06	5.23-06	4.60-06	4.06-06	3.59-06	3.19-06	2.84-06	2.52-06
30	2.40-05	2.01-05	1.71-05	1.46-05	1.25-05	1.08-05	9.37-06	8.16-06	7.12-06	6.22-06	5.42-06	4.69-06	3.98-06	3.16-06
29	2.66-05	2.23-05	1.89-05	1.61-05	1.38-05	1.19-05	1.03-05	8.96-06	7.79-06	6.77-06	5.84-06	4.94-06	3.89-06	
28	2.95-05	2.48-05	2.09-05	1.78-05	1.53-05	1.32-05	1.14-05	9.85-06	8.51-06	7.31-06	6.16-06	4.84-06		
27	3.29-05	2.76-05	2.33-05	1.98-05	1.70-05	1.46-05	1.26-05	1.08-05	9.24-06	7.75-06	6.06-06			
26	3.68-05	3.08-05	2.60-05	2.21-05	1.89-05	1.62-05	1.39-05	1.18-05	9.84-06	7.66-06				
25	4.14-05	3.46-05	2.92-05	2.48-05	2.11-05	1.79-05	1.52-05	1.26-05	9.77-06					
24	4.67-05	3.90-05	3.28-05	2.78-05	2.35-05	1.98-05	1.63-05	1.26-05						
23	5.29-05	4.41-05	3.70-05	3.11-05	2.60-05	2.14-05	1.64-05							
22	6.02-05	5.01-05	4.18-05	3.47-05	2.84-05	2.16-05								
21	6.88-05	5.69-05	4.70-05	3.82-05	2.89-05									
20	7.89-05	6.46-05	5.21-05	3.91-05										
19	9.03-05	7.22-05	5.39-05											
18	1.02-04	7.55-05												
17	1.08-04													

HE + TE = 5.00+04 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.37-29	3.52-39	4.31-39	6.39-39	9.63-39	1.42-38	2.03-38	2.81-38	3.77-38	4.93-38	6.30-38	7.86-38	9.58-38	1.14-37
45	4.63-29	4.81-39	5.89-39	8.74-39	1.32-38	1.94-38	2.76-38	3.79-38	5.04-38	6.51-38	8.15-38	9.90-38	1.16-37	1.31-37
40	6.61-29	6.85-39	8.40-39	1.25-38	1.90-38	2.80-38	4.00-38	5.50-38	7.32-38	9.41-38	1.17-37	1.40-37	1.60-37	1.73-37
35	9.89-29	1.03-38	1.26-38	1.90-38	2.90-38	4.33-38	6.24-38	8.68-38	1.16-37	1.51-37	1.88-37	2.24-37	2.53-37	2.60-37
30	1.58-28	1.64-38	2.04-38	3.09-38	4.80-38	7.29-38	1.07-37	1.52-37	2.07-37	2.73-37	3.46-37	4.19-37	4.59-37	4.36-37
29	1.75-28	1.82-38	2.27-38	3.45-38	5.38-38	8.20-38	1.21-37	1.72-37	2.37-37	3.14-37	3.98-37	4.78-37	5.26-37	4.84-37
28	1.95-28	2.03-38	2.53-38	3.86-38	6.05-38	9.27-38	1.37-37	1.97-37	2.72-37	3.63-37	4.62-37	5.56-37	6.06-37	5.34-37
27	2.17-28	2.27-38	2.83-38	4.35-38	6.84-38	1.05-37	1.57-37	2.27-37	3.15-37	4.23-37	5.42-37	6.51-37	7.01-37	5.78-37
26	2.44-28	2.55-38	3.19-38	4.91-38	7.77-38	1.21-37	1.81-37	2.63-37	3.69-37	4.97-37	6.40-37	7.69-37	8.13-37	6.03-37
25	2.75-28	2.87-38	3.61-38	5.59-38	8.89-38	1.39-37	2.10-37	3.08-37	4.35-37	5.91-37	7.65-37	9.17-37	9.41-37	5.77-37
24	3.11-28	3.26-38	4.11-38	6.40-38	1.02-37	1.61-37	2.46-37	3.63-37	5.18-37	7.10-37	9.24-37	1.10-36	1.08-36	4.27-37
23	3.55-28	3.72-38	4.71-38	7.37-38	1.19-37	1.89-37	2.91-37	4.34-37	6.25-37	8.65-37	1.13-36	1.33-36	1.21-36	-1.36-38
22	4.07-28	4.27-38	5.43-38	8.55-38	1.39-37	2.23-37	3.47-37	5.24-37	7.65-37	1.07-36	1.40-36	1.62-36	1.25-36	-1.17-36
21	4.69-28	4.94-38	6.31-38	1.00-37	1.64-37	2.67-37	4.20-37	6.43-37	9.51-37	1.35-36	1.77-36	1.96-36	1.02-36	-4.21-36
20	5.45-28	5.75-38	7.39-38	1.18-37	1.97-37	3.23-37	5.16-37	8.02-37	1.20-36	1.73-36	2.26-36	2.30-36	-9.94-38	-1.27-35
19	6.38-28	6.75-38	8.74-38	1.41-37	2.38-37	3.96-37	6.45-37	1.02-36	1.56-36	2.26-36	2.92-36	2.42-36	-4.13-36	-4.02-35
18	7.55-28	8.01-38	1.04-37	1.71-37	2.92-37	4.95-37	8.22-37	1.33-36	2.08-36	3.05-36	3.75-36	1.38-36	-1.91-35	-1.52-34
17	9.02-28	9.60-38	1.26-37	2.10-37	3.64-37	6.31-37	1.07-36	1.76-36	2.86-36	4.21-36	4.52-36	-5.00-36	-8.59-35	-8.50-34
16	1.09-27	1.17-37	1.55-37	2.61-37	4.64-37	8.25-37	1.45-36	2.48-36	4.09-36	5.92-36	3.57-36	-4.01-35	-5.34-34	-1.22-32
15	1.33-27	1.44-37	1.93-37	3.32-37	6.06-37	1.11-36	2.03-36	3.62-36	6.14-36	8.06-36	-1.04-35	-3.05-34	-8.34-33	
14	1.66-27	1.80-37	2.46-37	4.33-37	8.16-37	1.56-36	2.98-36	5.61-36	9.67-36	6.85-36	-1.48-34	-5.33-33		
13	2.10-27	2.29-37	3.20-37	5.82-37	1.14-36	2.30-36	4.70-36	9.43-36	1.52-35	-4.81-35	-3.13-33			
12	2.72-27	3.00-37	4.29-37	8.11-37	1.68-36	3.65-36	8.14-36	1.76-35	8.30-36	-1.62-33				
11	3.60-27	4.03-37	5.96-37	1.19-36	2.66-36	6.41-36	1.63-35	3.43-35	-6.62-34					
10	4.94-27	5.63-37	8.70-37	1.87-36	4.68-36	1.32-35	4.07-35	-1.29-34						
9	7.05-27	8.24-37	1.36-36	3.25-36	9.72-36	3.63-35	1.15-34							
8	1.06-26	1.29-36	2.33-36	6.67-36	2.74-35	1.83-34								
7	1.72-26	2.21-36	4.65-36	1.86-35	1.61-34									
6	3.12-26	4.39-36	1.24-35	1.10-34										
5	6.76-26	1.15-35	6.76-35											
4	2.07-25	5.72-35												
3	1.59-24													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.32-37	1.49-37	1.62-37	1.67-37	1.60-37	1.32-37	7.34-38	-3.08-38	-2.02-37	-4.69-37	-8.73-37	-1.47-36	-2.35-36	-3.62-36
45	1.41-37	1.40-37	1.22-37	7.55-38	-1.56-38	-1.74-37	-4.34-37	-8.43-37	-1.47-36	-2.43-36	-3.87-36	-6.03-36	-9.24-36	-1.40-35
40	1.69-37	1.37-37	5.67-38	-1.03-37	-3.89-37	-8.75-37	-1.68-36	-2.97-36	-5.03-36	-8.32-36	-1.36-35	-2.20-35	-3.57-35	-5.82-35
35	2.25-37	1.09-37	-1.52-37	-6.63-37	-1.61-36	-3.30-36	-6.29-36	-1.15-35	-2.08-35	-3.75-35	-6.82-35	-1.27-34	-2.43-34	-4.89-34
30	2.63-37	-2.22-37	-1.33-36	-3.69-36	-8.57-36	-1.86-35	-3.97-35	-8.56-35	-1.91-34	-4.56-34	-1.21-33	-3.85-33	-1.71-32	-1.70-31
29	2.37-37	-4.49-37	-2.05-36	-5.55-36	-1.31-35	-2.93-35	-6.56-35	-1.51-34	-3.71-34	-1.01-33	-3.28-33	-1.49-32	-1.53-31	
28	1.72-37	-8.29-37	-3.22-36	-8.64-36	-2.08-35	-4.90-35	-1.17-34	-2.96-34	-8.28-34	-2.77-33	-1.29-32	-1.36-31		
27	3.25-38	-1.49-36	-5.22-36	-1.41-35	-3.53-35	-8.84-35	-2.32-34	-6.69-34	-2.30-33	-1.11-32	-1.21-31			
26	-2.51-37	-2.66-36	-8.83-36	-2.44-35	-6.48-35	-1.77-34	-5.31-34	-1.89-33	-9.38-33	-1.06-31				
25	-8.22-37	-4.87-36	-1.58-35	-4.56-35	-1.32-34	-4.12-34	-1.52-33	-7.85-33	-9.20-32					
24	-1.99-36	-9.30-36	-3.05-35	-9.50-35	-3.12-34	-1.20-33	-6.47-33	-7.92-32						
23	-4.51-36	-1.89-35	-6.55-35	-2.30-34	-9.32-34	-5.24-33	-6.74-32							
22	-1.03-35	-4.25-35	-1.63-34	-7.03-34	-4.17-33	-5.65-32								
21	-2.52-35	-1.10-34	-5.14-34	-3.24-33	-4.66-32									
20	-7.01-35	-3.62-34	-2.45-33	-3.77-32										
19	-2.43-34	-1.80-33	-2.98-32											
18	-1.27-33	-2.30-32												
17	-1.71-32													

HE + TE = 5.00+04 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 4.288-13 4-3 RC = 6.126-14 4-3 EM = 2.596-25 2S RC = 1.430-13 2P RC = 2.858-13

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.47-03	4.77-04	2.22-04	1.23-04	7.55-05	4.99-05	3.48-05	2.52-05	1.89-05	1.45-05	1.14-05	9.08-06	7.37-06	6.09-06
45	1.94-03	6.36-04	2.99-04	1.67-04	1.04-04	6.87-05	4.80-05	3.48-05	2.61-05	2.01-05	1.58-05	1.26-05	1.02-05	8.41-06
40	2.68-03	8.90-04	4.23-04	2.38-04	1.48-04	9.82-05	6.87-05	4.99-05	3.74-05	2.88-05	2.26-05	1.81-05	1.47-05	1.21-05
35	3.92-03	1.32-03	6.29-04	3.55-04	2.21-04	1.47-04	1.03-04	7.49-05	5.62-05	4.32-05	3.39-05	2.71-05	2.20-05	1.81-05
30	6.16-03	2.08-03	9.97-04	5.63-04	3.51-04	2.34-04	1.64-04	1.19-04	8.94-05	6.88-05	5.40-05	4.32-05	3.50-05	2.88-05
29	6.82-03	2.30-03	1.10-03	6.23-04	3.89-04	2.59-04	1.81-04	1.32-04	9.91-05	7.62-05	5.98-05	4.78-05	3.88-05	3.19-05
28	7.56-03	2.55-03	1.23-03	6.93-04	4.32-04	2.88-04	2.02-04	1.47-04	1.10-04	8.47-05	6.65-05	5.31-05	4.31-05	3.54-05
27	8.43-03	2.85-03	1.37-03	7.72-04	4.82-04	3.21-04	2.25-04	1.64-04	1.23-04	9.45-05	7.42-05	5.93-05	4.81-05	3.95-05
26	9.43-03	3.19-03	1.53-03	8.65-04	5.39-04	3.60-04	2.52-04	1.83-04	1.38-04	1.06-04	8.31-05	6.64-05	5.38-05	4.42-05
25	1.06-02	3.58-03	1.72-03	9.73-04	6.07-04	4.05-04	2.84-04	2.07-04	1.55-04	1.19-04	9.36-05	7.47-05	6.06-05	4.97-05
24	1.20-02	4.05-03	1.94-03	1.10-03	6.86-04	4.58-04	3.21-04	2.34-04	1.75-04	1.35-04	1.06-04	8.45-05	6.84-05	5.61-05
23	1.36-02	4.60-03	2.21-03	1.25-03	7.80-04	5.20-04	3.65-04	2.66-04	1.99-04	1.53-04	1.20-04	9.60-05	7.77-05	6.37-05
22	1.55-02	5.25-03	2.52-03	1.43-03	8.91-04	5.95-04	4.17-04	3.04-04	2.28-04	1.75-04	1.37-04	1.10-04	8.88-05	7.27-05
21	1.78-02	6.03-03	2.90-03	1.64-03	1.03-03	6.84-04	4.80-04	3.49-04	2.62-04	2.02-04	1.58-04	1.26-04	1.02-04	8.33-05
20	2.07-02	6.98-03	3.36-03	1.90-03	1.19-03	7.93-04	5.56-04	4.05-04	3.04-04	2.33-04	1.83-04	1.46-04	1.18-04	9.60-05
19	2.41-02	8.14-03	3.92-03	2.22-03	1.39-03	9.26-04	6.49-04	4.73-04	3.55-04	2.72-04	2.13-04	1.70-04	1.37-04	1.11-04
18	2.83-02	9.57-03	4.61-03	2.61-03	1.63-03	1.09-03	7.65-04	5.57-04	4.18-04	3.21-04	2.51-04	1.99-04	1.60-04	1.28-04
17	3.36-02	1.14-02	5.47-03	3.10-03	1.94-03	1.30-03	9.09-04	6.62-04	4.96-04	3.81-04	2.97-04	2.35-04	1.87-04	1.47-04
16	4.03-02	1.36-02	6.56-03	3.72-03	2.33-03	1.56-03	1.09-03	7.95-04	5.96-04	4.56-04	3.55-04	2.78-04	2.17-04	1.59-04
15	4.90-02	1.65-02	7.97-03	4.53-03	2.83-03	1.89-03	1.33-03	9.67-04	7.23-04	5.51-04	4.26-04	3.27-04	2.37-04	
14	6.03-02	2.04-02	9.82-03	5.58-03	3.49-03	2.34-03	1.64-03	1.19-03	8.88-04	6.72-04	5.09-04	3.65-04		
13	7.54-02	2.54-02	1.23-02	6.98-03	4.38-03	2.93-03	2.05-03	1.49-03	1.10-03	8.19-04	5.79-04			
12	9.60-02	3.24-02	1.57-02	8.91-03	5.59-03	3.74-03	2.61-03	1.88-03	1.37-03	9.53-04				
11	1.25-01	4.22-02	2.04-02	1.16-02	7.29-03	4.87-03	3.39-03	2.41-03	1.64-03					
10	1.67-01	5.63-02	2.73-02	1.56-02	9.76-03	6.50-03	4.47-03	2.97-03						
9	2.30-01	7.77-02	3.77-02	2.15-02	1.35-02	8.88-03	5.74-03							
8	3.31-01	1.12-01	5.43-02	3.10-02	1.92-02	1.20-02								
7	5.01-01	1.69-01	8.23-02	4.68-02	2.77-02									
6	8.15-01	2.74-01	1.33-01	7.29-02										
5	1.47+00	4.91-01	2.32-01											
4	3.13+00	1.00+00												
3	8.82+00													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.04-06	4.24-06	3.60-06	3.08-06	2.66-06	2.30-06	2.01-06	1.77-06	1.56-06	1.38-06	1.23-06	1.10-06	9.90-07	8.91-07
45	7.00-06	5.88-06	4.99-06	4.27-06	3.68-06	3.19-06	2.79-06	2.45-06	2.16-06	1.91-06	1.70-06	1.52-06	1.36-06	1.23-06
40	1.00-05	8.44-06	7.16-06	6.12-06	5.27-06	4.57-06	3.99-06	3.50-06	3.08-06	2.73-06	2.43-06	2.16-06	1.94-06	1.74-06
35	1.50-05	1.26-05	1.07-05	9.16-06	7.88-06	6.83-06	5.95-06	5.21-06	4.58-06	4.05-06	3.58-06	3.19-06	2.84-06	2.53-06
30	2.39-05	2.01-05	1.70-05	1.45-05	1.25-05	1.08-05	9.35-06	8.15-06	7.12-06	6.23-06	5.45-06	4.74-06	4.06-06	3.26-06
29	2.65-05	2.22-05	1.88-05	1.60-05	1.38-05	1.19-05	1.03-05	8.96-06	7.80-06	6.80-06	5.89-06	5.02-06	4.01-06	
28	2.94-05	2.47-05	2.09-05	1.78-05	1.52-05	1.31-05	1.14-05	9.85-06	8.54-06	7.37-06	6.25-06	4.98-06		
27	3.28-05	2.75-05	2.32-05	1.98-05	1.69-05	1.46-05	1.26-05	1.08-05	9.30-06	7.86-06	6.23-06			
26	3.67-05	3.07-05	2.60-05	2.21-05	1.89-05	1.62-05	1.39-05	1.18-05	9.96-06	7.87-06				
25	4.12-05	3.45-05	2.91-05	2.47-05	2.10-05	1.79-05	1.52-05	1.28-05	1.00-05					
24	4.65-05	3.89-05	3.28-05	2.77-05	2.35-05	1.98-05	1.65-05	1.29-05						
23	5.28-05	4.40-05	3.69-05	3.11-05	2.61-05	2.16-05	1.68-05							
22	6.01-05	5.00-05	4.17-05	3.48-05	2.86-05	2.21-05								
21	6.86-05	5.68-05	4.70-05	3.84-05	2.94-05									
20	7.87-05	6.46-05	5.23-05	3.98-05										
19	9.02-05	7.24-05	5.47-05											
18	1.02-04	7.65-05												
17	1.09-04													

HE + TE = 5.00+04 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU	NL 2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.61-30	3.64-39	4.44-39	6.51-39	1.00-38	1.56-38	2.42-38	3.75-38	5.73-38	8.62-38	1.27-37	1.85-37	2.65-37	3.73-37
45	4.96-30	4.95-39	6.12-39	9.13-39	1.41-38	2.16-38	3.26-38	4.84-38	7.06-38	1.01-37	1.43-37	1.99-37	2.72-37	3.69-37
40	7.08-30	6.98-39	8.65-39	1.30-38	2.00-38	3.03-38	4.47-38	6.44-38	9.05-38	1.24-37	1.68-37	2.23-37	2.91-37	3.74-37
35	1.06-29	1.04-38	1.28-38	1.93-38	2.98-38	4.50-38	6.59-38	9.35-38	1.29-37	1.73-37	2.25-37	2.86-37	3.54-37	4.23-37
30	1.69-29	1.65-38	2.05-38	3.12-38	4.85-38	7.30-38	1.09-37	1.55-37	2.14-37	2.86-37	3.70-37	4.59-37	5.40-37	5.84-37
29	1.88-29	1.83-38	2.28-38	3.47-38	5.41-38	8.27-38	1.22-37	1.75-37	2.43-37	3.25-37	4.20-37	5.20-37	6.06-37	6.38-37
28	2.09-29	2.03-38	2.54-38	3.88-38	6.08-38	9.33-38	1.39-37	1.99-37	2.77-37	3.72-37	4.82-37	5.95-37	6.87-37	7.00-37
27	2.33-29	2.27-38	2.84-38	4.36-38	6.86-38	1.06-37	1.58-37	2.28-37	3.19-37	4.31-37	5.59-37	6.90-37	7.86-37	7.67-37
26	2.62-29	2.55-38	3.20-38	4.92-38	7.79-38	1.21-37	1.82-37	2.64-37	3.71-37	5.04-37	6.56-37	8.09-37	9.08-37	8.31-37
25	2.95-29	2.88-38	3.62-38	5.60-38	8.90-38	1.39-37	2.10-37	3.08-37	4.36-37	5.96-37	7.80-37	9.59-37	1.06-36	8.76-37
24	3.34-29	3.26-38	4.12-38	6.40-38	1.02-37	1.61-37	2.46-37	3.63-37	5.19-37	7.14-37	9.40-37	1.15-36	1.23-36	8.56-37
23	3.80-29	3.72-38	4.71-38	7.37-38	1.19-37	1.88-37	2.90-37	4.33-37	6.24-37	8.68-37	1.15-36	1.40-36	1.42-36	6.62-37
22	4.36-29	4.27-38	5.43-38	8.55-38	1.39-37	2.22-37	3.46-37	5.23-37	7.63-37	1.07-36	1.43-36	1.72-36	1.60-36	1.22-38
21	5.03-29	4.94-38	6.31-38	1.00-37	1.64-37	2.66-37	4.19-37	6.40-37	9.48-37	1.35-36	1.80-36	2.13-36	1.65-36	-1.87-36
20	5.84-29	5.75-38	7.39-38	1.18-37	1.96-37	3.21-37	5.14-37	7.98-37	1.20-36	1.73-36	2.32-36	2.61-36	1.18-36	-7.43-36
19	6.84-29	6.76-38	8.74-38	1.41-37	2.37-37	3.95-37	6.42-37	1.02-36	1.56-36	2.28-36	3.05-36	3.07-36	-1.13-36	-2.56-35
18	8.09-29	8.01-38	1.04-37	1.71-37	2.91-37	4.93-37	8.18-37	1.32-36	2.08-36	3.09-36	4.04-36	2.95-36	-1.06-35	-9.93-35
17	9.66-29	9.61-38	1.26-37	2.09-37	3.63-37	6.28-37	1.07-36	1.78-36	2.86-36	4.32-36	5.27-36	-3.93-37	-5.43-35	-5.45-34
16	1.17-28	1.17-37	1.55-37	2.61-37	4.63-37	8.21-37	1.44-36	2.48-36	4.12-36	6.24-36	5.89-36	-2.23-35	-3.44-34	-7.39-33
15	1.43-28	1.44-37	1.93-37	3.32-37	6.04-37	1.11-36	2.02-36	3.62-36	6.25-36	9.10-36	-1.15-36	-1.94-34	-5.15-33	
14	1.78-28	1.80-37	2.46-37	4.33-37	8.13-37	1.55-36	2.97-36	5.63-36	1.01-35	1.13-35	-8.76-35	-3.37-33		
13	2.25-28	2.29-37	3.20-37	5.81-37	1.14-36	2.29-36	4.69-36	9.55-36	1.70-35	-1.83-35	-2.01-33			
12	2.91-28	3.00-37	4.29-37	8.10-37	1.68-36	3.64-36	8.15-36	1.82-35	2.15-35	-1.03-33				
11	3.86-28	4.03-37	5.96-37	1.19-36	2.66-36	6.39-36	1.64-35	3.92-35	-3.91-34					
10	5.29-28	5.63-37	8.69-37	1.87-36	4.67-36	1.32-35	4.21-35	-1.95-35						
9	7.56-28	8.24-37	1.35-36	3.25-36	9.69-36	3.65-35	1.51-34							
8	1.14-27	1.29-36	2.32-36	6.65-36	2.74-35	1.91-34								
7	1.85-27	2.21-36	4.65-36	1.85-35	1.62-34									
6	3.34-27	4.39-36	1.24-35	1.10-34										
5	7.25-27	1.15-35	6.74-35											
4	2.22-26	5.72-35												
3	1.71-25													

NU	NL 16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.18-37	7.10-37	9.63-37	1.29-36	1.72-36	2.27-36	2.98-36	3.90-36	5.06-36	6.56-36	8.48-36	1.09-35	1.41-35	1.81-35
45	4.96-37	6.59-37	8.69-37	1.14-36	1.48-36	1.91-36	2.47-36	3.17-36	4.06-36	5.18-36	6.62-36	8.44-36	1.08-35	1.37-35
40	4.74-37	5.93-37	7.32-37	8.89-37	1.06-36	1.24-36	1.41-36	1.54-36	1.57-36	1.41-36	8.94-37	-2.37-37	-2.67-36	-7.22-36
35	4.85-37	5.22-37	5.06-37	3.84-37	6.86-38	-5.93-37	-1.87-36	-4.22-36	-8.52-36	-1.64-35	-3.09-35	-5.86-35	-1.13-34	-2.29-34
30	5.38-37	2.94-37	-3.52-37	-1.80-36	-4.83-36	-1.11-35	-2.39-35	-5.14-35	-1.13-34	-2.63-34	-6.76-34	-2.08-33	-8.95-33	-8.83-32
29	5.38-37	1.47-37	-8.50-37	-3.09-36	-7.91-36	-1.82-35	-4.07-35	-9.22-35	-2.20-34	-5.78-34	-1.81-33	-7.95-33	-7.99-32	
28	5.17-37	-1.02-37	-1.66-36	-5.24-36	-1.32-35	-3.12-35	-7.34-35	-1.80-34	-4.87-34	-1.56-33	-6.99-33	-7.18-32		
27	4.53-37	-5.38-37	-3.05-36	-8.99-36	-2.30-35	-5.68-35	-1.45-34	-4.03-34	-1.32-33	-6.07-33	-6.39-32			
26	2.99-37	-1.33-36	-5.54-36	-1.60-35	-4.25-35	-1.13-34	-3.27-34	-1.11-33	-5.22-33	-5.64-32				
25	-4.26-38	-2.83-36	-1.03-35	-3.03-35	-8.61-35	-2.59-34	-9.10-34	-4.43-33	-4.94-32					
24	-7.86-37	-5.85-36	-2.04-35	-6.29-35	-2.00-34	-7.34-34	-3.70-33	-4.27-32						
23	-2.44-36	-1.24-35	-4.38-35	-1.50-34	-5.79-34	-3.05-33	-3.66-32							
22	-6.33-36	-2.84-35	-1.08-34	-4.44-34	-2.46-33	-3.09-32								
21	-1.64-35	-7.35-35	-3.30-34	-1.95-33	-2.58-32									
20	-4.63-35	-2.36-34	-1.50-33	-2.11-32										
19	-1.59-34	-1.12-33	-1.69-32											
18	-8.02-34	-1.33-32												
17	-1.01-32													

HE + TE = 5.00+04 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 4.289-13 4-3 RC = 6.109-14 4-3 EM = 2.589-25 2S RC = 1.431-13 2P RC = 2.858-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.75-03	5.52-04	2.45-04	1.30-04	7.79-05	5.04-05	3.45-05	2.47-05	1.83-05	1.39-05	1.08-05	8.61-06	6.95-06	5.70-06
45	2.25-03	7.17-04	3.23-04	1.74-04	1.05-04	6.84-05	4.71-05	3.39-05	2.52-05	1.93-05	1.50-05	1.20-05	9.70-06	7.96-06
40	3.00-03	9.66-04	4.43-04	2.42-04	1.48-04	9.71-05	6.73-05	4.87-05	3.63-05	2.78-05	2.18-05	1.74-05	1.41-05	1.16-05
35	4.22-03	1.38-03	6.42-04	3.57-04	2.20-04	1.45-04	1.01-04	7.35-05	5.50-05	4.23-05	3.31-05	2.65-05	2.15-05	1.76-05
30	6.41-03	2.12-03	1.00-03	5.64-04	3.50-04	2.33-04	1.63-04	1.18-04	8.85-05	6.80-05	5.33-05	4.26-05	3.45-05	2.83-05
29	7.04-03	2.34-03	1.11-03	6.24-04	3.88-04	2.58-04	1.80-04	1.31-04	9.82-05	7.54-05	5.92-05	4.72-05	3.83-05	3.14-05
28	7.78-03	2.59-03	1.23-03	6.93-04	4.31-04	2.87-04	2.01-04	1.46-04	1.09-04	8.39-05	6.59-05	5.26-05	4.26-05	3.50-05
27	8.62-03	2.88-03	1.37-03	7.73-04	4.81-04	3.20-04	2.24-04	1.63-04	1.22-04	9.38-05	7.36-05	5.87-05	4.76-05	3.90-05
26	9.61-03	3.22-03	1.54-03	8.66-04	5.39-04	3.59-04	2.51-04	1.83-04	1.37-04	1.05-04	8.25-05	6.58-05	5.33-05	4.37-05
25	1.08-02	3.61-03	1.73-03	9.74-04	6.07-04	4.04-04	2.83-04	2.06-04	1.54-04	1.18-04	9.29-05	7.41-05	6.00-05	4.92-05
24	1.21-02	4.07-03	1.95-03	1.10-03	6.86-04	4.57-04	3.20-04	2.33-04	1.74-04	1.34-04	1.05-04	8.38-05	6.78-05	5.56-05
23	1.37-02	4.62-03	2.22-03	1.25-03	7.80-04	5.20-04	3.64-04	2.65-04	1.98-04	1.52-04	1.19-04	9.52-05	7.70-05	6.31-05
22	1.57-02	5.28-03	2.53-03	1.43-03	8.92-04	5.95-04	4.16-04	3.03-04	2.27-04	1.74-04	1.37-04	1.09-04	8.80-05	7.19-05
21	1.80-02	6.06-03	2.91-03	1.65-03	1.03-03	6.84-04	4.79-04	3.49-04	2.61-04	2.01-04	1.57-04	1.25-04	1.01-04	8.24-05
20	2.08-02	7.01-03	3.37-03	1.91-03	1.19-03	7.93-04	5.55-04	4.04-04	3.03-04	2.32-04	1.82-04	1.45-04	1.17-04	9.49-05
19	2.42-02	8.17-03	3.93-03	2.22-03	1.39-03	9.26-04	6.49-04	4.72-04	3.53-04	2.71-04	2.12-04	1.68-04	1.35-04	1.10-04
18	2.85-02	9.61-03	4.62-03	2.62-03	1.63-03	1.09-03	7.64-04	5.55-04	4.16-04	3 19-04	2.49-04	1.97-04	1.58-04	1.27-04
17	3.38-02	1.14-02	5.49-03	3.11-03	1.94-03	1.30-03	9.08-04	6.60-04	4.94-04	3.78-04	2.95-04	2.32-04	1.84-04	1.45-04
16	4.05-02	1.37-02	6.58-03	3.73-03	2.33-03	1.56-03	1.09-03	7.93-04	5.93-04	4.53-04	3.51-04	2.75-04	2.14-04	1.57-04
15	4.92-02	1.66-02	8.00-03	4.53-03	2.84-03	1.89-03	1.33-03	9.63-04	7.19-04	5.47-04	4.21-04	3.23-04	2.35-04	
14	6.05-02	2.04-02	9.84-03	5.59-03	3.50-03	2.33-03	1.64-03	1.19-03	8.82-04	6.66-04	5.03-04	3.61-04		
13	7.56-02	2.55-02	1.23-02	7.00-03	4.38-03	2.92-03	2.05-03	1.48-03	1.09-03	8.11-04	5.72-04			
12	9.63-02	3.25-02	1.57-02	8.92-03	5.59-03	3.73-03	2.61-03	1.87-03	1.36-03	9.43-04				
11	1.25-01	4.23-02	2.04-02	1.16-02	7.29-03	4.86-03	3.38-03	2.39-03	1.62-03					
10	1.67-01	5.65-02	2.73-02	1.56-02	9.76-03	6.48-03	4.44-03	2.94-03						
9	2.31-01	7.79-02	3.78-02	2.16-02	1.35-02	8.84-03	5.69-03							
8	3.32-01	1.12-01	5.44-02	3.10-02	1.92-02	1.19-02								
7	5.03-01	1.69-01	8.24-02	4.67-02	2.75-02									
6	8.18-01	2.75-01	1.34-01	7.26-02										
5	1.48+00	4.92-01	2.31-01											
4	3.14+00	1.00+00												
3	8.84+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.73-06	3.96-06	3.36-06	2.87-06	2.47-06	2.14-06	1.87-06	1.64-06	1.45-06	1.28-06	1.14-06	1.02-06	9.19-07	8.28-07
45	6.61-06	5.55-06	4.71-06	4.03-06	3.47-06	3.01-06	2.63-06	2.31-06	2.04-06	1.80-06	1.61-06	1.44-06	1.29-06	1.16-06
40	9.63-06	8.09-06	6.86-06	5.87-06	5.06-06	4.38-06	3.83-06	3.36-06	2.96-06	2.62-06	2.33-06	2.08-06	1.87-06	1.68-06
35	1.47-05	1.23-05	1.04-05	8.92-06	7.67-06	6.65-06	5.79-06	5.07-06	4.46-06	3.94-06	3.50-06	3.11-06	2.77-06	2.48-06
30	2.35-05	1.98-05	1.67-05	1.43-05	1.22-05	1.06-05	9.18-06	8.00-06	6.99-06	6.13-06	5.37-06	4.68-06	4.02-06	3.25-06
29	2.61-05	2.19-05	1.85-05	1.58-05	1.35-05	1.17-05	1.01-05	8.80-06	7.67-06	6.69-06	5.81-06	4.97-06	4.00-06	
28	2.90-05	2.43-05	2.06-05	1.75-05	1.50-05	1.29-05	1.12-05	9.70-06	8.41-06	7.27-06	6.19-06	4.97-06		
27	3.24-05	2.71-05	2.29-05	1.95-05	1.67-05	1.43-05	1.24-05	1.07-05	9.18-06	7.78-06	6.21-06			
26	3.63-05	3.03-05	2.56-05	2.17-05	1.86-05	1.59-05	1.37-05	1.17-05	9.86-06	7.83-06				
25	4.08-05	3.41-05	2.87-05	2.43-05	2.07-05	1.77-05	1.50-05	1.26-05	9.97-06					
24	4.60-05	3.84-05	3.23-05	2.73-05	2.31-05	1.96-05	1.63-05	1.28-05						
23	5.21-05	4.35-05	3.64-05	3.06-05	2.57-05	2.13-05	1.67-05							
22	5.93-05	4.93-05	4.12-05	3.43-05	2.82-05	2.19-05								
21	6.78-05	5.61-05	4.64-05	3.79-05	2.92-05									
20	7.77-05	6.37-05	5.16-05	3.95-05										
19	8.90-05	7.15-05	5.42-05											
18	1.01-04	7.58-05												
17	1.08-04													

HE + TE = 5.00+04 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.96-31	3.53-39	3.63-39	4.15-39	5.21-39	8.06-39	1.51-38	3.05-38	6.01-38	1.12-37	1.99-37	3.37-37	5.45-37	8.53-37
45	5.44-31	4.97-39	5.57-39	7.31-39	1.05-38	1.68-38	2.93-38	5.27-38	9.40-38	1.63-37	2.74-37	4.44-37	6.99-37	1.07-36
40	7.76-31	7.18-39	8.58-39	1.23-38	1.88-38	3.01-38	4.97-38	8.27-38	1.37-37	2.22-37	3.53-37	5.50-37	8.39-37	1.26-36
35	1.16-30	1.07-38	1.33-38	1.99-38	3.11-38	4.92-38	7.75-38	1.21-37	1.87-37	2.86-37	4.30-37	6.38-37	9.37-37	1.36-36
30	1.85-30	1.68-38	2.11-38	3.23-38	5.07-38	7.90-38	1.20-37	1.80-37	2.62-37	3 77-37	5.33-37	7.43-37	1.02-36	1.40-36
29	2.06-30	1.86-38	2.34-38	3.58-38	5.63-38	8.75-38	1.33-37	1.97-37	2.86-37	4 06-37	5.66-37	7.78-37	1.05-36	1.40-36
28	2.29-30	2.07-38	2.60-38	3.98-38	6.28-38	9.75-38	1.48-37	2.18-37	3.14-37	4.42-37	6.09-37	8.23-37	1.09-36	1.41-36
27	2.55-30	2.30-38	2.90-38	4.45-38	7.03-38	1.09-37	1.65-37	2.43-37	3.48-37	4.87-37	6.63-37	8.81-37	1.14-36	1.41-36
26	2.87-30	2.58-38	3.25-38	5.01-38	7.92-38	1.23-37	1.87-37	2.74-37	3.92-37	5.44-37	7.33-37	9.57-37	1.19-36	1.39-36
25	3.23-30	2.90-38	3.66-38	5.66-38	8.99-38	1.40-37	2.13-37	3.13-37	4.47-37	6.17-37	8.25-37	1.05-36	1.26-36	1.34-36
24	3.66-30	3.29-38	4.16-38	6.45-38	1.03-37	1.61-37	2.45-37	3.62-37	5.17-37	7.13-37	9.44-37	1.18-36	1.34-36	1.20-36
23	4.17-30	3.74-38	4.75-38	7.40-38	1.19-37	1.87-37	2.86-37	4.25-37	6.08-37	8.39-37	1.10-36	1.35-36	1.41-36	8.71-37
22	4.78-30	4.29-38	5.46-38	8.56-38	1.38-37	2.20-37	3.39-37	5.06-37	7.29-37	1.01-36	1.31-36	1.55-36	1.42-36	7.40-38
21	5.51-30	4.96-38	6.33-38	9.99-38	1.63-37	2.61-37	4.06-37	6.13-37	8.90-37	1.24-36	1.60-36	1.80-36	1.24-36	-1.90-36
20	6.40-30	5.77-38	7.40-38	1.18-37	1.94-37	3.14-37	4.95-37	7.56-37	1.11-36	1.55-36	1.99-36	2.05-36	4.77-37	-7.12-36
19	7.50-30	6.77-38	8.74-38	1.40-37	2.34-37	3.84-37	6.15-37	9.54-37	1.42-36	2.00-36	2.51-36	2.16-36	-2.10-36	-2.28-35
18	8.87-30	8.03-38	1.04-37	1.69-37	2.86-37	4.79-37	7.81-37	1.23-36	1.87-36	2.66-36	3.18-36	1.53-36	-1.11-35	-8.14-35
17	1.06-29	9.62-38	1.26-37	2.08-37	3.57-37	6.09-37	1.02-36	1.65-36	2.55-36	3.63-36	3.86-36	-2.34-36	-4.81-35	-4.04-34
16	1.28-29	1.17-37	1.55-37	2.59-37	4.54-37	7.94-37	1.36-36	2.28-36	3.63-36	5.08-36	3.57-36	-2.25-35	-2.69-34	-4.73-33
15	1.57-29	1.44-37	1.93-37	3.29-37	5.92-37	1.07-36	1.90-36	3.30-36	5.40-36	7.02-36	-4.32-36	-1.61-34	-3.47-33	
14	1.95-29	1.80-37	2.45-37	4.28-37	7.96-37	1.49-36	2.79-36	5.09-36	8.49-36	7.39-36	-7.95-35	-2.40-33		
13	2.47-29	2.30-37	3.19-37	5.75-37	1.11-36	2.20-36	4.37-36	8.49-36	1.37-35	-2.22-35	-1.52-33			
12	3.19-29	3.00-37	4.28-37	8.01-37	1.64-36	3.47-36	7.53-36	1.58-35	1.36-35	-8.39-34				
11	4.23-29	4.04-37	5.94-37	1.17-36	2.59-36	6.07-36	1.49-35	3.19-35	-3.52-34					
10	5.80-29	5.63-37	8.66-37	1.84-36	4.53-36	1.24-35	3.71-35	-4.22-35						
9	8.28-29	8.24-37	1.35-36	3.20-36	9.36-36	3.37-35	1.18-34							
8	1.25-28	1.29-36	2.31-36	6.54-36	2.62-35	1.68-34								
7	2.02-28	2.21-36	4.63-36	1.81-35	1.51-34									
6	3.66-28	4.39-36	1.23-35	1.06-34										
5	7.94-28	1.15-35	6.66-35											
4	2.43-27	5.72-35												
3	1.86-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.30-36	1.92-36	2.79-36	3.98-36	5.60-36	7.79-36	1.07-35	1.46-35	1.98-35	2.66-35	3.56-35	4.76-35	6.35-35	8.45-35
45	1.61-36	2.36-36	3.42-36	4.88-36	6.88-36	9.61-36	1.33-35	1.84-35	2.52-35	3.45-35	4.72-35	6.45-35	8.84-35	1.22-34
40	1.86-36	2.71-36	3.90-36	5.56-36	7.88-36	1.11-35	1.56-35	2.19-35	3.07-35	4.32-35	6.11-35	8.69-35	1.25-34	1.82-34
35	1.96-36	2.82-36	4.02-36	5.72-36	8.14-36	1.16-35	1.66-35	2.39-35	3.47-35	5.11-35	7.65-35	1.17-34	1.86-34	3.09-34
30	1.89-36	2.53-36	3.36-36	4.41-36	5.69-36	7.11-36	8.33-36	8.27-36	3.64-36	-1.59-35	-8.64-35	-3.61-34	-1.77-33	-1.66-32
29	1.84-36	2.36-36	2.96-36	3.53-36	3.84-36	3.25-36	1.17-37	-1.01-35	-4.06-35	-1.36-34	-4.82-34	-2.19-33	-2.04-32	
28	1.76-36	2.10-36	2.30-36	2.04-36	9.37-37	-4.11-36	-1.69-35	-5.25-35	-1.59-34	-5.35-34	-2.38-33	-2.23-32		
27	1.63-36	1.68-36	1.19-36	-6.12-37	-5.70-36	-1.92-35	-5.56-35	-1.63-34	-5.42-34	-2.40-33	-2.27-32			
26	1.41-36	9.41-37	-7.77-37	-5.56-36	-1.83-35	-5.28-35	-1.55-34	-5.17-34	-2.31-33	-2.21-32				
25	1.01-36	-3.95-37	-4.51-36	-1.57-35	-4.65-35	-1.39-34	-4.71-34	-2.14-33	-2.09-32					
24	2.24-37	-2.99-36	-1.22-35	-3.84-35	-1.19-34	-4.14-34	-1.92-33	-1.93-32						
23	-1.38-36	-8.44-36	-2.96-35	-9.73-35	-3.51-34	-1.68-33	-1.74-32							
22	-4.91-36	-2.11-35	-7.56-35	-2.88-34	-1.44-33	-1.54-32								
21	-1.35-35	-5.55-35	-2.27-34	-1.19-33	-1.34-32									
20	-3.77-35	-1.72-34	-9.63-34	-1.14-32										
19	-1.23-34	-7.53-34	-9.53-33											
18	-5.66-34	-7.78-33												
17	-6.17-33													

HE + TE = 5.00+04 NE = 1.00+05 CASE B NC = 70

TOTAL RC = 4.292-13 4-3 RC = 6.078-14 4-3 EM = 2.576-25 2S RC = 1.433-13 2P RC = 2.859-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.05-03	6.31-04	2.73-04	1.42-04	8.33-05	5.30-05	3.58-05	2.53-05	1.86-05	1.40-05	1.08-05	8.56-06	6.87-06	5.60-06
45	2.69-03	8.33-04	3.62-04	1.89-04	1.11-04	7.10-05	4.81-05	3.41-05	2.50-05	1.89-05	1.47-05	1.16-05	9.32-06	7.61-06
40	3.61-03	1.13-03	4.94-04	2.61-04	1.54-04	9.91-05	6.74-05	4.80-05	3.54-05	2.68-05	2.08-05	1.65-05	1.33-05	1.09-05
35	4.99-03	1.58-03	7.02-04	3.75-04	2.25-04	1.45-04	9.97-05	7.14-05	5.29-05	4.03-05	3.14-05	2.50-05	2.02-05	1.65-05
30	7.25-03	2.33-03	1.06-03	5.77-04	3.50-04	2.29-04	1.59-04	1.14-04	8.52-05	6.52-05	5.10-05	4.06-05	3.29-05	2.70-05
29	7.69-03	2.54-03	1.16-03	6.35-04	3.87-04	2.54-04	1.76-04	1.27-04	9.47-05	7.25-05	5.67-05	4.52-05	3.66-05	3.00-05
28	8.62-03	2.78-03	1.28-03	7.03-04	4.30-04	2.83-04	1.96-04	1.42-04	1.06-04	8.10-05	6.34-05	5.05-05	4.09-05	3.35-05
27	9.46-03	3.06-03	1.42-03	7.81-04	4.79-04	3.16-04	2.19-04	1.59-04	1.18-04	9.08-05	7.11-05	5.66-05	4.58-05	3.76-05
26	1.04-02	3.39-03	1.58-03	8.72-04	5.36-04	3.54-04	2.46-04	1.78-04	1.33-04	1.02-04	8.00-05	6.37-05	5.15-05	4.22-05
25	1.16-02	3.77-03	1.76-03	9.79-04	6.04-04	3.99-04	2.78-04	2.01-04	1.51-04	1.15-04	9.04-05	7.20-05	5.82-05	4.77-05
24	1.29-02	4.22-03	1.98-03	1.11-03	6.83-04	4.52-04	3.15-04	2.29-04	1.71-04	1.31-04	1.03-04	8.17-05	6.60-05	5.40-05
23	1.45-02	4.76-03	2.24-03	1.25-03	7.77-04	5.15-04	3.60-04	2.61-04	1.95-04	1.49-04	1.17-04	9.31-05	7.52-05	6.15-05
22	1.64-02	5.40-03	2.56-03	1.43-03	8.89-04	5.90-04	4.12-04	2.99-04	2.24-04	1.71-04	1.34-04	1.07-04	8.60-05	7.02-05
21	1.86-02	6.18-03	2.93-03	1.65-03	1.02-03	6.80-04	4.75-04	3.45-04	2.58-04	1.98-04	1.54-04	1.23-04	9.89-05	8.06-05
20	2.14-02	7.12-03	3.39-03	1.91-03	1.19-03	7.89-04	5.52-04	4.00-04	2.99-04	2.29-04	1.79-04	1.42-04	1.14-04	9.28-05
19	2.48-02	8.28-03	3.95-03	2.23-03	1.39-03	9.23-04	6.45-04	4.68-04	3.50-04	2.68-04	2.09-04	1.65-04	1.33-04	1.07-04
18	2.90-02	9.71-03	4.65-03	2.62-03	1.63-03	1.09-03	7.60-04	5.51-04	4.12-04	3.15-04	2.45-04	1.94-04	1.55-04	1.24-04
17	3.43-02	1.15-02	5.52-03	3.12-03	1.94-03	1.29-03	9.04-04	6.56-04	4.89-04	3.74-04	2.90-04	2.28-04	1.81-04	1.42-04
16	4.10-02	1.38-02	6.62-03	3.74-03	2.33-03	1.55-03	1.09-03	7.88-04	5.87-04	4.47-04	3.46-04	2.70-04	2.09-04	1.64-04
15	4.97-02	1.67-02	8.04-03	4.55-03	2.84-03	1.89-03	1.32-03	9.57-04	7.12-04	5.40-04	4.14-04	3.17-04	2.30-04	
14	6.10-02	2.06-02	9.90-03	5.61-03	3.50-03	2.33-03	1.63-03	1.18-03	8.72-04	6.56-04	4.94-04	3.54-04		
13	7.62-02	2.57-02	1.24-02	7.02-03	4.38-03	2.92-03	2.04-03	1.47-03	1.08-03	7.97-04	5.62-04			
12	9.70-02	3.27-02	1.58-02	8.95-03	5.59-03	3.72-03	2.59-03	1.85-03	1.34-03	9.25-04				
11	1.26-01	4.26-02	2.05-02	1.17-02	7.29-03	4.84-03	3.35-03	2.36-03	1.59-03					
10	1.69-01	5.69-02	2.75-02	1.56-02	9.75-03	6.45-03	4.39-03	2.89-03						
9	2.33-01	7.84-02	3.79-02	2.16-02	1.34-02	8.76-03	5.60-03							
8	3.34-01	1.13-01	5.46-02	3.10-02	1.91-02	1.17-02								
7	5.06-01	1.70-01	8.27-02	4.66-02	2.72-02									
6	8.24-01	2.76-01	1.34-01	7.20-02										
5	1.49+00	4.94-01	2.30-01											
4	3.15+00	1.00+00												
3	8.88+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.63-06	3.87-06	3.26-06	2.78-06	2.39-06	2.07-06	1.80-06	1.58-06	1.39-06	1.23-06	1.09-06	9.76-07	8.76-07	7.88-07
45	6.29-06	5.26-06	4.44-06	3.79-06	3.25-06	2.81-06	2.45-06	2.15-06	1.89-06	1.68-06	1.49-06	1.33-06	1.19-06	1.08-06
40	9.00-06	7.53-06	6.37-06	5.43-06	4.67-06	4.05-06	3.53-06	3.09-06	2.72-06	2.41-06	2.14-06	1.92-06	1.72-06	1.54-06
35	1.37-05	1.15-05	9.72-06	8.30-06	7.14-06	6.18-06	5.39-06	4.72-06	4.16-06	3.68-06	3.26-06	2.91-06	2.60-06	2.32-06
30	2.24-05	1.88-05	1.59-05	1.35-05	1.16-05	1.01-05	8.74-06	7.63-06	6.68-06	5.86-06	5.15-06	4.50-06	3.88-06	3.16-06
29	2.49-05	2.09-05	1.77-05	1.51-05	1.29-05	1.12-05	9.68-06	8.44-06	7.37-06	6.44-06	5.61-06	4.81-06	3.90-06	
28	2.78-05	2.33-05	1.97-05	1.68-05	1.44-05	1.24-05	1.07-05	9.33-06	8.11-06	7.03-06	6.01-06	4.85-06		
27	3.12-05	2.61-05	2.20-05	1.88-05	1.61-05	1.38-05	1.19-05	1.03-05	8.89-06	7.56-06	6.07-06			
26	3.50-05	2.93-05	2.47-05	2.10-05	1.79-05	1.54-05	1.32-05	1.13-05	9.60-06	7.67-06				
25	3.95-05	3.30-05	2.78-05	2.36-05	2.01-05	1.72-05	1.46-05	1.23-05	9.77-06					
24	4.47-05	3.73-05	3.14-05	2.65-05	2.25-05	1.90-05	1.59-05	1.26-05						
23	5.08-05	4.23-05	3.55-05	2.98-05	2.51-05	2.08-05	1.63-05							
22	5.79-05	4.81-05	4.01-05	3.35-05	2.76-05	2.15-05								
21	6.62-05	5.47-05	4.53-05	3.71-05	2.87-05									
20	7.59-05	6.22-05	5.05-05	3.88-05										
19	8.70-05	7.00-05	5.32-05											
18	9.87-05	7.44-05												
17	1.06-04													

HE + TE = 5.00+04 NE = 1.00+05 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.04-32	3.24-39	2.42-39	7.24-40	-2.39-39	-6.33-39	-9.17-39	-7.17-39	5.76-39	3.87-38	1.05-37	2.22-37	4.14-37	7.13-37
45	6.93-32	4.59-39	3.87-39	2.56-39	3.36-40	-1.41-39	7.82-40	1.32-38	4.57-38	1.13-37	2.38-37	4.49-37	7.88-37	1.31-36
40	9.88-32	6.77-39	6.46-39	6.26-39	6.25-39	9.00-39	2.01-38	4.92-38	1.12-37	2.31-37	4.41-37	7.91-37	1.35-36	2.21-36
35	1.48-31	1.05-38	1.14-38	1.40-38	1.94-38	3.17-38	5.94-38	1.17-37	2.27-37	4.23-37	7.58-37	1.31-36	2.18-36	3.54-36
30	2.36-31	1.73-38	2.06-38	2.94-38	4.56-38	7.56-38	1.31-37	2.31-37	4.07-37	7.04-37	1.20-36	1.99-36	3.27-36	5.30-36
29	2.62-31	1.92-38	2.32-38	3.38-38	5.36-38	8.78-38	1.50-37	2.61-37	4.51-37	7.70-37	1.30-36	2.15-36	3.51-36	5.68-36
28	2.91-31	2.14-38	2.62-38	3.87-38	6.14-38	1.01-37	1.72-37	2.93-37	4.98-37	8.38-37	1.40-36	2.30-36	3.74-36	6.06-36
27	3.25-31	2.39-38	2.96-38	4.44-38	7.08-38	1.17-37	1.95-37	3.27-37	5.48-37	9.10-37	1.50-36	2.45-36	3.97-36	6.44-36
26	3.65-31	2.67-38	3.34-38	5.08-38	8.15-38	1.34-37	2.21-37	3.66-37	6.02-37	9.85-37	1.60-36	2.60-36	4.21-36	6.82-36
25	4.11-31	3.01-38	3.79-38	5.81-38	9.37-38	1.53-37	2.50-37	4.08-37	6.62-37	1.07-36	1.72-36	2.76-36	4.43-36	7.18-36
24	4.66-31	3.39-38	4.31-38	6.66-38	1.08-37	1.75-37	2.84-37	4.57-37	7.30-37	1.16-36	1.84-36	2.92-36	4.66-36	7.50-36
23	5.31-31	3.85-38	4.91-38	7.65-38	1.24-37	2.01-37	3.24-37	5.15-37	8.11-37	1.27-36	1.98-36	3.09-36	4.86-36	7.72-36
22	6.08-31	4.40-38	5.63-38	8.83-38	1.44-37	2.33-37	3.72-37	5.86-37	9.10-37	1.40-36	2.15-36	3.28-36	5.02-36	7.68-36
21	7.01-31	5.06-38	6.50-38	1.02-37	1.67-37	2.71-37	4.33-37	6.76-37	1.04-36	1.58-36	2.36-36	3.48-36	5.03-36	6.95-36
20	8.15-31	5.86-38	7.56-38	1.20-37	1.97-37	3.21-37	5.11-37	7.96-37	1.21-36	1.81-36	2.62-36	3.64-36	4.59-36	4.15-36
19	9.55-31	6.86-38	8.88-38	1.42-37	2.35-37	3.85-37	6.16-37	9.61-37	1.46-36	2.13-36	2.95-36	3.62-36	2.77-36	-5.49-36
18	1.13-30	8.11-38	1.06-37	1.70-37	2.85-37	4.71-37	7.61-37	1.19-36	1.81-36	2.59-36	3.33-36	2.88-36	-3.85-36	-4.29-35
17	1.35-30	9.69-38	1.27-37	2.07-37	3.52-37	5.91-37	9.68-37	1.54-36	2.33-36	3.25-36	3.53-36	-7.26-37	-3.07-35	-2.44-34
16	1.63-30	1.17-37	1.55-37	2.57-37	4.44-37	7.61-37	1.27-36	2.06-36	3.14-36	4.15-36	2.50-36	-1.76-35	-1.82-34	-2.70-33
15	1.99-30	1.44-37	1.93-37	3.25-37	5.75-37	1.01-36	1.75-36	2.90-36	4.45-36	5.05-36	-5.74-36	-1.22-34	-2.14-33	
14	2.48-30	1.80-37	2.45-37	4.22-37	7.69-37	1.40-36	2.52-36	4.34-36	6.56-36	3.43-36	-6.89-35	-1.59-33		
13	3.14-30	2.30-37	3.18-37	5.65-37	1.07-36	2.05-36	3.89-36	7.00-36	9.43-36	-2.66-35	-1.10-33			
12	4.06-30	3.00-37	4.26-37	7.86-37	1.57-36	3.21-36	6.57-36	1.23-35	3.67-36	-6.67-34				
11	5.38-30	4.04-37	5.91-37	1.15-36	2.47-36	5.55-36	1.26-35	2.19-35	-3.24-34					
10	7.38-30	5.64-37	8.61-37	1.80-36	4.29-36	1.12-35	2.96-35	-7.80-35						
9	1.05-29	8.25-37	1.34-36	3.12-36	8.78-36	2.93-35	7.09-35							
8	1.58-29	1.29-36	2.30-36	6.38-36	2.41-35	1.34-34								
7	2.57-29	2.21-36	4.58-36	1.74-35	1.33-34									
6	4.64-29	4.39-36	1.22-35	1.00-34										
5	1.00-28	1.15-35	6.52-35											
4	3.07-28	5.71-35												
3	2.33-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.16-36	1.81-36	2.73-36	4.01-36	5.76-36	8.12-36	1.13-35	1.54-35	2.09-35	2.80-35	3.71-35	4.88-35	6.38-35	8.27-35
45	2.10-36	3.24-36	4.88-36	7.20-36	1.04-35	1.49-35	2.10-35	2.94-35	4.08-35	5.62-35	7.71-35	1.05-34	1.44-34	1.96-34
40	3.51-36	5.44-36	8.25-36	1.23-35	1.82-35	2.66-35	3.85-35	5.56-35	8.00-35	1.15-34	1.66-34	2.41-34	3.53-34	5.21-34
35	5.62-36	8.79-36	1.35-35	2.07-35	3.14-35	4.77-35	7.23-35	1.10-34	1.70-34	2.65-34	4.21-34	6.88-34	1.17-33	2.08-33
30	8.50-36	1.36-35	2.16-35	3.45-35	5.55-35	9.07-35	1.52-34	2.62-34	4.73-34	9.17-34	1.98-33	5.06-33	1.78-32	1.39-31
29	9.15-36	1.47-35	2.36-35	3.83-35	6.28-35	1.05-34	1.82-34	3.29-34	6.37-34	1.37-33	3.48-33	1.22-32	9.40-32	
28	9.80-36	1.59-35	2.58-35	4.25-35	7.15-35	1.24-34	2.23-34	4.30-34	9.17-34	2.31-33	6.01-33	6.11-32		
27	1.05-35	1.71-35	2.82-35	4.74-35	8.18-35	1.47-34	2.82-34	5.96-34	1.48-33	5.03-33	3.77-32			
26	1.11-35	1.83-35	3.07-35	5.28-35	9.45-35	1.79-34	3.73-34	9.07-34	2.99-33	2.17-32				
25	1.17-35	1.95-35	3.33-35	5.87-35	1.09-34	2.22-34	5.21-34	1.63-33	1.11-32					
24	1.23-35	2.05-35	3.53-35	6.36-35	1.23-34	2.69-34	7.53-34	4.36-33						
23	1.24-35	2.05-35	3.47-35	6.10-35	1.12-34	2.08-34	1.64-34							
22	1.18-35	1.77-35	2.45-35	2.01-35	-1.07-34	-2.25-33								
21	8.44-36	5.00-36	-2.81-35	-2.70-34	-3.49-33									
20	-3.57-36	-4.81-35	-3.34-34	-3.99-33										
19	-5.05-35	-3.35-34	-3.99-33											
18	-2.99-34	-3.70-33												
17	-3.25-33													

HE + TE = 5.00+04 NE = 1.00+06 CASE B NC = 70

TOTAL RC = 4.298-13 4-3 RC = 6.030-14 4-3 EM = 2.555-25 2S RC = 1.437-13 2P RC = 2.862-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.37-03	7.28-04	3.13-04	1.62-04	9.48-05	6.01-05	4.05-05	2.85-05	2.09-05	1.57-05	1.21-05	9.57-06	7.67-06	6.25-06
45	3.08-03	9.46-04	4.07-04	2.11-04	1.23-04	7.80-05	5.27-05	3.72-05	2.72-05	2.05-05	1.58-05	1.25-05	1.00-05	8.15-06
40	4.14-03	1.27-03	5.49-04	2.85-04	1.67-04	1.06-04	7.14-05	5.04-05	3.69-05	2.78-05	2.15-05	1.70-05	1.36-05	1.11-05
35	5.85-03	1.80-03	7.81-04	4.07-04	2.39-04	1.52-04	1.03-04	7.26-05	5.32-05	4.02-05	3.11-05	2.45-05	1.97-05	1.61-05
30	8.68-03	2.70-03	1.18-03	6.19-04	3.66-04	2.34-04	1.59-04	1.13-04	8.31-05	6.29-05	4.88-05	3.86-05	3.10-05	2.53-05
29	9.45-03	2.95-03	1.29-03	6.80-04	4.02-04	2.58-04	1.75-04	1.25-04	9.18-05	6.96-05	5.40-05	4.27-05	3.44-05	2.81-05
28	1.03-02	3.22-03	1.42-03	7.48-04	4.44-04	2.85-04	1.94-04	1.38-04	1.02-04	7.73-05	6.01-05	4.76-05	3.83-05	3.13-05
27	1.13-02	3.53-03	1.56-03	8.26-04	4.91-04	3.16-04	2.16-04	1.54-04	1.14-04	8.64-05	6.71-05	5.32-05	4.28-05	3.50-05
26	1.23-02	3.89-03	1.72-03	9.16-04	5.47-04	3.53-04	2.41-04	1.72-04	1.27-04	9.69-05	7.54-05	5.98-05	4.82-05	3.94-05
25	1.36-02	4.29-03	1.91-03	1.02-03	6.11-04	3.96-04	2.71-04	1.94-04	1.44-04	1.09-04	8.52-05	6.76-05	5.45-05	4.45-05
24	1.50-02	4.76-03	2.13-03	1.14-03	6.88-04	4.47-04	3.07-04	2.20-04	1.63-04	1.24-04	9.68-05	7.68-05	6.19-05	5.06-05
23	1.67-02	5.30-03	2.39-03	1.29-03	7.78-04	5.07-04	3.49-04	2.51-04	1.86-04	1.42-04	1.11-04	8.78-05	7.08-05	5.79-05
22	1.86-02	5.94-03	2.69-03	1.46-03	8.87-04	5.79-04	4.00-04	2.88-04	2.14-04	1.63-04	1.27-04	1.01-04	8.14-05	6.64-05
21	2.09-02	6.71-03	3.06-03	1.67-03	1.02-03	6.67-04	4.61-04	3.32-04	2.47-04	1.89-04	1.47-04	1.17-04	9.41-05	7.67-05
20	2.37-02	7.63-03	3.51-03	1.93-03	1.18-03	7.74-04	5.36-04	3.87-04	2.88-04	2.20-04	1.71-04	1.36-04	1.09-04	8.88-05
19	2.71-02	8.76-03	4.06-03	2.24-03	1.37-03	9.06-04	6.29-04	4.54-04	3.38-04	2.58-04	2.01-04	1.59-04	1.28-04	1.03-04
18	3.12-02	1.02-02	4.74-03	2.63-03	1.62-03	1.07-03	7.43-04	5.37-04	4.00-04	3.05-04	2.37-04	1.87-04	1.49-04	1.20-04
17	3.64-02	1.19-02	5.60-03	3.12-03	1.93-03	1.28-03	8.87-04	6.41-04	4.77-04	3.63-04	2.82-04	2.21-04	1.75-04	1.38-04
16	4.30-02	1.42-02	6.70-03	3.75-03	2.32-03	1.54-03	1.07-03	7.72-04	5.74-04	4.36-04	3.36-04	2.62-04	2.04-04	1.50-04
15	5.16-02	1.71-02	8.11-03	4.56-03	2.83-03	1.87-03	1.30-03	9.40-04	6.97-04	5.27-04	4.03-04	3.08-04	2.25-04	
14	6.28-02	2.09-02	9.98-03	5.62-03	3.49-03	2.31-03	1.61-03	1.16-03	8.55-04	6.41-04	4.81-04	3.45-04		
13	7.79-02	2.61-02	1.25-02	7.04-03	4.37-03	2.90-03	2.01-03	1.44-03	1.06-03	7.78-04	5.48-04			
12	9.87-02	3.31-02	1.59-02	8.97-03	5.58-03	3.70-03	2.56-03	1.82-03	1.31-03	9.03-04				
11	1.28-01	4.30-02	2.07-02	1.17-02	7.27-03	4.81-03	3.30-03	2.31-03	1.56-03					
10	1.71-01	5.74-02	2.77-02	1.57-02	9.72-03	6.39-03	4.32-03	2.83-03						
9	2.35-01	7.92-02	3.82-02	2.16-02	1.34-02	8.65-03	5.49-03							
8	3.38-01	1.14-01	5.49-02	3.10-02	1.89-02	1.15-02								
7	5.12-01	1.72-01	8.30-02	4.64-02	2.68-02									
6	8.33-01	2.79-01	1.34-01	7.12-02										
5	1.50+00	4.97-01	2.29-01											
4	3.19+00	1.00+00												
3	8.94+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.15-06	4.30-06	3.63-06	3.09-06	2.65-06	2.29-06	1.99-06	1.74-06	1.53-06	1.36-06	1.21-06	1.08-06	9.66-07	8.69-07
45	6.73-06	5.61-06	4.73-06	4.03-06	3.46-06	2.99-06	2.60-06	2.27-06	2.00-06	1.77-06	1.57-06	1.41-06	1.26-06	1.13-06
40	9.15-06	7.63-06	6.44-06	5.48-06	4.70-06	4.06-06	3.53-06	3.09-06	2.72-06	2.41-06	2.14-06	1.91-06	1.71-06	1.53-06
35	1.33-05	1.11-05	9.34-06	7.95-06	6.82-06	5.89-06	5.12-06	4.48-06	3.94-06	3.48-06	3.09-06	2.75-06	2.45-06	2.20-06
30	2.09-05	1.75-05	1.48-05	1.26-05	1.08-05	9.31-06	8.08-06	7.05-06	6.18-06	5.43-06	4.77-06	4.18-06	3.61-06	2.95-06
29	2.32-05	1.94-05	1.64-05	1.39-05	1.20-05	1.03-05	8.95-06	7.80-06	6.82-06	5.97-06	5.21-06	4.48-06	3.65-06	
28	2.59-05	2.16-05	1.83-05	1.55-05	1.33-05	1.15-05	9.95-06	8.65-06	7.53-06	6.54-06	5.61-06	4.54-06		
27	2.90-05	2.42-05	2.04-05	1.74-05	1.49-05	1.28-05	1.11-05	9.60-06	8.30-06	7.08-06	5.71-06			
26	3.26-05	2.72-05	2.30-05	1.95-05	1.67-05	1.43-05	1.24-05	1.06-05	9.02-06	7.24-06				
25	3.68-05	3.08-05	2.59-05	2.20-05	1.88-05	1.61-05	1.37-05	1.16-05	9.27-06					
24	4.19-05	3.49-05	2.94-05	2.49-05	2.12-05	1.80-05	1.51-05	1.20-05						
23	4.78-05	3.98-05	3.35-05	2.82-05	2.38-05	1.98-05	1.57-05							
22	5.48-05	4.56-05	3.81-05	3.19-05	2.64-05	2.07-05								
21	6.31-05	5.22-05	4.33-05	3.56-05	2.77-05									
20	7.28-05	5.97-05	4.86-05	3.75-05										
19	8.38-05	6.75-05	5.16-05											
18	9.55-05	7.22-05												
17	1.03-04													

HE + TE = 5.00+04 NE = 1.00+06 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.31-32	2.91-39	9.65-40	-3.81-39	-1.38-38	-3.15-38	-5.94-38	-1.00-37	-1.57-37	-2.34-37	-3.35-37	-4.69-37	-6.48-37	-8.88-37
45	1.80-32	4.20-39	2.15-39	-2.70-39	-1.27-38	-2.95-38	-5.43-38	-8.75-38	-1.28-37	-1.76-37	-2.28-37	-2.83-37	-3.40-37	-4.02-37
40	2.57-32	6.27-39	4.24-39	-3.14-40	-9.32-39	-2.30-38	-3.96-38	-5.45-38	-5.98-38	-4.26-38	1.53-38	1.39-37	3.61-37	7.20-37
35	3.85-32	9.76-39	7.93-39	4.20-39	-2.66-39	-1.04-38	-1.23-38	4.74-39	6.30-38	1.97-37	4.61-37	9.30-37	1.71-36	2.97-36
30	6.14-32	1.63-38	1.55-38	1.47-38	1.40-38	2.01-38	4.86-38	1.28-37	3.09-37	6.71-37	1.34-36	2.53-36	4.55-36	7.89-36
29	6.80-32	1.82-38	1.79-38	1.83-38	2.02-38	3.14-38	7.01-38	1.70-37	3.88-37	8.22-37	1.62-36	3.04-36	5.47-36	9.54-36
28	7.57-32	2.05-38	2.08-38	2.28-38	2.79-38	4.55-38	9.65-38	2.20-37	4.84-37	1.00-36	1.96-36	3.65-36	6.58-36	1.16-35
27	8.45-32	2.31-38	2.42-38	2.84-38	3.75-38	6.29-38	1.29-37	2.81-37	5.98-37	1.21-36	2.35-36	4.38-36	7.92-36	1.40-35
26	9.48-32	2.62-38	2.84-38	3.51-38	4.94-38	8.43-38	1.68-37	3.54-37	7.33-37	1.46-36	2.82-36	5.25-36	9.55-36	1.71-35
25	1.07-31	2.98-38	3.33-38	4.34-38	6.39-38	1.11-37	2.16-37	4.41-37	8.93-37	1.76-36	3.37-36	6.28-36	1.15-35	2.09-35
24	1.21-31	3.41-38	3.92-38	5.34-38	8.16-38	1.42-37	2.73-37	5.43-37	1.08-36	2.10-36	4.01-36	7.51-36	1.39-35	2.57-35
23	1.38-31	3.91-38	4.62-38	6.54-38	1.03-37	1.80-37	3.40-37	6.64-37	1.30-36	2.50-36	4.77-36	8.98-36	1.69-35	3.18-35
22	1.58-31	4.51-38	5.46-38	7.99-38	1.29-37	2.26-37	4.20-37	8.04-37	1.55-36	2.97-36	5.65-36	1.07-35	2.05-35	3.98-35
21	1.82-31	5.22-38	6.46-38	9.73-38	1.60-37	2.80-37	5.15-37	9.69-37	1.84-36	3.51-36	6.69-36	1.29-35	2.52-35	5.07-35
20	2.12-31	6.08-38	7.67-38	1.18-37	1.97-37	3.45-37	6.27-37	1.16-36	2.18-36	4.14-36	7.94-36	1.55-35	3.12-35	6.61-35
19	2.48-31	7.12-38	9.13-38	1.44-37	2.42-37	4.24-37	7.61-37	1.39-36	2.58-36	4.88-36	9.43-36	1.88-35	3.93-35	8.90-35
18	2.93-31	8.40-38	1.09-37	1.75-37	2.97-37	5.20-37	9.25-37	1.67-36	3.07-36	5.78-36	1.13-35	2.29-35	5.03-35	1.24-34
17	3.50-31	1.00-37	1.32-37	2.14-37	3.67-37	6.43-37	1.14-36	2.03-36	3.71-36	6.94-36	1.35-35	2.80-35	6.37-35	1.68-34
16	4.23-31	1.21-37	1.60-37	2.64-37	4.59-37	8.07-37	1.43-36	2.54-36	4.57-36	8.45-36	1.61-35	3.15-35	5.37-35	-2.60-34
15	5.17-31	1.47-37	1.98-37	3.32-37	5.85-37	1.04-36	1.85-36	3.28-36	5.85-36	1.03-35	1.66-35	3.68-36	-6.03-34	
14	6.43-31	1.83-37	2.49-37	4.25-37	7.66-37	1.39-36	2.52-36	4.50-36	7.80-36	1.13-35	-9.80-36	-6.61-34		
13	8.14-31	2.33-37	3.21-37	5.63-37	1.05-36	1.97-36	3.67-36	6.66-36	1.04-35	-5.01-36	-5.68-34			
12	1.05-30	3.03-37	4.27-37	7.74-37	1.51-36	2.99-36	5.89-36	1.08-35	6.31-36	-4.06-34				
11	1.39-30	4.06-37	5.90-37	1.12-36	2.33-36	5.02-36	1.08-35	1.70-35	-2.29-34					
10	1.91-30	5.65-37	8.56-37	1.75-36	4.00-36	9.81-36	2.35-35	-7.28-35						
9	2.72-30	8.26-37	1.33-36	3.00-36	8.05-36	2.47-35	4.07-35							
8	4.09-30	1.29-36	2.27-36	6.06-36	2.16-35	1.01-34								
7	6.61-30	2.21-36	4.52-36	1.64-35	1.13-34									
6	1.19-29	4.40-36	1.19-35	9.15-35										
5	2.56-29	1.15-35	6.31-35											
4	7.73-29	5.69-35												
3	5.72-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.22-36	-1.68-36	-2.33-36	-3.28-36	-4.65-36	-6.65-36	-9.55-36	-1.38-35	-1.98-35	-2.85-35	-4.08-35	-5.82-35	-8.27-35	-1.17-34
45	-4.81-37	-5.98-37	-7.96-37	-1.16-36	-1.81-36	-2.95-36	-4.92-36	-8.22-36	-1.36-35	-2.22-35	-3.56-35	-5.64-35	-8.83-35	-1.37-34
40	1.27-36	2.05-36	3.12-36	4.53-36	6.29-36	8.38-36	1.06-35	1.27-35	1.40-35	1.34-35	8.58-36	-4.14-36	-3.17-35	-8.66-35
35	4.91-36	7.83-36	1.22-35	1.85-35	2.76-35	4.06-35	5.90-35	8.52-35	1.22-34	1.75-34	2.52-34	3.62-34	5.25-34	7.67-34
30	1.33-35	2.21-35	3.64-35	5.94-35	9.72-35	1.60-34	2.69-34	4.64-34	8.33-34	1.59-33	3.37-33	8.42-33	2.86-32	2.12-31
29	1.63-35	2.74-35	4.58-35	7.64-35	1.29-34	2.20-34	3.86-34	7.07-34	1.38-33	2.98-33	7.59-33	2.65-32	2.01-31	
28	1.99-35	3.41-35	5.81-35	9.96-35	1.73-34	3.10-34	5.77-34	1.15-33	2.51-33	6.52-33	2.32-32	1.80-31		
27	2.45-35	4.27-35	7.46-35	1.32-34	2.40-34	4.54-34	9.15-34	2.04-33	5.36-33	1.94-32	1.52-31			
26	3.04-35	5.40-35	9.73-35	1.79-34	3.44-34	7.04-34	1.59-33	4.23-33	1.54-32	1.22-31				
25	3.79-35	6.93-35	1.30-34	2.52-34	5.21-34	1.19-33	3.19-33	1.17-32	9.35-32					
24	4.78-35	9.06-35	1.78-34	3.71-34	8.53-34	2.31-33	8.52-33	6.78-32						
23	6.11-35	1.21-34	2.55-34	5.89-34	1.60-33	5.90-33	4.67-32							
22	7.97-35	1.69-34	3.90-34	1.06-33	3.87-33	3.03-32								
21	1.07-34	2.48-34	6.69-34	2.41-33	1.84-32									
20	1.52-34	4.03-34	1.42-33	1.04-32										
19	2.31-34	7.80-34	5.31-33											
18	3.89-34	2.25-33												
17	5.81-34													

HE + TE = 5.00+04 NE = 1.00+07 CASE B NC = 61

TOTAL RC = 4.311-13 4-3 RC = 5.956-14 4-3 EM = 2.524-25 2S RC = 1.443-13 2P RC = 2.868-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.70-03	8.27-04	3.56-04	1.84-04	1.07-04	6.81-05	4.58-05	3.23-05	2.36-05	1.78-05	1.37-05	1.08-05	8.67-06	7.05-06
45	3.59-03	1.10-03	4.74-04	2.46-04	1.43-04	9.08-05	6.11-05	4.30-05	3.15-05	2.37-05	1.83-05	1.44-05	1.16-05	9.40-06
40	4.88-03	1.50-03	6.44-04	3.34-04	1.95-04	1.23-04	8.30-05	5.85-05	4.28-05	3.22-05	2.49-05	1.96-05	1.57-05	1.28-05
35	6.80-03	2.09-03	8.98-04	4.65-04	2.72-04	1.72-04	1.16-04	8.17-05	5.97-05	4.50-05	3.47-05	2.74-05	2.19-05	1.78-05
30	9.93-03	3.05-03	1.32-03	6.83-04	3.99-04	2.53-04	1.70-04	1.20-04	8.80-05	6.63-05	5.12-05	4.03-05	3.23-05	2.63-05
29	1.08-02	3.33-03	1.43-03	7.45-04	4.35-04	2.76-04	1.86-04	1.31-04	9.61-05	7.24-05	5.59-05	4.40-05	3.53-05	2.87-05
28	1.18-02	3.64-03	1.57-03	8.16-04	4.77-04	3.03-04	2.04-04	1.44-04	1.05-04	7.95-05	6.14-05	4.84-05	3.88-05	3.15-05
27	1.30-02	4.00-03	1.73-03	8.98-04	5.26-04	3.34-04	2.25-04	1.59-04	1.16-04	8.77-05	6.77-05	5.34-05	4.28-05	3.48-05
26	1.43-02	4.42-03	1.91-03	9.94-04	5.82-04	3.70-04	2.50-04	1.76-04	1.29-04	9.73-05	7.52-05	5.93-05	4.75-05	3.86-05
25	1.59-02	4.90-03	2.12-03	1.10-03	6.48-04	4.12-04	2.78-04	1.97-04	1.44-04	1.09-04	8.39-05	6.62-05	5.31-05	4.32-05
24	1.76-02	5.45-03	2.36-03	1.23-03	7.24-04	4.61-04	3.12-04	2.21-04	1.62-04	1.22-04	9.43-05	7.44-05	5.96-05	4.85-05
23	1.97-02	6.10-03	2.65-03	1.39-03	8.15-04	5.20-04	3.52-04	2.49-04	1.83-04	1.38-04	1.07-04	8.41-05	6.74-05	5.48-05
22	2.20-02	6.84-03	2.98-03	1.56-03	9.22-04	5.89-04	3.99-04	2.83-04	2.08-04	1.57-04	1.21-04	9.58-05	7.68-05	6.25-05
21	2.48-02	7.72-03	3.38-03	1.78-03	1.05-03	6.72-04	4.56-04	3.24-04	2.38-04	1.80-04	1.39-04	1.10-04	8.82-05	7.16-05
20	2.80-02	8.75-03	3.84-03	2.03-03	1.20-03	7.73-04	5.26-04	3.74-04	2.75-04	2.08-04	1.61-04	1.27-04	1.02-04	8.27-05
19	3.18-02	9.98-03	4.41-03	2.34-03	1.39-03	8.97-04	6.12-04	4.36-04	3.21-04	2.43-04	1.89-04	1.49-04	1.19-04	9.62-05
18	3.64-02	1.15-02	5.09-03	2.72-03	1.63-03	1.05-03	7.19-04	5.13-04	3.79-04	2.87-04	2.22-04	1.75-04	1.40-04	1.12-04
17	4.20-02	1.33-02	5.95-03	3.19-03	1.92-03	1.25-03	8.54-04	6.11-04	4.51-04	3.42-04	2.65-04	2.08-04	1.65-04	1.30-04
16	4.89-02	1.56-02	7.02-03	3.80-03	2.30-03	1.50-03	1.03-03	7.36-04	5.44-04	4.12-04	3.18-04	2.48-04	1.93-04	1.43-04
15	5.77-02	1.85-02	8.41-03	4.59-03	2.79-03	1.82-03	1.25-03	8.99-04	6.64-04	5.01-04	3.84-04	2.94-04	2.15-04	
14	6.91-02	2.22-02	1.02-02	5.62-03	3.43-03	2.25-03	1.55-03	1.11-03	8.19-04	6.13-04	4.61-04	3.32-04		
13	8.43-02	2.73-02	1.27-02	7.02-03	4.31-03	2.83-03	1.95-03	1.39-03	1.02-03	7.49-04	5.23-04			
12	1.05-01	3.42-02	1.61-02	8.95-03	5.51-03	3.62-03	2.49-03	1.76-03	1.27-03	8.73-04				
11	1.34-01	4.41-02	2.09-02	1.17-02	7.19-03	4.72-03	3.22-03	2.24-03	1.51-03					
10	1.77-01	5.85-02	2.79-02	1.56-02	9.62-03	6.27-03	4.21-03	2.75-03						
9	2.41-01	8.05-02	3.85-02	2.16-02	1.32-02	8.48-03	5.34-03							
8	3.45-01	1.15-01	5.52-02	3.09-02	1.87-02	1.12-02								
7	5.21-01	1.74-01	8.33-02	4.61-02	2.62-02									
6	8.47-01	2.82-01	1.34-01	7.01-02										
5	1.53+00	5.01-01	2.27-01											
4	3.24+00	1.00+00												
3	9.04+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.82-06	4.85-06	4.09-06	3.48-06	2.99-06	2.58-06	2.24-06	1.96-06	1.73-06	1.53-06	1.36-06	1.21-06	1.09-06	9.78-07
45	7.75-06	6.47-06	5.45-06	4.64-06	3.98-06	3.44-06	2.99-06	2.61-06	2.30-06	2.03-06	1.81-06	1.61-06	1.45-06	1.30-06
40	1.05-05	8.79-06	7.41-06	6.30-06	5.40-06	4.66-06	4.06-06	3.55-06	3.12-06	2.76-06	2.45-06	2.18-06	1.95-06	1.76-06
35	1.47-05	1.23-05	1.03-05	8.79-06	7.53-06	6.50-06	5.65-06	4.94-06	4.34-06	3.83-06	3.39-06	3.02-06	2.69-06	2.41-06
30	2.17-05	1.81-05	1.52-05	1.29-05	1.11-05	9.53-06	8.26-06	7.20-06	6.30-06	5.53-06	4.86-06	4.25-06	3.68-06	3.00-06
29	2.37-05	1.97-05	1.66-05	1.41-05	1.21-05	1.04-05	9.00-06	7.84-06	6.84-06	5.98-06	5.21-06	4.49-06	3.65-06	
28	2.60-05	2.17-05	1.82-05	1.55-05	1.32-05	1.14-05	9.85-06	8.55-06	7.44-06	6.45-06	5.53-06	4.48-06		
27	2.87-05	2.39-05	2.01-05	1.71-05	1.46-05	1.25-05	1.08-05	9.35-06	8.07-06	6.89-06	5.56-06			
26	3.18-05	2.65-05	2.23-05	1.89-05	1.61-05	1.38-05	1.19-05	1.02-05	8.67-06	6.96-06				
25	3.55-05	2.96-05	2.49-05	2.10-05	1.79-05	1.53-05	1.31-05	1.10-05	8.82-06					
24	3.99-05	3.32-05	2.79-05	2.36-05	2.00-05	1.69-05	1.42-05	1.13-05						
23	4.51-05	3.75-05	3.14-05	2.65-05	2.23-05	1.86-05	1.47-05							
22	5.14-05	4.26-05	3.56-05	2.97-05	2.46-05	1.93-05								
21	5.88-05	4.86-05	4.03-05	3.31-05	2.58-05									
20	6.77-05	5.56-05	4.53-05	3.51-05										
19	7.82-05	6.31-05	4.84-05											
18	8.96-05	6.81-05												
17	9.77-05													

HE + TE = 5.00+04 NE = 1.00+07 CASE B NC = 61

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	9.07-33	2.61-39	-4.50-40	-8.36-39	-2.57-38	-5.84-38	-1.15-37	-2.05-37	-3.46-37	-5.60-37	-8.79-37	-1.35-36	-2.03-36	-3.01-36
45	1.25-32	3.70-39	-1.28-40	-1.00-38	-3.17-38	-7.26-38	-1.43-37	-2.56-37	-4.34-37	-7.04-37	-1.11-36	-1.72-36	-2.61-36	-3.93-36
40	1.78-32	5.54-39	9.22-40	-1.09-38	-3.70-38	-8.58-38	-1.69-37	-3.03-37	-5.12-37	-8.33-37	-1.32-36	-2.06-36	-3.19-36	-4.88-36
35	2.66-32	8.85-39	3.72-39	-9.22-39	-3.75-38	-8.92-38	-1.75-37	-3.10-37	-5.16-37	-8.31-37	-1.31-36	-2.06-36	-3.25-36	-5.12-36
30	4.24-32	1.51-38	1.01-38	-1.88-39	-2.74-38	-7.09-38	-1.35-37	-2.20-37	-3.30-37	-4.72-37	-6.68-37	-9.77-37	-1.52-36	-2.53-36
29	4.70-32	1.70-38	1.21-38	5.54-40	-2.38-38	-6.39-38	-1.19-37	-1.87-37	-2.60-37	-3.33-37	-4.10-37	-5.21-37	-7.45-37	-1.29-36
28	5.23-32	1.91-38	1.44-38	3.41-39	-1.95-38	-5.57-38	-1.01-37	-1.47-37	-1.75-37	-1.64-37	-8.99-38	5.67-38	2.54-37	3.82-37
27	5.85-32	2.16-38	1.71-38	6.81-39	-1.44-38	-4.59-38	-7.97-38	-9.85-38	-7.20-38	4.38-38	3.09-37	7.92-37	1.56-36	2.63-36
26	6.56-32	2.45-38	2.03-38	1.09-38	-8.13-39	-3.38-38	-5.34-38	-3.99-38	5.40-38	3.02-37	8.15-37	1.74-36	3.30-36	5.72-36
25	7.39-32	2.79-38	2.41-38	1.60-38	-1.71-40	-1.86-38	-2.04-38	3.36-38	2.13-37	6.31-37	1.47-36	3.01-36	5.67-36	1.01-35
24	8.37-32	3.20-38	2.88-38	2.25-38	1.02-38	1.37-39	2.26-38	1.28-37	4.18-37	1.06-36	2.34-36	4.73-36	9.02-36	1.66-35
23	9.53-32	3.69-38	3.47-38	3.09-38	2.41-38	2.83-38	7.98-38	2.54-37	6.89-37	1.63-36	3.53-36	7.14-36	1.39-35	2.64-35
22	1.09-31	4.28-38	4.20-38	4.19-38	4.30-38	6.50-38	1.57-37	4.23-37	1.06-36	2.42-36	5.18-36	1.06-35	2.12-35	4.22-35
21	1.26-31	5.01-38	5.13-38	5.64-38	6.87-38	1.15-37	2.63-37	6.52-37	1.55-36	3.50-36	7.54-36	1.58-35	3.27-35	6.87-35
20	1.46-31	5.90-38	6.31-38	7.57-38	1.04-37	1.85-37	4.08-37	9.64-37	2.24-36	5.03-36	1.10-35	2.37-35	5.16-35	1.17-34
19	1.71-31	7.01-38	7.83-38	1.01-37	1.51-37	2.79-37	6.05-37	1.39-36	3.19-36	7.20-36	1.61-35	3.62-35	8.46-35	2.13-34
18	2.03-31	8.41-38	9.79-38	1.36-37	2.16-37	4.07-37	8.73-37	1.98-36	4.52-36	1.04-35	2.40-35	5.74-35	1.48-34	4.42-34
17	2.42-31	1.02-37	1.23-37	1.81-37	3.03-37	5.82-37	1.24-36	2.78-36	6.41-36	1.51-35	3.68-35	9.65-35	2.92-34	1.17-33
16	2.92-31	1.25-37	1.56-37	2.41-37	4.19-37	8.18-37	1.74-36	3.91-36	9.16-36	2.25-35	5.93-35	1.80-34	7.19-34	5.91-33
15	3.57-31	1.53-37	1.99-37	3.21-37	5.78-37	1.14-36	2.43-36	5.52-36	1.33-35	3.48-35	1.04-34	4.07-34	3.17-33	
14	4.44-31	1.91-37	2.56-37	4.29-37	7.95-37	1.59-36	3.43-36	7.93-36	2.01-35	5.79-35	2.15-34	1.50-33		
13	5.62-31	2.42-37	3.33-37	5.79-37	1.10-36	2.26-36	4.94-36	1.18-35	3.21-35	1.08-34	6.06-34			
12	7.26-31	3.13-37	4.43-37	7.98-37	1.58-36	3.32-36	7.50-36	1.88-35	5.54-35	1.86-34				
11	9.62-31	4.17-37	6.06-37	1.14-36	2.37-36	5.25-36	1.26-35	3.31-35	3.77-35					
10	1.32-30	5.76-37	8.69-37	1.74-36	3.90-36	9.54-36	2.52-35	1.79-35						
9	1.87-30	8.36-37	1.33-36	2.92-36	7.51-36	2.21-35	4.81-35							
8	2.81-30	1.30-36	2.25-36	5.77-36	1.92-35	8.12-35								
7	4.54-30	2.22-36	4.44-36	1.53-35	9.34-35									
6	8.17-30	4.40-36	1.16-35	8.17-35										
5	1.75-29	1.15-35	6.03-35											
4	5.24-29	5.68-35												
3	3.81-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-4.41-36	-6.38-36	-9.12-36	-1.29-35	-1.81-35	-2.50-35	-3.44-35	-4.68-35	-6.33-35	-8.49-35	-1.13-34	-1.50-34	-1.97-34	-2.58-34
45	-5.84-36	-8.60-36	-1.25-35	-1.81-35	-2.59-35	-3.68-35	-5.19-35	-7.26-35	-1.01-34	-1.40-34	-1.94-34	-2.66-34	-3.65-34	-5.00-34
40	-7.42-36	-1.12-35	-1.69-35	-2.52-35	-3.74-35	-5.52-35	-8.11-35	-1.19-34	-1.74-34	-2.55-34	-3.74-34	-5.50-34	-8.14-34	-1.21-33
35	-8.11-36	-1.29-35	-2.05-35	-3.25-35	-5.16-35	-8.18-35	-1.30-34	-2.07-34	-3.34-34	-5.45-34	-9.05-34	-1.54-33	-2.70-33	-4.98-33
30	-4.51-36	-8.35-36	-1.57-35	-2.98-35	-5.65-35	-1.08-34	-2.08-34	-4.12-34	-8.50-34	-1.87-33	-4.57-33	-1.32-32	-3.29-32	-4.63-31
29	-2.58-36	-5.50-36	-1.18-35	-2.49-35	-5.19-35	-1.08-34	-2.26-34	-4.89-34	-1.12-33	-2.84-33	-8.51-33	-3.51-32	-3.17-31	
28	1.05-37	-1.34-36	-5.64-36	-1.65-35	-4.72-35	-1.01-34	-2.40-34	-5.93-34	-1.59-33	-5.00-33	-2.15-32	-2.02-31		
27	3.87-36	4.78-36	4.01-36	-1.88-36	-2.15-35	-7.79-35	-2.38-34	-7.31-34	-2.53-33	-1.17-32	-1.17-31			
26	9.26-36	1.40-35	1.96-35	2.40-35	2.02-35	-1.58-35	-1.76-34	-8.82-34	-4.96-33	-5.64-32				
25	1.73-35	2.86-35	4.62-35	7.28-35	1.11-34	1.58-34	1.40-34	-6.57-34	-1.65-32					
24	2.97-35	5.27-35	9.42-35	1.73-34	3.34-34	7.18-34	1.90-33	8.12-33						
23	4.99-35	9.53-35	1.89-34	4.03-34	9.87-34	3.21-33	2.17-32							
22	8.48-35	1.77-34	4.00-34	1.05-33	3.67-33	2.75-32								
21	1.50-34	3.53-34	9.66-34	3.56-33	2.80-32									
20	2.86-34	8.09-34	3.08-33	2.51-32										
19	6.21-34	2.43-33	2.03-32											
18	1.76-33	1.48-32												
17	9.85-33													

HE + TE = 5.00+04 NE = 1.00+08 CASE B NC = 39

TOTAL RC = 4.334-13 4-3 RC = 5.853-14 4-3 EM = 2.481-25 2S RC = 1.454-13 2P RC = 2.880-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.86-03	8.76-04	3.77-04	1.95-04	1.14-04	7.21-05	4.85-05	3.42-05	2.50-05	1.88-05	1.45-05	1.14-05	9.17-06	7.46-06
45	3.89-03	1.19-03	5.13-04	2.66-04	1.55-04	9.82-05	6.61-05	4.66-05	3.40-05	2.56-05	1.98-05	1.56-05	1.25-05	1.02-05
40	5.47-03	1.68-03	7.21-04	3.74-04	2.18-04	1.38-04	9.28-05	6.54-05	4.78-05	3.60-05	2.78-05	2.19-05	1.75-05	1.43-05
35	7.93-03	2.43-03	1.05-03	5.41-04	3.16-04	2.00-04	1.35-04	9.48-05	6.93-05	5.21-05	4.02-05	3.17-05	2.54-05	2.06-05
30	1.19-02	3.65-03	1.57-03	8.12-04	4.74-04	3.00-04	2.02-04	1.42-04	1.04-04	7.82-05	6.03-05	4.75-05	3.80-05	3.09-05
29	1.30-02	3.97-03	1.71-03	8.85-04	5.16-04	3.27-04	2.20-04	1.55-04	1.13-04	8.52-05	6.57-05	5.17-05	4.14-05	3.36-05
28	1.41-02	4.34-03	1.86-03	9.65-04	5.63-04	3.57-04	2.40-04	1.69-04	1.23-04	9.29-05	7.16-05	5.64-05	4.51-05	3.67-05
27	1.54-02	4.74-03	2.04-03	1.06-03	6.15-04	3.90-04	2.62-04	1.85-04	1.35-04	1.02-04	7.83-05	6.16-05	4.93-05	4.01-05
26	1.69-02	5.19-03	2.23-03	1.16-03	6.74-04	4.27-04	2.87-04	2.02-04	1.48-04	1.11-04	8.58-05	6.75-05	5.40-05	4.39-05
25	1.86-02	5.70-03	2.45-03	1.27-03	7.41-04	4.70-04	3.16-04	2.23-04	1.63-04	1.22-04	9.43-05	7.41-05	5.93-05	4.82-05
24	2.05-02	6.29-03	2.71-03	1.40-03	8.18-04	5.18-04	3.49-04	2.46-04	1.79-04	1.35-04	1.04-04	8.18-05	6.54-05	5.31-05
23	2.27-02	6.97-03	3.00-03	1.56-03	9.08-04	5.75-04	3.87-04	2.73-04	1.99-04	1.50-04	1.15-04	9.07-05	7.26-05	5.89-05
22	2.53-02	7.78-03	3.35-03	1.74-03	1.01-03	6.42-04	4.32-04	3.05-04	2.22-04	1.67-04	1.29-04	1.01-04	8.09-05	6.56-05
21	2.84-02	8.74-03	3.76-03	1.95-03	1.14-03	7.23-04	4.87-04	3.43-04	2.50-04	1.88-04	1.45-04	1.14-04	9.10-05	7.36-05
20	3.22-02	9.90-03	4.27-03	2.22-03	1.29-03	8.21-04	5.53-04	3.90-04	2.85-04	2.14-04	1.65-04	1.29-04	1.03-04	8.33-05
19	3.67-02	1.13-02	4.88-03	2.54-03	1.48-03	9.41-04	6.34-04	4.47-04	3.26-04	2.45-04	1.89-04	1.48-04	1.18-04	9.49-05
18	4.22-02	1.30-02	5.63-03	2.93-03	1.72-03	1.09-03	7.35-04	5.18-04	3.78-04	2.84-04	2.19-04	1.71-04	1.36-04	1.09-04
17	4.90-02	1.51-02	6.55-03	3.42-03	2.01-03	1.28-03	8.61-04	6.07-04	4.44-04	3.33-04	2.56-04	2.00-04	1.57-04	1.24-04
16	5.72-02	1.77-02	7.71-03	4.03-03	2.37-03	1.51-03	1.02-03	7.21-04	5.27-04	3.95-04	3.03-04	2.35-04	1.82-04	1.35-04
15	6.75-02	2.10-02	9.16-03	4.81-03	2.84-03	1.81-03	1.23-03	8.67-04	6.34-04	4.75-04	3.61-04	2.76-04	2.02-04	
14	8.05-02	2.51-02	1.10-02	5.83-03	3.45-03	2.21-03	1.50-03	1.06-03	7.74-04	5.76-04	4.32-04	3.11-04		
13	9.72-02	3.05-02	1.35-02	7.18-03	4.27-03	2.75-03	1.87-03	1.32-03	9.58-04	7.03-04	4.97-04			
12	1.20-01	3.77-02	1.68-02	9.03-03	5.41-03	3.49-03	2.37-03	1.67-03	1.19-03	8.26-04				
11	1.50-01	4.76-02	2.15-02	1.16-02	7.01-03	4.53-03	3.07-03	2.13-03	1.44-03					
10	1.94-01	6.19-02	2.84-02	1.55-02	9.36-03	6.04-03	4.03-03	2.63-03						
9	2.60-01	8.36-02	3.88-02	2.13-02	1.29-02	8.19-03	5.14-03							
8	3.64-01	1.18-01	5.55-02	3.05-02	1.82-02	1.69-02								
7	5.42-01	1.77-01	8.35-02	4.55-02	2.55-02									
6	8.73-01	2.86-01	1.33-01	6.87-02										
5	1.57+00	5.07-01	2.24-01											
4	3.31+00	1.00+00												
3	9.18+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.15-06	5.13-06	4.33-06	3.68-06	3.16-06	2.73-06	2.37-06	2.08-06	1.83-06	1.62-06	1.44-06	1.28-06	1.15-06	1.03-06
45	8.38-06	6.99-06	5.89-06	5.01-06	4.30-06	3.71-06	3.23-06	2.82-06	2.48-06	2.20-06	1.95-06	1.74-06	1.56-06	1.40-06
40	1.18-05	9.80-06	8.26-06	7.02-06	6.02-06	5.20-06	4.52-06	3.95-06	3.47-06	3.07-06	2.73-06	2.43-06	2.18-06	1.95-06
35	1.70-05	1.42-05	1.19-05	1.02-05	8.70-06	7.50-06	6.52-06	5.70-06	5.00-06	4.41-06	3.91-06	3.48-06	3.10-06	2.78-06
30	2.55-05	2.12-05	1.78-05	1.51-05	1.30-05	1.12-05	9.67-06	8.43-06	7.37-06	6.46-06	5.67-06	4.96-06	4.29-06	3.50-06
29	2.77-05	2.31-05	1.94-05	1.65-05	1.41-05	1.21-05	1.05-05	9.13-06	7.96-06	6.96-06	6.06-06	5.21-06	4.24-06	
28	3.02-05	2.51-05	2.11-05	1.79-05	1.53-05	1.32-05	1.14-05	9.88-06	8.59-06	7.45-06	6.38-06	5.17-06		
27	3.30-05	2.74-05	2.31-05	1.95-05	1.67-05	1.43-05	1.24-05	1.07-05	9.22-06	7.86-06	6.33-06			
26	3.61-05	3.00-05	2.52-05	2.13-05	1.82-05	1.56-05	1.34-05	1.15-05	9.75-06	7.82-06				
25	3.96-05	3.29-05	2.76-05	2.34-05	1.99-05	1.70-05	1.45-05	1.22-05	9.74-06					
24	4.37-05	3.63-05	3.04-05	2.56-05	2.17-05	1.84-05	1.54-05	1.22-05						
23	4.83-05	4.01-05	3.35-05	2.82-05	2.37-05	1.97-05	1.56-05							
22	5.38-05	4.45-05	3.71-05	3.09-05	2.56-05	2.01-05								
21	6.03-05	4.97-05	4.11-05	3.37-05	2.62-05									
20	6.79-05	5.56-05	4.52-05	3.49-05										
19	7.68-05	6.18-05	4.73-05											
18	8.65-05	6.56-05												
17	9.29-05													

HE + TE = 5.00+04 NE = 1.00+08 CASE B NC = 39

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.64-33	2.51-39	-1.01-39	-1.03-38	-3.13-38	-7.21-38	-1.45-37	-2.67-37	-4.63-37	-7.66-37	-1.22-36	-1.89-36	-2.85-36	-4.19-36
45	1.19-32	3.48-39	-1.28-39	-1.40-38	-4.26-38	-9.87-38	-1.99-37	-3.69-37	-6.45-37	-1.08-36	-1.73-36	-2.71-36	-4.14-36	-6.16-36
40	1.69-32	5.04-39	-1.52-39	-1.91-38	-5.91-38	-1.38-37	-2.81-37	-5.25-37	-9.27-37	-1.56-36	-2.55-36	-4.06-36	-6.29-36	-9.56-36
35	2.54-32	7.82-39	-1.20-39	-2.55-38	-8.14-38	-1.93-37	-3.97-37	-7.52-37	-1.32-36	-2.31-36	-3.86-36	-6.27-36	-9.99-36	-1.56-35
30	4.04-32	1.33-38	1.32-39	-3.11-38	-1.07-37	-2.60-37	-5.45-37	-1.05-36	-1.92-36	-3.40-36	-5.85-36	-9.90-36	-1.65-35	-2.72-35
29	4.48-32	1.50-38	2.49-39	-3.14-38	-1.11-37	-2.72-37	-5.72-37	-1.11-36	-2.04-36	-3.64-36	-6.32-36	-1.08-35	-1.82-35	-3.05-35
28	4.99-32	1.69-38	4.04-39	-3.11-38	-1.14-37	-2.82-37	-5.97-37	-1.16-36	-2.15-36	-3.87-36	-6.79-36	-1.17-35	-2.01-35	-3.42-35
27	5.57-32	1.93-38	6.06-39	-3.01-38	-1.15-37	-2.89-37	-6.16-37	-1.21-36	-2.25-36	-4.08-36	-7.24-36	-1.27-35	-2.21-35	-3.84-35
26	6.25-32	2.21-38	8.66-39	-2.81-38	-1.15-37	-2.93-37	-6.28-37	-1.24-36	-2.33-36	-4.25-36	-7.65-36	-1.37-35	-2.43-35	-4.32-35
25	7.04-32	2.54-38	1.20-38	-2.49-38	-1.13-37	-2.92-37	-6.31-37	-1.25-36	-2.37-36	-4.38-36	-8.00-36	-1.46-35	-2.65-35	-4.85-35
24	7.97-32	2.94-38	1.61-38	-2.03-38	-1.07-37	-2.86-37	-6.23-37	-1.24-36	-2.37-36	-4.44-36	-8.25-36	-1.54-35	-2.88-35	-5.45-35
23	9.08-32	3.42-38	2.13-38	-1.42-38	-9.96-38	-2.74-37	-6.03-37	-1.21-36	-2.33-36	-4.42-36	-8.37-36	-1.60-35	-3.11-35	-6.15-35
22	1.04-31	4.00-38	2.76-38	-6.26-39	-8.86-38	-2.56-37	-5.70-37	-1.15-36	-2.23-36	-4.28-36	-8.31-36	-1.65-35	-3.34-35	-6.99-35
21	1.20-31	4.70-38	3.55-38	3.75-39	-7.42-38	-2.31-37	-5.22-37	-1.05-36	-2.05-36	-4.00-36	-7.99-36	-1.65-35	-3.56-35	-8.02-35
20	1.39-31	5.56-38	4.52-38	1.65-38	-5.54-38	-1.98-37	-4.54-37	-9.14-37	-1.77-36	-3.50-36	-7.23-36	-1.59-35	-3.72-35	-9.34-35
19	1.63-31	6.62-38	5.75-38	3.30-38	-3.00-38	-1.51-37	-3.56-37	-7.02-37	-1.32-36	-2.60-36	-5.62-36	-1.36-35	-3.64-35	-1.09-34
18	1.93-31	7.96-38	7.35-38	5.54-38	5.96-39	-8.23-38	-2.07-37	-3.63-37	-5.56-37	-9.21-37	-2.10-36	-6.87-36	-2.65-35	-1.15-34
17	2.30-31	9.68-38	9.48-38	8.68-38	5.95-38	2.46-38	3.39-38	2.10-37	8.25-37	2.41-36	5.97-36	1.28-35	2.21-35	-5.67-36
16	2.78-31	1.19-37	1.24-37	1.32-37	1.42-37	1.97-37	4.38-37	1.22-36	3.44-36	9.48-36	2.62-35	7.77-35	2.85-34	2.02-33
15	3.41-31	1.49-37	1.64-37	2.00-37	2.71-37	4.81-37	1.13-36	3.06-36	8.70-36	2.59-35	8.53-35	3.60-34	3.10-33	
14	4.23-31	1.89-37	2.21-37	3.02-37	4.79-37	9.58-37	2.36-36	6.60-36	2.02-35	7.00-35	3.16-34	2.93-33		
13	5.35-31	2.45-37	3.04-37	4.59-37	8.16-37	1.78-36	4.64-36	1.39-35	4.90-35	2.27-34	2.17-33			
12	6.91-31	3.23-37	4.26-37	7.04-37	1.38-36	3.24-36	9.13-36	3.11-35	1.43-34	1.34-33				
11	9.16-31	4.35-37	6.10-37	1.10-36	2.35-36	6.03-36	1.91-35	6.25-35	7.15-34					
10	1.25-30	6.04-37	8.98-37	1.77-36	4.17-36	1.20-35	4.69-35	3.43-34						
9	1.78-30	8.73-37	1.39-36	3.02-36	8.11-36	2.86-35	1.71-34							
8	2.68-30	1.34-36	2.32-36	5.83-36	1.97-35	1.07-34								
7	4.32-30	2.27-36	4.47-36	1.47-35	8.66-35									
6	7.77-30	4.46-36	1.14-35	7.31-35										
5	1.66-29	1.15-35	5.72-35											
4	4.97-29	5.67-35												
3	3.61-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-6.04-36	-8.52-36	-1.18-35	-1.61-35	-2.15-35	-2.83-35	-3.66-35	-4.64-35	-5.81-35	-7.16-35	-8.73-35	-1.06-34	-1.27-34	-1.51-34
45	-9.00-36	-1.29-35	-1.82-35	-2.52-35	-3.44-35	-4.63-35	-6.13-35	-7.98-35	-1.03-34	-1.31-34	-1.65-34	-2.06-34	-2.56-34	-3.22-34
40	-1.43-35	-2.09-35	-3.02-35	-4.31-35	-6.07-35	-8.44-35	-1.16-34	-1.57-34	-2.12-34	-2.83-34	-3.77-34	-5.03-34	-6.76-34	-9.17-34
35	-2.41-35	-3.67-35	-5.53-35	-8.26-35	-1.22-34	-1.80-34	-2.64-34	-3.85-34	-5.63-34	-8.29-34	-1.24-33	-1.88-33	-2.97-33	-4.93-33
30	-4.44-35	-7.23-35	-1.17-34	-1.91-34	-3.14-34	-5.19-34	-8.73-34	-1.51-33	-2.71-33	-5.18-33	-1.10-32	-2.76-32	-9.57-32	-7.31-31
29	-5.07-35	-8.41-35	-1.40-34	-2.34-34	-3.97-34	-6.83-34	-1.21-33	-2.22-33	-4.34-33	-9.36-33	-2.39-32	-8.43-32	-6.52-31	
28	-5.81-35	-9.86-35	-1.69-34	-2.92-34	-5.14-34	-9.31-34	-1.75-33	-3.51-33	-7.74-33	-2.02-32	-7.23-32	-5.68-31		
27	-6.68-35	-1.17-34	-2.06-34	-3.71-34	-6.88-34	-1.33-33	-2.73-33	-6.16-33	-1.64-32	-6.01-32	-4.81-31			
26	-7.71-35	-1.39-34	-2.56-34	-4.86-34	-9.61-34	-2.02-33	-4.70-33	-1.28-32	-4.81-32	-3.94-31				
25	-8.96-35	-1.69-34	-3.27-34	-6.61-34	-1.43-33	-3.40-33	-9.57-33	-3.68-32	-3.09-31					
24	-1.05-34	-2.08-34	-4.31-34	-9.54-34	-2.33-33	-6.75-33	-2.67-32	-2.31-31						
23	-1.25-34	-2.65-34	-6.01-34	-1.51-33	-4.48-33	-1.83-32	-1.63-31							
22	-1.52-34	-3.54-34	-9.11-34	-2.78-33	-1.17-32	-1.07-31								
21	-1.93-34	-5.11-34	-1.60-33	-6.94-33	-6.58-32									
20	-2.59-34	-8.44-34	-3.78-33	-3.71-32										
19	-3.80-34	-1.80-33	-1.86-32											
18	-6.40-34	-7.42-33												
17	-1.12-33													

HE + TE = 5.00+04 NE = 1.00+09 CASE B NC = 24

TOTAL RC = 4.379-13 4-3 RC = 5.720-14 4-3 EM = 2.424-25 2S RC = 1.473-13 2P RC = 2.907-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.95-03	9.04-04	3.89-04	2.01-04	1.17-04	7.44-05	5.01-05	3.53-05	2.58-05	1.94-05	1.50-05	1.18-05	9.46-06	7.70-06
45	4.04-03	1.24-03	5.33-04	2.76-04	1.61-04	1.02-04	6.86-05	4.83-05	3.53-05	2.66-05	2.05-05	1.62-05	1.30-05	1.05-05
40	5.74-03	1.76-03	7.57-04	3.92-04	2.29-04	1.45-04	9.75-05	6.87-05	5.02-05	3.78-05	2.92-05	2.30-05	1.84-05	1.50-05
35	8.53-03	2.62-03	1.12-03	5.82-04	3.40-04	2.15-04	1.45-04	1.02-04	7.45-05	5.61-05	4.33-05	3.40-05	2.73-05	2.22-05
30	1.34-02	4.10-03	1.76-03	9.12-04	5.32-04	3.37-04	2.26-04	1.59-04	1.16-04	8.76-05	6.76-05	5.32-05	4.26-05	3.46-05
29	1.47-02	4.52-03	1.94-03	1.01-03	5.86-04	3.71-04	2.49-04	1.76-04	1.28-04	9.65-05	7.44-05	5.85-05	4.69-05	3.81-05
28	1.63-02	4.99-03	2.14-03	1.11-03	6.47-04	4.10-04	2.75-04	1.94-04	1.42-04	1.07-04	8.21-05	6.46-05	5.17-05	4.20-05
27	1.80-02	5.53-03	2.37-03	1.23-03	7.17-04	4.53-04	3.05-04	2.15-04	1.57-04	1.18-04	9.08-05	7.14-05	5.72-05	4.64-05
26	2.00-02	6.14-03	2.64-03	1.36-03	7.95-04	5.03-04	3.38-04	2.38-04	1.74-04	1.31-04	1.01-04	7.92-05	6.34-05	5.14-05
25	2.23-02	6.83-03	2.93-03	1.52-03	8.85-04	5.60-04	3.76-04	2.65-04	1.93-04	1.45-04	1.12-04	8.80-05	7.04-05	5.71-05
24	2.47-02	7.59-03	3.26-03	1.69-03	9.83-04	6.22-04	4.18-04	2.94-04	2.15-04	1.62-04	1.24-04	9.78-05	7.82-05	6.34-05
23	2.76-02	8.48-03	3.64-03	1.88-03	1.10-03	6.95-04	4.67-04	3.29-04	2.40-04	1.80-04	1.39-04	1.09-04	8.71-05	7.06-05
22	3.09-02	9.49-03	4.07-03	2.11-03	1.23-03	7.78-04	5.23-04	3.68-04	2.68-04	2.02-04	1.55-04	1.22-04	9.72-05	7.87-05
21	3.47-02	1.06-02	4.57-03	2.37-03	1.38-03	8.72-04	5.86-04	4.12-04	3.01-04	2.26-04	1.74-04	1.36-04	1.09-04	8.79-05
20	3.90-02	1.20-02	5.14-03	2.66-03	1.55-03	9.81-04	6.59-04	4.64-04	3.38-04	2.54-04	1.95-04	1.53-04	1.22-04	9.82-05
19	4.41-02	1.35-02	5.81-03	3.01-03	1.75-03	1.11-03	7.44-04	5.23-04	3.81-04	2.86-04	2.20-04	1.72-04	1.37-04	1.10-04
18	5.00-02	1.53-02	6.59-03	3.41-03	1.99-03	1.26-03	8.44-04	5.93-04	4.32-04	3.24-04	2.48-04	1.94-04	1.54-04	1.23-04
17	5.72-02	1.76-02	7.55-03	3.91-03	2.28-03	1.44-03	9.66-04	6.79-04	4.94-04	3.70-04	2.83-04	2.20-04	1.73-04	1.36-04
16	6.62-02	2.03-02	8.73-03	4.52-03	2.63-03	1.67-03	1.12-03	7.85-04	5.70-04	4.26-04	3.25-04	2.51-04	1.94-04	1.43-04
15	7.76-02	2.38-02	1.02-02	5.31-03	3.09-03	1.96-03	1.31-03	9.20-04	6.68-04	4.97-04	3.76-04	2.86-04	2.68-04	
14	9.24-02	2.84-02	1.22-02	6.34-03	3.70-03	2.34-03	1.57-03	1.10-03	7.93-04	5.87-04	4.37-04	3.13-04		
13	1.12-01	3.44-02	1.48-02	7.70-03	4.50-03	2.84-03	1.90-03	1.33-03	9.56-04	6.96-04	4.88-04			
12	1.38-01	4.25-02	1.84-02	9.55-03	5.58-03	3.53-03	2.36-03	1.64-03	1.16-03	7.97-04				
11	1.73-01	5.35-02	2.32-02	1.21-02	7.10-03	4.49-03	2.99-03	2.05-03	1.37-03					
10	2.22-01	6.89-02	3.01-02	1.58-02	9.27-03	5.85-03	3.85-03	2.49-03						
9	2.94-01	9.15-02	4.03-02	2.13-02	1.25-02	7.83-03	4.88-03							
8	4.06-01	1.27-01	5.68-02	3.00-02	1.75-02	1.04-02								
7	5.91-01	1.85-01	8.35-02	4.43-02	2.45-02									
6	9.30-01	2.93-01	1.32-01	6.67-02										
5	1.68+00	5.13-01	2.20-01											
4	3.42+00	1.00+00												
3	9.40+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.35-06	5.30-06	4.47-06	3.80-06	3.26-06	2.82-06	2.45-06	2.14-06	1.89-06	1.67-06	1.48-06	1.32-06	1.19-06	1.07-06
45	8.70-06	7.26-06	6.12-06	5.20-06	4.46-06	3.85-06	3.35-06	2.93-06	2.58-06	2.28-06	2.03-06	1.81-06	1.62-06	1.46-06
40	1.23-05	1.03-05	8.67-06	7.37-06	6.32-06	5.46-06	4.74-06	4.15-06	3.65-06	3.22-06	2.86-06	2.55-06	2.28-06	2.05-06
35	1.83-05	1.52-05	1.28-05	1.09-05	9.34-06	8.06-06	7.00-06	6.12-06	5.37-06	4.74-06	4.20-06	3.74-06	3.33-06	2.98-06
30	2.85-05	2.37-05	2.00-05	1.69-05	1.45-05	1.25-05	1.08-05	9.42-06	8.23-06	7.22-06	6.34-06	5.54-06	4.78-06	3.90-06
29	3.14-05	2.61-05	2.20-05	1.86-05	1.59-05	1.37-05	1.19-05	1.03-05	8.99-06	7.85-06	6.84-06	5.88-06	4.78-06	
28	3.46-05	2.88-05	2.42-05	2.05-05	1.75-05	1.51-05	1.30-05	1.13-05	9.80-06	8.50-06	7.27-06	5.88-06		
27	3.82-05	3.18-05	2.67-05	2.26-05	1.93-05	1.66-05	1.43-05	1.23-05	1.06-05	9.06-06	7.30-06			
26	4.23-05	3.52-05	2.95-05	2.50-05	2.13-05	1.82-05	1.56-05	1.34-05	1.14-05	9.11-06				
25	4.69-05	3.90-05	3.27-05	2.76-05	2.35-05	2.00-05	1.71-05	1.44-05	1.15-05					
24	5.21-05	4.32-05	3.62-05	3.05-05	2.58-05	2.19-05	1.83-05	1.45-05						
23	5.79-05	4.80-05	4.01-05	3.37-05	2.83-05	2.36-05	1.86-05							
22	6.45-05	5.33-05	4.44-05	3.70-05	3.06-05	2.39-05								
21	7.19-05	5.92-05	4.89-05	4.01-05	3.12-05									
20	8.00-05	6.54-05	5.31-05	4.10-05										
19	8.88-05	7.13-05	5.45-05											
18	9.74-05	7.37-05												
17	1.02-04													

HE + TE = 5.00+04 NE = 1.00+09 CASE B NC = 24

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	8.38-33	2.50-39	-1.28-39	-1.16-38	-3.54-38	-8.22-38	-1.65-37	-3.03-37	-5.20-37	-8.46-37	-1.32-36	-1.98-36	-2.86-36	-3.99-36
45	1.15-32	3.44-39	-1.77-39	-1.61-38	-4.92-38	-1.15-37	-2.32-37	-4.28-37	-7.39-37	-1.21-36	-1.91-36	-2.90-36	-4.24-36	-6.00-36
40	1.64-32	4.92-39	-2.51-39	-2.31-38	-7.10-38	-1.67-37	-3.40-37	-6.33-37	-1.11-36	-1.84-36	-2.94-36	-4.52-36	-6.73-36	-9.69-36
35	2.46-32	7.42-39	-3.64-39	-3.46-38	-1.07-37	-2.55-37	-5.26-37	-9.93-37	-1.76-36	-2.99-36	-4.87-36	-7.68-36	-1.17-35	-1.74-35
30	3.92-32	1.21-38	-5.14-39	-5.40-38	-1.71-37	-4.13-37	-8.69-37	-1.68-36	-3.05-36	-5.33-36	-8.98-36	-1.47-35	-2.35-35	-3.67-35
29	4.35-32	1.35-38	-5.41-39	-5.92-38	-1.89-37	-4.58-37	-9.68-37	-1.88-36	-3.45-36	-6.06-36	-1.03-35	-1.71-35	-2.77-35	-4.38-35
28	4.84-32	1.51-38	-5.63-39	-6.50-38	-2.09-37	-5.09-37	-1.08-36	-2.11-36	-3.91-36	-6.94-36	-1.19-35	-2.00-35	-3.28-35	-5.28-35
27	5.40-32	1.70-38	-5.74-39	-7.13-38	-2.31-37	-5.66-37	-1.21-36	-2.38-36	-4.45-36	-7.98-36	-1.39-35	-2.36-35	-3.94-35	-6.46-35
26	6.06-32	1.93-38	-5.67-39	-7.80-38	-2.55-37	-6.31-37	-1.36-36	-2.70-36	-5.08-36	-9.22-36	-1.63-35	-2.82-35	-4.79-35	-8.03-35
25	6.83-32	2.20-38	-5.32-39	-8.51-38	-2.82-37	-7.03-37	-1.53-36	-3.06-36	-5.82-36	-1.07-35	-1.92-35	-3.39-35	-5.89-35	-1.01-34
24	7.73-32	2.54-38	-4.03-39	-9.07-38	-3.07-37	-7.73-37	-1.70-36	-3.44-36	-6.63-36	-1.24-35	-2.27-35	-4.09-35	-7.30-35	-1.30-34
23	8.81-32	2.95-38	-2.37-39	-9.71-38	-3.36-37	-8.56-37	-1.90-36	-3.89-36	-7.63-36	-1.45-35	-2.72-35	-5.03-35	-9.28-35	-1.72-34
22	1.01-31	3.46-38	3.49-40	-1.03-37	-3.65-37	-9.43-37	-2.12-36	-4.41-36	-8.79-36	-1.71-35	-3.28-35	-6.27-35	-1.20-34	-2.35-34
21	1.16-31	4.10-38	4.61-39	-1.06-37	-3.92-37	-1.03-36	-2.35-36	-4.98-36	-1.01-35	-2.02-35	-4.00-35	-7.96-35	-1.61-34	-3.34-34
20	1.35-31	4.90-38	1.10-38	-1.06-37	-4.15-37	-1.12-36	-2.59-36	-5.59-36	-1.17-35	-2.40-35	-4.94-35	-1.03-34	-2.23-34	-5.05-34
19	1.58-31	5.92-38	2.04-38	-1.02-37	-4.31-37	-1.19-36	-2.82-36	-6.23-36	-1.34-35	-2.86-35	-6.19-35	-1.38-34	-3.25-34	-8.36-34
18	1.87-31	7.23-38	3.37-38	-9.14-38	-4.36-37	-1.25-36	-3.04-36	-6.90-36	-1.54-35	-3.45-35	-7.94-35	-1.93-34	-5.16-34	-1.61-33
17	2.23-31	8.92-38	5.21-38	-7.28-38	-4.29-37	-1.29-36	-3.23-36	-7.60-36	-1.77-35	-4.22-35	-1.06-34	-2.92-34	-9.45-34	-4.16-33
16	2.70-31	1.11-37	7.72-38	-4.44-38	-4.07-37	-1.31-36	-3.41-36	-8.37-36	-2.06-35	-5.35-35	-1.52-34	-5.07-34	-2.31-33	-2.30-32
15	3.30-31	1.40-37	1.11-37	-3.27-39	-3.67-37	-1.31-36	-3.59-36	-9.27-36	-2.47-35	-7.23-35	-2.48-34	-1.17-33	-1.20-32	
14	4.10-31	1.79-37	1.59-37	5.73-38	-3.00-37	-1.27-36	-3.73-36	-1.04-35	-3.09-35	-1.09-34	-5.29-34	-5.62-33		
13	5.19-31	2.33-37	2.27-37	1.52-37	-1.75-37	-1.12-36	-3.67-36	-1.13-35	-4.03-35	-2.01-34	-2.22-33			
12	6.71-31	3.11-37	3.31-37	3.11-37	8.00-38	-6.78-37	-2.78-36	-9.83-36	-4.80-35	-5.59-34				
11	8.89-31	4.27-37	4.98-37	6.00-37	6.82-37	6.61-37	1.56-36	1.02-35	1.19-34					
10	1.22-30	6.06-37	7.81-37	1.16-36	1.98-36	4.97-36	2.38-35	2.79-34						
9	1.73-30	8.99-37	1.29-36	2.36-36	5.62-36	2.20-35	2.32-34							
8	2.60-30	1.41-36	2.29-36	5.26-36	1.83-35	1.54-34								
7	4.19-30	2.39-36	4.59-36	1.45-35	1.01-34									
6	7.53-30	4.65-36	1.16-35	7.18-35										
5	1.61-29	1.18-35	5.55-35											
4	4.82-29	5.70-35												
3	3.50-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.36-36	-6.94-36	-8.68-36	-1.09-35	-1.24-35	-1.44-35	-1.64-35	-1.84-35	-2.06-35	-2.24-35	-2.48-35	-2.74-35	-3.03-35	-3.35-35
45	-8.17-36	-1.07-35	-1.37-35	-1.69-35	-2.08-35	-2.41-35	-2.81-35	-3.25-35	-3.74-35	-4.21-35	-4.83-35	-5.55-35	-6.41-35	-7.45-35
40	-1.35-35	-1.82-35	-2.37-35	-3.01-35	-3.74-35	-4.58-35	-5.56-35	-6.71-35	-8.08-35	-9.60-35	-1.17-34	-1.43-34	-1.79-34	-2.26-34
35	-2.50-35	-3.49-35	-4.75-35	-6.31-35	-8.26-35	-1.07-34	-1.39-34	-1.80-34	-2.36-34	-3.10-34	-4.23-34	-5.96-34	-8.78-34	-1.37-33
30	-5.59-35	-8.32-35	-1.22-34	-1.76-34	-2.54-34	-3.70-34	-5.48-34	-8.41-34	-1.36-33	-2.32-33	-4.51-33	-1.05-32	-3.43-32	-2.48-31
29	-6.77-35	-1.03-34	-1.54-34	-2.28-34	-3.40-34	-5.14-34	-8.01-34	-1.31-33	-2.29-33	-4.42-33	-1.04-32	-3.40-32	-2.48-31	
28	-8.34-35	-1.29-34	-1.99-34	-3.04-34	-4.71-34	-7.48-34	-1.24-33	-2.20-33	-4.36-33	-1.02-32	-3.35-32	-2.44-31		
27	-1.04-34	-1.66-34	-2.63-34	-4.20-34	-6.82-34	-1.15-33	-2.08-33	-4.16-33	-9.95-33	-3.26-32	-2.40-31			
26	-1.33-34	-2.19-34	-3.61-34	-6.03-34	-1.04-33	-1.92-33	-3.90-33	-9.44-33	-3.16-32	-2.32-31				
25	-1.74-34	-2.97-34	-5.15-34	-9.17-34	-1.73-33	-3.58-33	-8.79-33	-2.97-32	-2.19-31					
24	-2.31-34	-4.16-34	-7.66-34	-1.40-33	-3.15-33	-7.88-33	-2.71-32	-2.04-31						
23	-3.21-34	-6.16-34	-1.20-33	-2.71-33	-6.94-33	-2.43-32	-1.87-31							
22	-4.68-34	-9.78-34	-2.22-33	-5.87-33	-2.11-32	-1.66-31								
21	-7.28-34	-1.72-33	-4.72-33	-1.76-32	-1.41-31									
20	-1.25-33	-3.57-33	-1.38-32	-1.15-31										
19	-2.50-33	-1.01-32	-8.74-32											
18	-6.79-33	-6.16-32												
17	-3.96-32													

HE + TE = 5.00+04 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 4.463-13 4-3 RC = 5.574-14 4-3 EM = 2.362-25 2S RC = 1.508-13 2P RC = 2.955-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.03-03	9.30-04	4.00-04	2.07-04	1.21-04	7.65-05	5.15-05	3.63-05	2.65-05	2.00-05	1.54-05	1.21-05	9.73-06	7.92-06
45	4.16-03	1.28-03	5.48-04	2.84-04	1.66-04	1.05-04	7.06-05	4.98-05	3.64-05	2.74-05	2.11-05	1.66-05	1.33-05	1.09-05
40	5.93-03	1.82-03	7.81-04	4.05-04	2.36-04	1.50-04	1.01-04	7.09-05	5.18-05	3.90-05	3.01-05	2.37-05	1.90-05	1.54-05
35	8.86-03	2.72-03	1.17-03	6.04-04	3.53-04	2.23-04	1.50-04	1.06-04	7.73-05	5.82-05	4.49-05	3.53-05	2.83-05	2.30-05
30	1.41-02	4.31-03	1.85-03	9.59-04	5.59-04	3.54-04	2.38-04	1.68-04	1.22-04	9.22-05	7.10-05	5.59-05	4.48-05	3.64-05
29	1.56-02	4.77-03	2.05-03	1.06-03	6.19-04	3.92-04	2.63-04	1.85-04	1.35-04	1.02-04	7.86-05	6.18-05	4.95-05	4.02-05
28	1.73-02	5.30-03	2.28-03	1.18-03	6.87-04	4.35-04	2.92-04	2.06-04	1.50-04	1.13-04	8.72-05	6.86-05	5.49-05	4.46-05
27	1.93-02	5.91-03	2.54-03	1.31-03	7.65-04	4.84-04	3.26-04	2.29-04	1.67-04	1.26-04	9.70-05	7.63-05	6.11-05	4.96-05
26	2.15-02	6.60-03	2.84-03	1.47-03	8.56-04	5.42-04	3.64-04	2.56-04	1.87-04	1.41-04	1.08-04	8.52-05	6.82-05	5.54-05
25	2.42-02	7.42-03	3.19-03	1.65-03	9.61-04	6.08-04	4.09-04	2.88-04	2.10-04	1.58-04	1.22-04	9.56-05	7.64-05	6.20-05
24	2.73-02	8.36-03	3.59-03	1.86-03	1.08-03	6.85-04	4.60-04	3.24-04	2.36-04	1.78-04	1.37-04	1.08-04	8.60-05	6.97-05
23	3.09-02	9.47-03	4.07-03	2.10-03	1.23-03	7.75-04	5.21-04	3.67-04	2.67-04	2.01-04	1.55-04	1.21-04	9.71-05	7.87-05
22	3.51-02	1.08-02	4.62-03	2.39-03	1.39-03	8.81-04	5.92-04	4.16-04	3.04-04	2.28-04	1.76-04	1.38-04	1.10-04	8.90-05
21	4.01-02	1.23-02	5.28-03	2.73-03	1.59-03	1.01-03	6.76-04	4.75-04	3.46-04	2.60-04	2.00-04	1.57-04	1.25-04	1.01-04
20	4.60-02	1.41-02	6.05-03	3.13-03	1.82-03	1.15-03	7.74-04	5.44-04	3.96-04	2.97-04	2.29-04	1.79-04	1.43-04	1.15-04
19	5.30-02	1.62-02	6.97-03	3.60-03	2.10-03	1.33-03	8.90-04	6.26-04	4.56-04	3.42-04	2.62-04	2.05-04	1.63-04	1.31-04
18	6.13-02	1.88-02	8.06-03	4.17-03	2.43-03	1.53-03	1.03-03	7.22-04	5.26-04	3.94-04	3.02-04	2.35-04	1.86-04	1.49-04
17	7.11-02	2.18-02	9.35-03	4.83-03	2.81-03	1.78-03	1.19-03	8.36-04	6.08-04	4.55-04	3.48-04	2.70-04	2.12-04	1.66-04
16	8.28-02	2.54-02	1.09-02	5.62-03	3.27-03	2.07-03	1.38-03	9.70-04	7.04-04	5.26-04	4.00-04	3.09-04	2.38-04	1.76-04
15	9.68-02	2.96-02	1.27-02	6.57-03	3.82-03	2.41-03	1.61-03	1.13-03	8.18-04	6.08-04	4.59-04	3.49-04	2.53-04	
14	1.14-01	3.48-02	1.49-02	7.70-03	4.48-03	2.82-03	1.89-03	1.32-03	9.51-04	7.01-04	5.21-04	3.72-04		
13	1.34-01	4.12-02	1.76-02	9.11-03	5.29-03	3.33-03	2.22-03	1.55-03	1.11-03	8.04-04	5.63-04			
12	1.62-01	4.95-02	2.12-02	1.09-02	6.35-03	3.99-03	2.65-03	1.83-03	1.29-03	8.83-04				
11	1.99-01	6.10-02	2.62-02	1.35-02	7.81-03	4.89-03	3.23-03	2.20-03	1.46-03					
10	2.54-01	7.76-02	3.33-02	1.71-02	9.91-03	6.17-03	4.01-03	2.57-03						
9	3.34-01	1.02-01	4.39-02	2.26-02	1.30-02	7.97-03	4.89-03							
8	4.58-01	1.40-01	6.02-02	3.09-02	1.76-02	1.02-02								
7	6.61-01	2.02-01	8.68-02	4.43-02	2.39-02									
6	1.03+00	3.11-01	1.33-01	6.49-02										
5	1.78+00	5.26-01	2.16-01											
4	3.61+00	1.00+00												
3	9.71+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.53-06	5.45-06	4.59-06	3.91-06	3.35-06	2.89-06	2.52-06	2.20-06	1.94-06	1.72-06	1.52-06	1.36-06	1.22-06	1.10-06
45	8.95-06	7.47-06	6.29-06	5.35-06	4.59-06	3.97-06	3.45-06	3.02-06	2.65-06	2.35-06	2.09-06	1.86-06	1.67-06	1.50-06
40	1.27-05	1.06-05	8.95-06	7.61-06	6.52-06	5.63-06	4.90-06	4.28-06	3.77-06	3.33-06	2.95-06	2.63-06	2.36-06	2.12-06
35	1.90-05	1.58-05	1.33-05	1.13-05	9.70-06	8.37-06	7.27-06	6.35-06	5.57-06	4.92-06	4.36-06	3.88-06	3.46-06	3.09-06
30	3.00-05	2.50-05	2.10-05	1.78-05	1.52-05	1.31-05	1.14-05	9.90-06	8.66-06	7.59-06	6.66-06	5.83-06	5.03-06	4.10-06
29	3.31-05	2.76-05	2.32-05	1.97-05	1.68-05	1.45-05	1.25-05	1.09-05	9.50-06	8.29-06	7.22-06	6.21-06	5.04-06	
28	3.67-05	3.05-05	2.57-05	2.18-05	1.86-05	1.60-05	1.38-05	1.20-05	1.04-05	9.02-06	7.72-06	6.25-06		
27	4.08-05	3.40-05	2.85-05	2.42-05	2.06-05	1.77-05	1.53-05	1.32-05	1.14-05	9.68-06	7.80-06			
26	4.55-05	3.79-05	3.18-05	2.69-05	2.29-05	1.96-05	1.68-05	1.44-05	1.22-05	9.81-06				
25	5.10-05	4.23-05	3.55-05	3.00-05	2.55-05	2.17-05	1.85-05	1.56-05	1.25-05					
24	5.73-05	4.75-05	3.98-05	3.35-05	2.84-05	2.40-05	2.01-05	1.60-05						
23	6.45-05	5.35-05	4.47-05	3.75-05	3.15-05	2.62-05	2.06-05							
22	7.29-05	6.03-05	5.01-05	4.18-05	3.45-05	2.70-05								
21	8.26-05	6.80-05	5.61-05	4.60-05	3.57-05									
20	9.36-05	7.65-05	6.21-05	4.78-05										
19	1.06-04	8.49-05	6.49-05											
18	1.18-04	8.91-05												
17	1.24-04													

HE + TE = 5.00+04 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	6.35-33	2.33-39	-2.03-39	-1.36-38	-3.88-38	-8.59-38	-1.67-37	-2.96-37	-4.85-37	-7.41-37	-1.05-36	-1.37-36	-1.68-36	-1.93-36
45	8.72-33	3.20-39	-2.82-39	-1.89-38	-5.41-38	-1.20-37	-2.35-37	-4.19-37	-6.94-37	-1.07-36	-1.53-36	-2.02-36	-2.50-36	-2.93-36
40	1.24-32	4.57-39	-4.09-39	-2.74-38	-7.86-38	-1.76-37	-3.47-37	-6.25-37	-1.05-36	-1.63-36	-2.37-36	-3.19-36	-4.03-36	-4.80-36
35	1.86-32	6.84-39	-6.24-39	-4.18-38	-1.21-37	-2.74-37	-5.46-37	-9.98-37	-1.70-36	-2.70-36	-4.00-36	-5.52-36	-7.16-36	-8.83-36
30	2.97-32	1.09-38	-1.02-38	-6.85-38	-2.01-37	-4.62-37	-9.39-37	-1.75-36	-3.07-36	-5.03-36	-7.72-36	-1.11-35	-1.51-35	-1.96-35
29	3.29-32	1.21-38	-1.13-38	-7.64-38	-2.25-37	-5.19-37	-1.06-36	-1.99-36	-3.51-36	-5.80-36	-9.00-36	-1.31-35	-1.80-35	-2.38-35
28	3.66-32	1.35-38	-1.26-38	-8.55-38	-2.52-37	-5.86-37	-1.20-36	-2.28-36	-4.05-36	-6.76-36	-1.06-35	-1.56-35	-2.18-35	-2.92-35
27	4.09-32	1.51-38	-1.41-38	-9.61-38	-2.85-37	-6.65-37	-1.38-36	-2.63-36	-4.70-36	-7.93-36	-1.26-35	-1.88-35	-2.67-35	-3.66-35
26	4.59-32	1.70-38	-1.59-38	-1.08-37	-3.23-37	-7.59-37	-1.58-36	-3.05-36	-5.51-36	-9.41-36	-1.52-35	-2.30-35	-3.33-35	-4.68-35
25	5.17-32	1.92-38	-1.78-38	-1.23-37	-3.68-37	-8.71-37	-1.83-36	-3.56-36	-6.52-36	-1.13-35	-1.85-35	-2.86-35	-4.24-35	-6.12-35
24	5.86-32	2.19-38	-2.01-38	-1.40-37	-4.22-37	-1.01-36	-2.14-36	-4.20-36	-7.80-36	-1.37-35	-2.29-35	-3.63-35	-5.53-35	-8.24-35
23	6.67-32	2.51-38	-2.27-38	-1.60-37	-4.87-37	-1.17-36	-2.51-36	-5.01-36	-9.44-36	-1.69-35	-2.89-35	-4.71-35	-7.41-35	-1.15-34
22	7.65-32	2.89-38	-2.55-38	-1.84-37	-5.64-37	-1.37-36	-2.98-36	-6.03-36	-1.16-35	-2.13-35	-3.73-35	-6.27-35	-1.03-34	-1.67-34
21	8.82-32	3.37-38	-2.86-38	-2.12-37	-6.57-37	-1.62-36	-3.56-36	-7.35-36	-1.44-35	-2.72-35	-4.93-35	-8.63-35	-1.49-34	-2.58-34
20	1.02-31	3.98-38	-3.14-38	-2.43-37	-7.66-37	-1.91-36	-4.29-36	-9.04-36	-1.82-35	-3.55-35	-6.69-35	-1.23-34	-2.26-34	-4.29-34
19	1.20-31	4.70-38	-3.43-38	-2.81-37	-8.99-37	-2.28-36	-5.23-36	-1.13-35	-2.35-35	-4.77-35	-9.45-35	-1.86-34	-3.72-34	-7.99-34
18	1.42-31	5.74-38	-3.62-38	-3.24-37	-1.06-36	-2.74-36	-6.43-36	-1.44-35	-3.11-35	-6.63-35	-1.40-34	-3.01-34	-6.84-34	-1.78-33
17	1.69-31	7.06-38	-3.59-38	-3.70-37	-1.24-36	-3.30-36	-7.99-36	-1.85-35	-4.22-35	-9.62-35	-2.23-34	-5.41-34	-1.49-33	-5.45-33
16	2.04-31	8.85-38	-3.15-38	-4.18-37	-1.45-36	-3.98-36	-1.00-35	-2.44-35	-5.93-35	-1.48-34	-3.88-34	-1.15-33	-4.45-33	-3.65-32
15	2.50-31	1.13-37	-1.94-38	-4.61-37	-1.69-36	-4.80-36	-1.26-35	-3.28-35	-8.73-35	-2.47-34	-7.89-34	-3.29-33	-2.87-32	
14	3.11-31	1.48-37	5.47-39	-4.90-37	-1.92-36	-5.75-36	-1.61-35	-4.56-35	-1.38-34	-4.74-34	-2.14-33	-2.02-32		
13	3.93-31	1.99-37	5.05-38	-4.95-37	-2.15-36	-6.87-36	-2.09-35	-6.69-35	-2.45-34	-1.19-33	-1.22-32			
12	5.08-31	2.72-37	1.25-37	-4.64-37	-2.30-36	-8.31-36	-2.84-35	-1.10-34	-5.66-34	-6.24-33				
11	6.73-31	3.81-37	2.46-37	-3.86-37	-2.69-36	-1.05-35	-4.31-35	-2.32-34	-2.68-33					
10	9.21-31	5.50-37	4.47-37	-2.23-37	-3.02-36	-1.47-35	-8.36-35	-9.97-34						
9	1.31-30	8.29-37	8.15-37	4.72-37	-3.41-36	-2.43-35	-3.00-34							
8	1.97-30	1.33-36	1.58-36	1.37-36	-2.37-36	-4.78-35								
7	3.18-30	2.34-36	3.48-36	6.21-36	2.57-35									
6	5.71-30	4.71-36	9.69-36	4.54-35										
5	1.22-29	1.21-35	4.92-35											
4	3.65-29	5.74-35												
3	2.65-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-2.12-36	-2.25-36	-2.31-36	-2.30-36	-2.22-36	-2.01-36	-1.78-36	-1.45-36	-1.02-36	-0.55-37	2.81-37	1.22-36	2.43-36	3.99-36
45	-3.27-36	-3.53-36	-3.70-36	-3.78-36	-3.77-36	-3.55-36	-3.31-36	-2.92-36	-2.35-36	-1.55-36	-4.13-37	1.14-36	3.28-36	6.23-36
40	-5.49-36	-6.09-36	-6.59-36	-6.98-36	-7.27-36	-7.25-36	-7.24-36	-7.01-36	-6.49-36	-5.53-36	-3.90-36	-1.30-36	2.86-36	9.46-36
35	-1.05-35	-1.21-35	-1.38-35	-1.55-35	-1.72-35	-1.86-35	-2.00-35	-2.24-35	-2.44-35	-2.62-35	-2.73-35	-2.69-35	-2.24-35	-6.55-36
30	-2.48-35	-3.08-35	-3.79-35	-4.69-35	-5.86-35	-7.30-35	-9.52-35	-1.28-34	-1.82-34	-2.77-34	-4.68-34	-9.38-34	-2.56-33	-1.52-32
29	-3.06-35	-3.87-35	-4.90-35	-6.23-35	-8.06-35	-1.05-34	-1.44-34	-2.09-34	-3.26-34	-5.68-34	-1.18-33	-3.38-33	-2.12-32	
28	-3.84-35	-4.98-35	-6.48-35	-8.53-35	-1.15-34	-1.58-34	-2.33-34	-3.70-34	-6.57-34	-1.40-33	-4.12-33	-2.70-32		
27	-4.92-35	-6.57-35	-8.83-35	-1.21-34	-1.72-34	-2.53-34	-4.09-34	-7.37-34	-1.59-33	-4.80-33	-3.20-32			
26	-6.46-35	-8.91-35	-1.25-34	-1.81-34	-2.74-34	-4.41-34	-8.07-34	-1.77-33	-5.42-33	-3.69-32				
25	-8.73-35	-1.26-34	-1.85-34	-2.86-34	-4.74-34	-8.64-34	-1.92-33	-5.94-33	-4.09-32					
24	-1.22-34	-1.85-34	-2.91-34	-4.91-34	-9.22-34	-2.04-33	-6.40-33	-4.45-32						
23	-1.79-34	-2.90-34	-4.98-34	-9.49-34	-2.16-33	-6.75-33	-4.76-32							
22	-2.79-34	-4.91-34	-9.55-34	-2.21-33	-7.07-33	-4.96-32								
21	-4.70-34	-9.37-34	-2.21-33	-7.16-33	-5.10-32									
20	-8.81-34	-2.12-33	-7.01-33	-5.09-32										
19	-1.99-33	-6.74-33	-4.99-32											
18	-6.22-33	-4.72-32												
17	-4.28-32													

HE + TE = 5.00+04 NE = 1.00+11 CASE B NC = 20

TOTAL RC = 4.621-13 4-3 RC = 5.611-14 4-3 EM = 2.378-25 2S RC = 1.519-13 2P RC = 3.102-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.01-03	9.24-04	3.97-04	2.06-04	1.20-04	7.60-05	5.11-05	3.60-05	2.63-05	1.98-05	1.53-05	1.21-05	9.67-06	7.87-06
45	4.13-03	1.27-03	5.45-04	2.82-04	1.65-04	1.04-04	7.02-05	4.95-05	3.62-05	2.72-05	2.10-05	1.65-05	1.33-05	1.08-05
40	5.89-03	1.81-03	7.77-04	4.02-04	2.35-04	1.49-04	1.00-04	7.05-05	5.15-05	3.88-05	2.99-05	2.36-05	1.89-05	1.54-05
35	8.82-03	2.70-03	1.16-03	6.02-04	3.51-04	2.22-04	1.49-04	1.05-04	7.69-05	5.79-05	4.47-05	3.52-05	2.82-05	2.29-05
30	1.40-02	4.31-03	1.85-03	9.58-04	5.58-04	3.53-04	2.38-04	1.67-04	1.22-04	9.20-05	7.09-05	5.58-05	4.47-05	3.63-05
29	1.56-02	4.77-03	2.05-03	1.06-03	6.18-04	3.91-04	2.63-04	1.85-04	1.35-04	1.02-04	7.85-05	6.18-05	4.95-05	4.02-05
28	1.73-02	5.30-03	2.28-03	1.18-03	6.87-04	4.35-04	2.93-04	2.06-04	1.50-04	1.13-04	8.72-05	6.86-05	5.49-05	4.46-05
27	1.93-02	5.92-03	2.54-03	1.32-03	7.67-04	4.85-04	3.26-04	2.30-04	1.68-04	1.26-04	9.73-05	7.65-05	6.12-05	4.97-05
26	2.16-02	6.63-03	2.85-03	1.47-03	8.59-04	5.44-04	3.66-04	2.57-04	1.88-04	1.41-04	1.09-04	8.56-05	6.85-05	5.56-05
25	2.44-02	7.47-03	3.21-03	1.66-03	9.67-04	6.12-04	4.11-04	2.90-04	2.11-04	1.59-04	1.22-04	9.62-05	7.69-05	6.24-05
24	2.75-02	8.45-03	3.63-03	1.88-03	1.09-03	6.92-04	4.65-04	3.27-04	2.39-04	1.80-04	1.38-04	1.09-04	8.68-05	7.04-05
23	3.13-02	9.60-03	4.12-03	2.13-03	1.24-03	7.86-04	5.28-04	3.72-04	2.71-04	2.04-04	1.57-04	1.23-04	9.84-05	7.98-05
22	3.58-02	1.10-02	4.71-03	2.44-03	1.42-03	8.98-04	6.03-04	4.25-04	3.10-04	2.33-04	1.79-04	1.40-04	1.12-04	9.08-05
21	4.12-02	1.26-02	5.42-03	2.80-03	1.63-03	1.03-03	6.93-04	4.88-04	3.56-04	2.67-04	2.05-04	1.61-04	1.28-04	1.04-04
20	4.77-02	1.46-02	6.27-03	3.24-03	1.89-03	1.19-03	8.02-04	5.64-04	4.11-04	3.08-04	2.37-04	1.85-04	1.48-04	1.19-04
19	5.56-02	1.70-02	7.31-03	3.78-03	2.20-03	1.39-03	9.33-04	6.56-04	4.78-04	3.58-04	2.75-04	2.15-04	1.71-04	1.37-04
18	6.53-02	2.00-02	8.58-03	4.44-03	2.58-03	1.63-03	1.09-03	7.68-04	5.59-04	4.19-04	3.21-04	2.50-04	1.98-04	1.58-04
17	7.73-02	2.37-02	1.02-02	5.25-03	3.05-03	1.93-03	1.29-03	9.07-04	6.59-04	4.93-04	3.77-04	2.93-04	2.30-04	1.80-04
16	9.22-02	2.82-02	1.21-02	6.25-03	3.64-03	2.30-03	1.54-03	1.08-03	7.82-04	5.83-04	4.44-04	3.43-04	2.64-04	1.95-04
15	1.11-01	3.40-02	1.46-02	7.52-03	4.37-03	2.75-03	1.84-03	1.29-03	9.34-04	6.94-04	5.24-04	3.97-04	2.89-04	
14	1.34-01	4.12-02	1.76-02	9.10-03	5.28-03	3.33-03	2.22-03	1.55-03	1.12-03	8.25-04	6.13-04	4.37-04		
13	1.64-01	5.02-02	2.15-02	1.11-02	6.43-03	4.04-03	2.69-03	1.87-03	1.34-03	9.72-04	6.79-04			
12	2.01-01	6.15-02	2.63-02	1.36-02	7.86-03	4.93-03	3.27-03	2.26-03	1.59-03	1.08-03				
11	2.48-01	7.57-02	3.24-02	1.66-02	9.62-03	6.01-03	3.96-03	2.69-03	1.78-03					
10	3.07-01	9.37-02	4.00-02	2.05-02	1.18-02	7.34-03	4.76-03	3.04-03						
9	3.88-01	1.18-01	5.04-02	2.58-02	1.47-02	9.00-03	5.49-03							
8	5.13-01	1.56-01	6.63-02	3.37-02	1.90-02	1.09-02								
7	7.22-01	2.19-01	9.25-02	4.63-02	2.46-02									
6	1.10+00	3.31-01	1.38-01	6.53-02										
5	1.87+00	5.49-01	2.16-01											
4	3.79+00	1.00+00												
3	9.93+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	6.49-06	5.41-06	4.56-06	3.88-06	3.33-06	2.88-06	2.50-06	2.19-06	1.93-06	1.70-06	1.52-06	1.35-06	1.21-06	1.09-06
45	8.90-06	7.42-06	6.26-06	5.32-06	4.56-06	3.94-06	3.43-06	3.00-06	2.64-06	2.33-06	2.07-06	1.85-06	1.66-06	1.49-06
40	1.27-05	1.06-05	8.90-06	7.57-06	6.49-06	5.60-06	4.87-06	4.26-06	3.74-06	3.31-06	2.94-06	2.62-06	2.34-06	2.10-06
35	1.89-05	1.57-05	1.33-05	1.13-05	9.65-06	8.33-06	7.23-06	6.32-06	5.55-06	4.90-06	4.34-06	3.86-06	3.44-06	3.08-06
30	2.99-05	2.49-05	2.10-05	1.78-05	1.52-05	1.31-05	1.14-05	9.89-06	8.64-06	7.58-06	6.65-06	5.82-06	5.02-06	4.10-06
29	3.31-05	2.76-05	2.32-05	1.97-05	1.68-05	1.45-05	1.25-05	1.09-05	9.49-06	8.29-06	7.22-06	6.21-06	5.04-06	
28	3.67-05	3.06-05	2.57-05	2.18-05	1.86-05	1.60-05	1.38-05	1.20-05	1.04-05	9.03-06	7.73-06	6.25-06		
27	4.09-05	3.40-05	2.86-05	2.42-05	2.07-05	1.77-05	1.53-05	1.32-05	1.14-05	9.70-06	7.81-06			
26	4.57-05	3.80-05	3.19-05	2.70-05	2.30-05	1.97-05	1.69-05	1.45-05	1.23-05	9.85-06				
25	5.13-05	4.26-05	3.57-05	3.02-05	2.57-05	2.19-05	1.87-05	1.57-05	1.25-05					
24	5.78-05	4.80-05	4.02-05	3.39-05	2.87-05	2.43-05	2.03-05	1.61-05						
23	6.54-05	5.42-05	4.53-05	3.80-05	3.19-05	2.66-05	2.09-05							
22	7.43-05	6.14-05	5.11-05	4.26-05	3.52-05	2.75-05								
21	8.48-05	6.98-05	5.76-05	4.72-05	3.67-05									
20	9.69-05	7.92-05	6.43-05	4.95-05										
19	1.11-04	8.89-05	6.79-05											
18	1.25-04	9.47-05												
17	1.34-04													

HE + TE = 5.00+04 NE = 1.00+11 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.85-33	1.56-39	-3.23-39	-1.43-38	-3.68-38	-7.68-38	-1.37-37	-2.10-37	-2.71-37	-3.00-37	-2.88-37	-2.36-37	-1.45-37	-1.66-38
45	2.54-33	2.14-39	-4.49-39	-1.99-38	-5.14-38	-1.08-37	-1.94-37	-2.98-37	-3.88-37	-4.35-37	-4.25-37	-3.57-37	-2.32-37	-5.01-38
40	3.62-33	3.04-39	-6.49-39	-2.88-38	-7.48-38	-1.58-37	-2.87-37	-4.46-37	-5.89-37	-6.71-37	-6.71-37	-5.83-37	-4.07-37	-1.37-37
35	5.42-33	4.54-39	-9.90-39	-4.41-38	-1.16-37	-2.47-37	-4.54-37	-7.17-37	-9.65-37	-1.13-36	-1.16-36	-1.06-36	-8.11-37	-3.93-37
30	8.64-33	7.22-39	-1.62-38	-7.29-38	-1.93-37	-4.20-37	-7.88-37	-1.28-36	-1.77-36	-2.15-36	-2.34-36	-2.29-36	-1.97-36	-1.32-36
29	9.58-33	8.00-39	-1.81-38	-8.15-38	-2.17-37	-4.73-37	-8.93-37	-1.46-36	-2.04-36	-2.50-36	-2.75-36	-2.75-36	-2.44-36	-1.73-36
28	1.07-32	8.89-39	-2.03-38	-9.15-38	-2.45-37	-5.36-37	-1.02-36	-1.67-36	-2.37-36	-2.93-36	-3.28-36	-3.34-36	-3.06-36	-2.31-36
27	1.19-32	9.92-39	-2.29-38	-1.03-37	-2.77-37	-6.12-37	-1.17-36	-1.94-36	-2.77-36	-3.48-36	-3.95-36	-4.12-36	-3.90-36	-3.15-36
26	1.33-32	1.11-38	-2.59-38	-1.17-37	-3.16-37	-7.02-37	-1.35-36	-2.26-36	-3.27-36	-4.17-36	-4.83-36	-5.17-36	-5.07-36	-4.36-36
25	1.50-32	1.25-38	-2.95-38	-1.34-37	-3.63-37	-8.12-37	-1.58-36	-2.67-36	-3.91-36	-5.07-36	-6.00-36	-6.60-36	-6.75-36	-6.20-36
24	1.70-32	1.42-38	-3.38-38	-1.54-37	-4.20-37	-9.47-37	-1.86-36	-3.18-36	-4.74-36	-6.26-36	-7.59-36	-8.62-36	-9.21-36	-9.00-36
23	1.94-32	1.61-38	-3.90-38	-1.78-37	-4.90-37	-1.11-36	-2.21-36	-3.84-36	-5.82-36	-7.87-36	-9.81-36	-1.16-35	-1.30-35	-1.38-35
22	2.22-32	1.85-38	-4.52-38	-2.08-37	-5.76-37	-1.32-36	-2.67-36	-4.71-36	-7.28-36	-1.01-35	-1.30-35	-1.60-35	-1.90-35	-2.19-35
21	2.56-32	2.13-38	-5.29-38	-2.44-37	-6.84-37	-1.59-36	-3.26-36	-5.86-36	-9.28-36	-1.33-35	-1.78-35	-2.29-35	-2.92-35	-3.71-35
20	2.98-32	2.48-38	-6.22-38	-2.90-37	-8.20-37	-1.94-36	-4.04-36	-7.44-36	-1.21-35	-1.80-35	-2.52-35	-3.45-35	-4.75-35	-6.75-35
19	3.49-32	2.92-38	-7.39-38	-3.47-37	-9.97-37	-2.40-36	-5.11-36	-9.66-36	-1.63-35	-2.52-35	-3.74-35	-5.53-35	-8.45-35	-1.39-34
18	4.12-32	3.47-38	-8.85-38	-4.21-37	-1.23-36	-3.02-36	-6.59-36	-1.29-35	-2.27-35	-3.71-35	-5.91-35	-9.63-35	-1.69-34	-3.46-34
17	4.92-32	4.18-38	-1.07-37	-5.16-37	-1.54-36	-3.87-36	-8.74-36	-1.78-35	-3.30-35	-5.79-35	-1.01-34	-1.89-34	-4.08-34	-1.20-33
16	5.95-32	5.12-38	-1.30-37	-6.41-37	-1.95-36	-5.07-36	-1.19-35	-2.56-35	-5.09-35	-9.78-35	-1.95-34	-4.45-34	-1.37-33	-9.20-33
15	7.28-32	6.40-38	-1.59-37	-8.05-37	-2.53-36	-6.83-36	-1.69-35	-3.88-35	-8.46-35	-1.85-34	-4.51-34	-1.46-33	-1.02-32	
14	9.04-32	8.24-38	-1.93-37	-1.02-36	-3.34-36	-9.47-36	-2.51-35	-6.32-35	-1.57-34	-4.18-34	-1.45-33	-1.06-32		
13	1.14-31	1.10-37	-2.33-37	-1.31-36	-4.49-36	-1.36-35	-3.94-35	-1.13-34	-3.43-34	-1.30-33	-1.02-32			
12	1.48-31	1.53-37	-2.71-37	-1.67-36	-6.13-36	-2.08-35	-6.73-35	-2.36-34	-1.02-33	-8.74-33				
11	1.96-31	2.24-37	-2.91-37	-2.11-36	-8.51-36	-3.21-35	-1.30-34	-6.53-34	-6.41-33					
10	2.68-31	3.45-37	-2.58-37	-2.59-36	-1.20-35	-5.53-35	-3.20-34	-3.69-33						
9	3.81-31	5.59-37	-1.14-37	-3.07-36	-1.78-35	-1.17-34	-1.54-33							
8	5.72-31	9.51-37	2.39-37	-3.69-36	-3.20-35	-4.74-34								
7	9.24-31	1.75-36	1.13-36	-4.93-36	-1.10-34									
6	1.66-30	3.69-36	4.23-36	-7.29-36										
5	3.55-30	1.01-35	2.42-35											
4	1.06-29	4.96-35												
3	7.70-29													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.52-37	3.63-37	6.28-37	9.81-37	1.33-36	1.81-36	2.39-36	3.09-36	3.94-36	4.99-36	6.27-36	7.85-36	9.81-36	1.23-35
45	1.94-37	5.09-37	9.07-37	1.41-36	2.03-36	2.83-36	3.80-36	5.03-36	6.58-36	8.55-36	1.11-35	1.43-35	1.85-35	2.41-35
40	2.39-37	7.00-37	1.40-36	2.25-36	3.37-36	4.85-36	6.77-36	9.29-36	1.27-35	1.72-35	2.34-35	3.21-35	4.44-35	6.24-35
35	2.29-37	1.11-36	2.33-36	4.03-36	6.39-36	9.79-36	1.45-35	2.14-35	3.15-35	4.69-35	7.10-35	1.11-34	1.79-34	3.05-34
30	-2.06-37	1.96-36	4.37-36	8.63-36	1.55-35	2.69-35	4.58-35	7.93-35	1.43-34	2.75-34	5.86-34	1.50-33	5.27-33	4.15-32
29	-4.81-37	1.59-36	4.94-36	1.04-35	1.94-35	3.52-35	6.29-35	1.16-34	2.27-34	4.92-34	1.27-33	4.53-33	3.54-32	
28	-9.05-37	1.54-36	5.66-36	1.27-35	2.49-35	4.78-35	9.13-35	1.83-34	4.05-34	1.06-33	3.81-33	3.06-32		
27	-1.58-36	1.30-36	6.46-36	1.58-35	3.31-35	6.81-35	1.42-34	3.22-34	8.60-34	3.14-33	2.52-32			
26	-2.66-36	7.46-37	7.29-36	2.00-35	4.59-35	1.04-34	2.46-34	6.78-34	2.54-33	2.08-32				
25	-4.46-36	-5.05-37	7.90-36	2.60-35	6.72-35	1.75-34	5.05-34	1.96-33	1.64-32					
24	-7.56-36	-3.18-36	7.65-36	3.45-35	1.07-34	3.46-34	1.42-33	1.23-32						
23	-1.32-35	-9.03-36	4.56-36	4.68-35	1.95-34	9.24-34	8.62-33							
22	-2.40-35	-2.27-35	-8.37-36	6.15-35	4.58-34	5.21-33								
21	-4.70-35	-5.84-35	-6.11-35	4.21-35	2.12-33									
20	-1.01-34	-1.67-34	-3.23-34	-7.32-34										
19	-2.65-34	-6.63-34	-3.36-33											
18	-9.57-34	-5.67-33												
17	-7.65-33													

HE + TE = 5.00+04 NE = 1.00+12 CASE B NC = 20

TOTAL RC = 4.921-13 4-3 RC = 6.156-14 4-3 EM = 2.609-25 2S RC = 1.352-13 2P RC = 3.570-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.74-03	8.42-04	3.62-04	1.87-04	1.09-04	6.93-05	4.66-05	3.29-05	2.40-05	1.81-05	1.40-05	1.10-05	8.81-06	7.17-06
45	3.77-03	1.16-03	4.97-04	2.57-04	1.50-04	9.51-05	6.40-05	4.51-05	3.30-05	2.48-05	1.91-05	1.51-05	1.21-05	9.84-06
40	5.37-03	1.65-03	7.09-04	3.67-04	2.14-04	1.36-04	9.12-05	6.43-05	4.70-05	3.54-05	2.73-05	2.15-05	1.72-05	1.40-05
35	8.04-03	2.47-03	1.06-03	5.49-04	3.20-04	2.03-04	1.36-04	9.60-05	7.02-05	5.28-05	4.07-05	3.21-05	2.57-05	2.09-05
30	1.28-02	3.93-03	1.69-03	8.74-04	5.09-04	3.23-04	2.17-04	1.53-04	1.12-04	8.40-05	6.47-05	5.09-05	4.08-05	3.31-05
29	1.42-02	4.35-03	1.87-03	9.68-04	5.64-04	3.57-04	2.40-04	1.69-04	1.24-04	9.30-05	7.17-05	5.64-05	4.51-05	3.67-05
28	1.58-02	4.84-03	2.08-03	1.08-03	6.28-04	3.97-04	2.67-04	1.88-04	1.37-04	1.03-04	7.96-05	6.26-05	5.01-05	4.07-05
27	1.76-02	5.40-03	2.32-03	1.20-03	7.00-04	4.43-04	2.98-04	2.10-04	1.53-04	1.15-04	8.88-05	6.98-05	5.59-05	4.54-05
26	1.98-02	6.06-03	2.60-03	1.35-03	7.85-04	4.97-04	3.34-04	2.35-04	1.72-04	1.29-04	9.94-05	7.82-05	6.26-05	5.08-05
25	2.23-02	6.82-03	2.93-03	1.52-03	8.84-04	5.59-04	3.76-04	2.65-04	1.93-04	1.45-04	1.12-04	8.79-05	7.03-05	5.71-05
24	2.52-02	7.72-03	3.32-03	1.72-03	1.00-03	6.33-04	4.25-04	2.99-04	2.18-04	1.64-04	1.26-04	9.93-05	7.94-05	6.44-05
23	2.87-02	8.79-03	3.77-03	1.95-03	1.14-03	7.20-04	4.84-04	3.40-04	2.48-04	1.87-04	1.44-04	1.13-04	9.01-05	7.30-05
22	3.28-02	1.01-02	4.32-03	2.23-03	1.30-03	8.23-04	5.53-04	3.89-04	2.84-04	2.13-04	1.64-04	1.29-04	1.03-04	8.32-05
21	3.78-02	1.16-02	4.97-03	2.57-03	1.50-03	9.48-04	6.37-04	4.48-04	3.26-04	2.45-04	1.88-04	1.48-04	1.18-04	9.52-05
20	4.39-02	1.34-02	5.77-03	2.98-03	1.74-03	1.10-03	7.38-04	5.18-04	3.78-04	2.83-04	2.18-04	1.71-04	1.36-04	1.10-04
19	5.13-02	1.57-02	6.74-03	3.49-03	2.03-03	1.28-03	8.61-04	6.05-04	4.41-04	3.30-04	2.54-04	1.98-04	1.57-04	1.26-04
18	6.05-02	1.85-02	7.95-03	4.11-03	2.39-03	1.51-03	1.01-03	7.12-04	5.18-04	3.88-04	2.97-04	2.32-04	1.83-04	1.46-04
17	7.20-02	2.21-02	9.46-03	4.89-03	2.84-03	1.80-03	1.20-03	8.45-04	6.14-04	4.59-04	3.51-04	2.73-04	2.14-04	1.68-04
16	8.52-02	2.62-02	1.14-02	5.88-03	3.42-03	2.16-03	1.44-03	1.01-03	7.35-04	5.48-04	4.17-04	3.22-04	2.48-04	1.83-04
15	1.05-01	3.23-02	1.38-02	7.14-03	4.15-03	2.62-03	1.75-03	1.23-03	8.87-04	6.59-04	4.98-04	3.78-04	2.74-04	
14	1.30-01	3.98-02	1.70-02	8.80-03	5.11-03	3.22-03	2.15-03	1.50-03	1.08-03	7.97-04	5.92-04	4.22-04		
13	1.63-01	4.98-02	2.13-02	1.10-02	6.37-03	4.00-03	2.67-03	1.85-03	1.33-03	9.62-04	6.72-04			
12	2.07-01	6.31-02	2.70-02	1.39-02	8.05-03	5.05-03	3.35-03	2.31-03	1.63-03	1.11-03				
11	2.66-01	8.13-02	3.48-02	1.79-02	1.03-02	6.45-03	4.25-03	2.88-03	1.91-03					
10	3.48-01	1.06-01	4.53-02	2.32-02	1.34-02	8.29-03	5.37-03	3.42-03						
9	4.59-01	1.40-01	5.95-02	3.04-02	1.74-02	1.06-02	6.45-03							
8	6.08-01	1.85-01	7.83-02	3.97-02	2.23-02	1.28-02								
7	8.14-01	2.46-01	1.04-01	5.17-02	2.73-02									
6	1.16+00	3.49-01	1.44-01	6.77-02										
5	1.88+00	5.54-01	2.16-01											
4	3.68+00	1.00+00												
3	9.73+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.92-06	4.94-06	4.16-06	3.54-06	3.03-06	2.62-06	2.28-06	2.00-06	1.76-06	1.55-06	1.38-06	1.23-06	1.11-06	9.94-07
45	8.11-06	6.77-06	5.70-06	4.85-06	4.16-06	3.59-06	3.12-06	2.73-06	2.41-06	2.13-06	1.89-06	1.69-06	1.51-06	1.36-06
40	1.15-05	9.63-06	8.11-06	6.90-06	5.91-06	5.11-06	4.44-06	3.88-06	3.41-06	3.02-06	2.68-06	2.39-06	2.14-06	1.92-06
35	1.72-05	1.44-05	1.21-05	1.03-05	8.80-06	7.59-06	6.60-06	5.76-06	5.06-06	4.47-06	3.96-06	3.52-06	3.14-06	2.81-06
30	2.73-05	2.27-05	1.91-05	1.62-05	1.39-05	1.20-05	1.04-05	9.02-06	7.89-06	6.92-06	6.07-06	5.31-06	4.68-06	3.74-06
29	3.02-05	2.51-05	2.11-05	1.79-05	1.53-05	1.32-05	1.14-05	9.93-06	8.66-06	7.56-06	6.59-06	5.66-06	4.60-06	
28	3.35-05	2.79-05	2.35-05	1.99-05	1.70-05	1.46-05	1.26-05	1.09-05	9.51-06	8.24-06	7.05-06	5.71-06		
27	3.73-05	3.11-05	2.61-05	2.21-05	1.89-05	1.62-05	1.40-05	1.21-05	1.04-05	8.86-06	7.13-06			
26	4.18-05	3.47-05	2.92-05	2.47-05	2.10-05	1.80-05	1.54-05	1.32-05	1.12-05	9.00-06				
25	4.69-05	3.90-05	3.27-05	2.76-05	2.35-05	2.00-05	1.70-05	1.44-05	1.15-05					
24	5.29-05	4.39-05	3.67-05	3.10-05	2.62-05	2.22-05	1.86-05	1.47-05						
23	5.99-05	4.96-05	4.14-05	3.48-05	2.92-05	2.43-05	1.92-05							
22	6.81-05	5.63-05	4.68-05	3.90-05	3.22-05	2.52-05								
21	7.78-05	6.41-05	5.29-05	4.33-05	3.36-05									
20	8.91-05	7.28-05	5.91-05	4.55-05										
19	1.02-04	8.20-05	6.26-05											
18	1.16-04	8.77-05												
17	1.25-04													

HE + TE = 5.00+04 NE = 1.00+12 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.40-34	5.23-40	-3.45-39	-1.20-38	-2.66-38	-4.04-38	-3.76-38	-1.11-38	3.76-38	1.06-37	1.95-37	3.06-37	4.42-37	6.08-37
45	3.30-34	7.13-40	-4.78-39	-1.67-38	-3.72-38	-5.68-38	-5.36-38	-1.72-38	5.10-38	1.49-37	2.77-37	4.38-37	6.40-37	8.89-37
40	4.70-34	1.01-39	-6.91-39	-2.42-38	-5.43-38	-8.38-38	-8.07-38	-2.66-38	7.12-38	2.17-37	4.12-37	6.63-37	9.82-37	1.39-36
35	7.04-34	1.49-39	-1.05-38	-3.71-38	-8.42-38	-1.32-37	-1.30-37	-5.26-38	1.02-37	3.35-37	6.56-37	1.08-36	1.64-36	2.38-36
30	1.12-33	2.33-39	-1.73-38	-6.14-38	-1.42-37	-2.27-37	-2.34-37	-1.11-37	1.50-37	5.61-37	1.15-36	1.98-36	3.14-36	4.74-36
29	1.25-33	2.57-39	-1.93-38	-6.88-38	-1.59-37	-2.56-37	-2.67-37	-1.32-37	1.61-37	6.29-37	1.31-36	2.28-36	3.65-36	5.60-36
28	1.39-33	2.84-39	-2.16-38	-7.74-38	-1.80-37	-2.91-37	-3.07-37	-1.59-37	1.72-37	7.09-37	1.50-36	2.65-36	4.30-36	6.68-36
27	1.55-33	3.15-39	-2.44-38	-8.75-38	-2.04-37	-3.34-37	-3.56-37	-1.92-37	1.83-37	8.03-37	1.74-36	3.11-36	5.12-36	8.10-36
26	1.74-33	3.50-39	-2.76-38	-9.94-38	-2.33-37	-3.85-37	-4.17-37	-2.36-37	1.93-37	9.15-37	2.02-36	3.68-36	6.18-36	9.97-36
25	1.96-33	3.92-39	-3.15-38	-1.14-37	-2.69-37	-4.47-37	-4.92-37	-2.92-37	2.00-37	1.05-36	2.38-36	4.42-36	7.58-36	1.25-35
24	2.22-33	4.39-39	-3.61-38	-1.31-37	-3.12-37	-5.24-37	-5.88-37	-3.67-37	2.01-37	1.21-36	2.83-36	5.39-36	9.49-36	1.62-35
23	2.52-33	4.95-39	-4.17-38	-1.52-37	-3.65-37	-6.21-37	-7.11-37	-4.69-37	1.90-37	1.40-36	3.41-36	6.69-36	1.21-35	2.15-35
22	2.89-33	5.60-39	-4.86-38	-1.78-37	-4.32-37	-7.44-37	-8.72-37	-6.10-37	1.61-37	1.63-36	4.16-36	8.49-36	1.60-35	2.97-35
21	3.33-33	6.37-39	-5.71-38	-2.11-37	-5.16-37	-9.04-37	-1.09-36	-8.10-37	9.57-38	1.90-36	5.18-36	1.11-35	2.20-35	4.33-35
20	3.87-33	7.28-39	-6.76-38	-2.52-37	-6.25-37	-1.11-36	-1.39-36	-1.10-36	-3.12-38	2.24-36	6.59-36	1.49-35	3.17-35	6.79-35
19	4.54-33	8.37-39	-8.11-38	-3.05-37	-7.67-37	-1.40-36	-1.79-36	-1.54-36	-2.79-37	2.62-36	8.60-36	2.11-35	4.89-35	1.18-34
18	5.36-33	9.68-39	-9.84-38	-3.74-37	-9.59-37	-1.79-36	-2.39-36	-2.22-36	-7.61-37	3.01-36	1.16-35	3.16-35	8.35-35	2.45-34
17	6.40-33	1.13-38	-1.21-37	-4.67-37	-1.22-36	-2.36-36	-3.29-36	-3.33-36	-1.72-36	3.25-36	1.63-35	5.20-35	1.68-34	6.96-34
16	7.73-33	1.33-38	-1.52-37	-5.94-37	-1.60-36	-3.19-36	-4.71-36	-5.27-36	-3.73-36	2.84-36	2.40-35	9.88-35	4.58-34	4.29-33
15	9.46-33	1.58-38	-1.93-37	-7.73-37	-2.14-36	-4.49-36	-7.09-36	-8.87-36	-8.28-36	-1.93-37	3.77-35	2.46-34	2.66-33	
14	1.18-32	1.91-38	-2.51-37	-1.03-36	-2.98-36	-6.60-36	-1.13-35	-1.63-35	-1.99-35	1.45-35	6.05-35	1.22-33		
13	1.49-32	2.37-38	-3.34-37	-1.42-36	-4.33-36	-1.03-35	-1.98-35	-3.37-35	-5.63-35	-9.61-35	-3.43-35			
12	1.92-32	3.08-38	-4.57-37	-2.04-36	-6.63-36	-1.74-35	-3.87-35	-8.38-35	-2.17-34	-1.07-33				
11	2.55-32	4.32-38	-6.39-37	-3.00-36	-1.09-35	-3.29-35	-9.09-35	-2.90-34	-1.82-33					
10	3.48-32	6.86-38	-9.12-37	-4.78-36	-1.95-35	-7.32-35	-2.94-34	-2.19-33						
9	4.96-32	1.29-37	-1.30-36	-7.91-36	-4.01-35	-2.18-34	-2.03-33							
8	7.44-32	2.88-37	-1.78-36	-1.39-35	-1.03-34	-1.31-33								
7	1.20-31	7.16-37	-2.06-36	-2.68-35	-4.75-34									
6	2.16-31	1.89-36	-1.35-36	-8.27-35										
5	4.62-31	6.00-36	8.42-36											
4	1.38-30	3.54-35												
3	1.00-29													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	8.09-37	1.05-36	1.34-36	1.70-36	2.13-36	2.64-36	3.27-36	4.03-36	4.94-36	6.07-36	7.44-36	9.13-36	1.12-35	1.38-35
45	1.20-36	1.57-36	2.00-36	2.62-36	3.33-36	4.21-36	5.31-36	6.68-36	8.39-36	1.06-35	1.33-35	1.69-35	2.15-35	2.75-35
40	1.90-36	2.55-36	3.37-36	4.42-36	5.76-36	7.50-36	9.74-36	1.27-35	1.66-35	2.18-35	2.89-35	3.87-35	5.25-35	7.25-35
35	3.35-36	4.63-36	6.33-36	8.62-36	1.17-35	1.60-35	2.20-35	3.05-35	4.29-35	6.16-35	9.06-35	1.38-34	2.18-34	3.64-34
30	7.01-36	1.02-35	1.49-35	2.18-35	3.24-35	4.90-35	7.63-35	1.23-34	2.10-34	3.88-34	8.01-34	1.98-33	6.84-33	5.21-32
29	8.39-36	1.25-35	1.85-35	2.78-35	4.24-35	6.65-35	1.08-34	1.86-34	3.43-34	7.12-34	1.77-33	6.14-33	4.73-32	
28	1.02-35	1.54-35	2.35-35	3.62-35	5.73-35	9.40-35	1.62-34	3.02-34	6.28-34	1.57-33	5.45-33	4.20-32		
27	1.26-35	1.95-35	3.05-35	4.85-35	8.08-35	1.41-34	2.63-34	5.51-34	1.38-33	4.81-33	3.73-32			
26	1.58-35	2.53-35	4.11-35	6.88-35	1.21-34	2.28-34	4.80-34	1.21-33	4.22-33	3.28-32				
25	2.00-35	3.40-35	5.77-35	1.02-34	1.95-34	4.14-34	1.05-33	3.69-33	2.87-32					
24	2.75-35	4.75-35	8.56-35	1.65-34	3.53-34	9.03-34	3.20-33	2.51-32						
23	3.82-35	7.02-35	1.37-34	2.97-34	7.65-34	2.74-33	2.16-32							
22	5.61-35	1.12-34	2.46-34	6.41-34	2.31-33	1.84-32								
21	8.88-35	1.99-34	5.28-34	1.92-33	1.55-32									
20	1.57-34	4.25-34	1.57-33	1.28-32										
19	3.31-34	1.25-33	1.03-32											
18	9.60-34	8.12-33												
17	6.11-33													

HE + TE = 5.00+04 NE = 1.00+13 CASE B NC = 20

TOTAL RC = 5.504-13 4-3 RC = 7.279-14 4-3 EM = 3.085-25 2S RC = 1.289-13 2P RC = 4.215-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.32-03	7.12-04	3.06-04	1.59-04	9.25-05	5.86-05	3.94-05	2.78-05	2.03-05	1.53-05	1.18-05	9.30-06	7.45-06	6.07-06
45	3.19-03	9.78-04	4.20-04	2.18-04	1.27-04	8.04-05	5.41-05	3.81-05	2.79-05	2.10-05	1.62-05	1.28-05	1.02-05	8.32-06
40	4.54-03	1.39-03	5.99-04	3.10-04	1.81-04	1.15-04	7.71-05	5.43-05	3.97-05	2.99-05	2.31-05	1.82-05	1.46-05	1.18-05
35	6.80-03	2.09-03	8.96-04	4.64-04	2.71-04	1.71-04	1.15-04	8.12-05	5.93-05	4.47-05	3.45-05	2.71-05	2.17-05	1.77-05
30	1.08-02	3.32-03	1.43-03	7.39-04	4.31-04	2.73-04	1.83-04	1.29-04	9.44-05	7.10-05	5.47-05	4.31-05	3.45-05	2.80-05
29	1.20-02	3.68-03	1.58-03	8.19-04	4.77-04	3.02-04	2.03-04	1.43-04	1.05-04	7.86-05	6.06-05	4.77-05	3.82-05	3.10-05
28	1.34-02	4.09-03	1.76-03	9.11-04	5.31-04	3.36-04	2.26-04	1.59-04	1.16-04	8.74-05	6.73-05	5.30-05	4.24-05	3.45-05
27	1.49-02	4.57-03	1.96-03	1.02-03	5.92-04	3.75-04	2.52-04	1.77-04	1.30-04	9.75-05	7.51-05	5.91-05	4.73-05	3.84-05
26	1.67-02	5.13-03	2.20-03	1.14-03	6.64-04	4.20-04	2.83-04	1.99-04	1.45-04	1.09-04	8.41-05	6.62-05	5.29-05	4.30-05
25	1.88-02	5.77-03	2.48-03	1.28-03	7.48-04	4.73-04	3.18-04	2.24-04	1.63-04	1.23-04	9.46-05	7.44-05	5.95-05	4.83-05
24	2.13-02	6.54-03	2.81-03	1.45-03	8.46-04	5.35-04	3.60-04	2.53-04	1.85-04	1.39-04	1.07-04	8.41-05	6.72-05	5.45-05
23	2.43-02	7.44-03	3.19-03	1.65-03	9.63-04	6.09-04	4.09-04	2.88-04	2.10-04	1.58-04	1.22-04	9.54-05	7.62-05	6.18-05
22	2.78-02	8.52-03	3.66-03	1.89-03	1.10-03	6.97-04	4.68-04	3.29-04	2.40-04	1.80-04	1.39-04	1.09-04	8.70-05	7.04-05
21	3.20-02	9.81-03	4.21-03	2.18-03	1.27-03	8.03-04	5.39-04	3.79-04	2.76-04	2.07-04	1.60-04	1.25-04	9.98-05	8.06-05
20	3.72-02	1.14-02	4.89-03	2.53-03	1.47-03	9.31-04	6.25-04	4.39-04	3.20-04	2.40-04	1.84-04	1.45-04	1.15-04	9.28-05
19	4.35-02	1.33-02	5.72-03	2.96-03	1.72-03	1.09-03	7.30-04	5.13-04	3.73-04	2.80-04	2.15-04	1.68-04	1.33-04	1.07-04
18	5.13-02	1.57-02	6.74-03	3.49-03	2.03-03	1.28-03	8.60-04	6.04-04	4.39-04	3.29-04	2.52-04	1.97-04	1.56-04	1.24-04
17	6.12-02	1.87-02	8.03-03	4.15-03	2.42-03	1.53-03	1.02-03	7.17-04	5.21-04	3.90-04	2.98-04	2.32-04	1.82-04	1.42-04
16	7.37-02	2.26-02	9.68-03	5.00-03	2.91-03	1.83-03	1.23-03	8.61-04	6.25-04	4.66-04	3.55-04	2.74-04	2.11-04	1.56-04
15	9.00-02	2.75-02	1.18-02	6.09-03	3.54-03	2.23-03	1.49-03	1.05-03	7.57-04	5.62-04	4.25-04	3.22-04	2.34-04	
14	1.11-01	3.41-02	1.46-02	7.54-03	4.38-03	2.76-03	1.84-03	1.28-03	9.26-04	6.83-04	5.07-04	3.62-04		
13	1.40-01	4.29-02	1.84-02	9.47-03	5.49-03	3.45-03	2.30-03	1.60-03	1.14-03	8.29-04	5.79-04			
12	1.80-01	5.50-02	2.35-02	1.21-02	7.02-03	4.40-03	2.92-03	2.01-03	1.42-03	9.66-04				
11	2.36-01	7.21-02	3.08-02	1.58-02	9.15-03	5.72-03	3.76-03	2.55-03	1.69-03					
10	3.18-01	9.70-02	4.14-02	2.12-02	1.22-02	7.57-03	4.90-03	3.12-03						
9	4.41-01	1.34-01	5.71-02	2.92-02	1.66-02	1.01-02	6.17-03							
8	6.30-01	1.91-01	8.10-02	4.11-02	2.30-02	1.32-02								
7	9.21-01	2.79-01	1.17-01	5.83-02	3.08-02									
6	1.36+00	4.07-01	1.68-01	7.87-02										
5	2.03+00	5.98-01	2.32-01											
4	3.62+00	1.00+00												
3	9.35+00													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	5.00-06	4.17-06	3.52-06	2.99-06	2.57-06	2.22-06	1.93-06	1.69-06	1.49-06	1.31-06	1.17-06	1.04-06	9.34-07	8.41-07
45	6.86-06	5.72-06	4.82-06	4.10-06	3.52-06	3.04-06	2.64-06	2.31-06	2.03-06	1.80-06	1.60-06	1.43-06	1.28-06	1.15-06
40	9.76-06	8.14-06	6.86-06	5.83-06	5.00-06	4.32-06	3.75-06	3.28-06	2.89-06	2.55-06	2.26-06	2.02-06	1.81-06	1.62-06
35	1.46-05	1.21-05	1.02-05	8.69-06	7.44-06	6.42-06	5.58-06	4.87-06	4.28-06	3.78-06	3.35-06	2.98-06	2.65-06	2.37-06
30	2.31-05	1.92-05	1.62-05	1.37-05	1.17-05	1.01-05	8.76-06	7.63-06	6.67-06	5.85-06	5.13-06	4.49-06	3.88-06	3.16-06
29	2.55-05	2.13-05	1.79-05	1.52-05	1.30-05	1.12-05	9.66-06	8.40-06	7.33-06	6.40-06	5.57-06	4.79-06	3.89-06	
28	2.84-05	2.36-05	1.98-05	1.68-05	1.44-05	1.23-05	1.07-05	9.26-06	8.04-06	6.97-06	5.97-06	4.83-06		
27	3.16-05	2.63-05	2.21-05	1.87-05	1.60-05	1.37-05	1.18-05	1.02-05	8.80-06	7.49-06	6.03-06			
26	3.53-05	2.94-05	2.47-05	2.09-05	1.78-05	1.52-05	1.31-05	1.12-05	9.50-06	7.61-06				
25	3.97-05	3.30-05	2.76-05	2.34-05	1.98-05	1.69-05	1.44-05	1.22-05	9.69-06					
24	4.47-05	3.71-05	3.11-05	2.62-05	2.22-05	1.88-05	1.57-05	1.25-05						
23	5.07-05	4.20-05	3.51-05	2.94-05	2.47-05	2.06-05	1.62-05							
22	5.77-05	4.77-05	3.97-05	3.30-05	2.73-05	2.14-05								
21	6.59-05	5.42-05	4.48-05	3.67-05	2.85-05									
20	7.55-05	6.17-05	5.01-05	3.86-05										
19	8.66-05	6.95-05	5.31-05											
18	9.85-05	7.44-05												
17	1.06-04													

HE + TE = 5.00+04 NE = 1.00+13 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.75-35	1.99-40	-1.97-39	-3.84-39	3.76-39	2.60-38	6.04-38	1.06-37	1.65-37	2.38-37	3.28-37	4.40-37	5.77-37	7.43-37
45	3.77-35	2.69-40	-2.74-39	-5.39-39	5.05-39	3.59-38	8.41-38	1.49-37	2.32-37	3.37-37	4.70-37	6.35-37	8.39-37	1.09-36
40	5.38-35	3.74-40	-3.98-39	-7.91-39	6.98-39	5.16-38	1.22-37	2.18-37	3.44-37	5.04-37	7.10-37	9.70-37	1.30-36	1.72-36
35	8.05-35	5.40-40	-6.11-39	-1.23-38	9.90-39	7.82-38	1.88-37	3.40-37	5.43-37	8.09-37	1.16-36	1.61-36	2.20-36	2.98-36
30	1.28-34	8.09-40	-1.01-38	-2.10-38	1.44-38	1.27-37	3.13-37	5.79-37	9.44-37	1.44-36	2.12-36	3.04-36	4.31-36	6.06-36
29	1.42-34	8.82-40	-1.13-38	-2.36-38	1.55-38	1.42-37	3.51-37	6.53-37	1.07-36	1.65-36	2.44-36	3.53-36	5.05-36	7.19-36
28	1.58-34	9.62-40	-1.28-38	-2.67-38	1.67-38	1.58-37	3.96-37	7.40-37	1.22-36	1.89-36	2.83-36	4.14-36	5.99-36	8.65-36
27	1.77-34	1.05-39	-1.44-38	-3.05-38	1.79-38	1.78-37	4.49-37	8.45-37	1.41-36	2.20-36	3.31-36	4.90-36	7.20-36	1.06-35
26	1.98-34	1.15-39	-1.64-38	-3.50-38	1.92-38	2.01-37	5.11-37	9.71-37	1.63-36	2.57-36	3.92-36	5.88-36	8.77-36	1.31-35
25	2.24-34	1.26-39	-1.88-38	-4.04-38	2.04-38	2.28-37	5.87-37	1.12-36	1.91-36	3.04-36	4.70-36	7.17-36	1.09-35	1.66-35
24	2.53-34	1.38-39	-2.16-38	-4.70-38	2.15-38	2.60-37	6.79-37	1.31-36	2.25-36	3.65-36	5.72-36	8.89-36	1.38-35	2.17-35
23	2.89-34	1.51-39	-2.51-38	-5.52-38	2.23-38	2.99-37	7.91-37	1.55-36	2.70-36	4.43-36	7.09-36	1.13-35	1.80-35	2.93-35
22	3.31-34	1.64-39	-2.94-38	-6.56-38	2.26-38	3.46-37	9.31-37	1.85-36	3.27-36	5.48-36	8.96-36	1.46-35	2.42-35	4.11-35
21	3.81-34	1.79-39	-3.48-38	-7.87-38	2.20-38	4.03-37	1.11-36	2.24-36	4.04-36	6.91-36	1.16-35	1.96-35	3.39-35	6.12-35
20	4.43-34	1.93-39	-4.16-38	-9.57-38	1.98-38	4.74-37	1.34-36	2.76-36	5.09-36	8.94-36	1.56-35	2.75-35	5.03-35	9.83-35
19	5.19-34	2.06-39	-5.03-38	-1.18-37	1.47-38	5.63-37	1.63-36	3.46-36	6.56-36	1.19-35	2.17-35	4.06-35	8.06-35	1.77-34
18	6.13-34	2.15-39	-6.17-38	-1.48-37	4.68-39	6.76-37	2.03-36	4.44-36	8.71-36	1.66-35	3.20-35	6.48-35	1.44-34	3.80-34
17	7.32-34	2.17-39	-7.70-38	-1.90-37	-1.40-38	8.20-37	2.58-36	5.86-36	1.20-35	2.43-35	5.07-35	1.15-34	3.09-34	1.14-33
16	8.85-34	2.04-39	-9.79-38	-2.49-37	-4.85-38	1.01-36	3.36-36	8.02-36	1.75-35	3.83-35	8.97-35	2.45-34	9.17-34	7.51-33
15	1.08-33	1.65-39	-1.27-37	-3.35-37	-1.12-37	1.25-36	4.52-36	1.15-35	2.73-35	6.71-35	1.89-34	7.22-34	6.01-33	
14	1.34-33	7.41-40	-1.70-37	-4.67-37	-2.33-37	1.58-36	6.32-36	1.77-35	4.72-35	1.40-34	5.51-34	4.68-33		
13	1.70-33	-1.10-39	-2.35-37	-6.80-37	-4.70-37	2.00-36	9.36-36	2.99-35	9.66-35	4.00-34	3.51-33			
12	2.20-33	-4.69-39	-3.37-37	-1.04-36	-9.69-37	2.50-36	1.50-35	5.91-35	2.69-34	2.49-33				
11	2.91-33	-1.16-38	-5.08-37	-1.70-36	-2.11-36	2.83-36	2.70-35	1.56-34	1.61-33					
10	3.98-33	-2.47-38	-8.13-37	-3.04-36	-5.06-36	1.39-36	6.03-35	8.50-34						
9	5.67-33	-4.93-38	-1.40-36	-6.11-36	-1.43-35	-1.41-35	2.20-34							
8	8.51-33	-9.09-38	-2.66-36	-1.46-35	-5.54-35	-2.47-34								
7	1.37-32	-1.28-37	-5.63-36	-4.65-35	-4.49-34									
6	2.47-32	9.25-38	-1.33-35	-2.79-34										
5	5.28-32	2.30-36	-3.74-35											
4	1.58-31	2.44-35												
3	1.15-30													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	9.46-37	1.19-36	1.49-36	1.85-36	2.28-36	2.80-36	3.43-36	4.20-36	5.13-36	6.27-36	7.65-36	9.36-36	1.15-35	1.41-35
45	1.41-36	1.79-36	2.27-36	2.85-36	3.58-36	4.47-36	5.59-36	6.98-36	8.73-36	1.09-35	1.37-35	1.73-35	2.20-35	2.81-35
40	2.24-36	2.91-36	3.76-36	4.84-36	6.22-36	8.00-36	1.03-35	1.33-35	1.73-35	2.26-35	2.99-35	3.99-35	5.40-35	7.44-35
35	4.00-36	5.34-36	7.12-36	9.51-36	1.27-35	1.72-35	2.34-35	3.22-35	4.51-35	6.43-35	9.31-35	1.42-34	2.25-34	3.76-34
30	8.52-36	1.20-35	1.70-35	2.44-35	3.57-35	5.33-35	8.21-35	1.32-34	2.23-34	4.09-34	8.39-34	2.07-33	7.12-33	5.44-32
29	1.02-35	1.47-35	2.12-35	3.12-35	4.68-35	7.24-35	1.17-34	1.99-34	3.69-34	7.52-34	1.86-33	6.42-33	4.91-32	
28	1.25-35	1.83-35	2.70-35	4.08-35	6.35-35	1.03-34	1.76-34	3.24-34	6.70-34	1.66-33	5.74-33	4.42-32		
27	1.56-35	2.32-35	3.54-35	5.54-35	9.01-35	1.55-34	2.87-34	5.95-34	1.48-33	5.12-33	3.94-32			
26	1.98-35	3.04-35	4.79-35	7.84-35	1.35-34	2.52-34	5.25-34	1.31-33	4.55-33	3.52-32				
25	2.58-35	4.11-35	6.77-35	1.18-34	2.20-34	4.60-34	1.15-33	4.03-33	3.11-32					
24	3.49-35	5.80-35	1.01-34	1.91-34	4.01-34	1.01-33	3.54-33	2.76-32						
23	4.91-35	8.66-35	1.64-34	3.47-34	8.77-34	3.08-33	2.41-32							
22	7.32-35	1.40-34	2.98-34	7.57-34	2.68-33	2.09-32								
21	1.18-34	2.53-34	6.48-34	2.30-33	1.81-32									
20	2.13-34	5.50-34	1.97-33	1.56-32										
19	4.60-34	1.66-33	1.32-32											
18	1.38-33	1.11-32												
17	9.20-33													

HE + TE = 1.00+05 NE = 1.00+02 CASE B NC = 70

TOTAL RC = 2.340-13 4-3 RC = 2.710-14 4-3 EM = 1.148-25 2S RC = 8.524-14 2P RC = 1.488-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.58-03	4.91-04	2.22-04	1.20-04	7.23-05	4.70-05	3.23-05	2.31-05	1.71-05	1.30-05	1.02-05	8.06-06	6.51-06	5.32-06
45	2.15-03	6.73-04	3.04-04	1.65-04	9.93-05	6.46-05	4.43-05	3.18-05	2.35-05	1.79-05	1.40-05	1.11-05	8.93-06	7.31-06
40	3.05-03	9.57-04	4.33-04	2.34-04	1.41-04	9.20-05	6.32-05	4.53-05	3.35-05	2.55-05	1.99-05	1.58-05	1.27-05	1.04-05
35	4.5 -3	1.43-03	6.47-04	3.50-04	2.11-04	1.37-04	9.43-05	6.76-05	5.01-05	3.81-05	2.97-05	2.35-05	1.90-05	1.55-05
30	7.23-03	2.27-03	1.03-03	5.56-04	3.35-04	2.18-04	1.50-04	1.07-04	7.95-05	6.05-05	4.71-05	3.73-05	3.01-05	2.46-05
29	8.01-03	2.51-03	1.14-03	6.15-04	3.71-04	2.41-04	1.66-04	1.19-04	8.80-05	6.69-05	5.21-05	4.13-05	3.33-05	2.72-05
28	8.90-03	2.79-03	1.26-03	6.83-04	4.12-04	2.68-04	1.84-04	1.32-04	9.77-05	7.44-05	5.79-05	4.59-05	3.70-05	3.02-05
27	9.93-03	3.11-03	1.41-03	7.62-04	4.60-04	2.99-04	2.05-04	1.47-04	1.09-04	8.29-05	6.45-05	5.12-05	4.12-05	3.37-05
26	1.11-02	3.48-03	1.58-03	8.53-04	5.15-04	3.35-04	2.30-04	1.65-04	1.22-04	9.28-05	7.22-05	5.73-05	4.61-05	3.77-05
25	1.25-02	3.92-03	1.77-03	9.60-04	5.79-04	3.77-04	2.59-04	1.85-04	1.37-04	1.04-04	8.12-05	6.44-05	5.18-05	4.23-05
24	1.41-02	4.43-03	2.00-03	1.08-03	6.55-04	4.26-04	2.92-04	2.09-04	1.55-04	1.18-04	9.17-05	7.27-05	5.85-05	4.77-05
23	1.61-02	5.03-03	2.28-03	1.23-03	7.44-04	4.84-04	3.32-04	2.38-04	1.76-04	1.34-04	1.04-04	8.25-05	6.63-05	5.41-05
22	1.84-02	5.75-03	2.60-03	1.41-03	8.50-04	5.53-04	3.80-04	2.72-04	2.01-04	1.53-04	1.19-04	9.41-05	7.56-05	6.16-05
21	2.11-02	6.61-03	2.99-03	1.62-03	9.78-04	6.36-04	4.36-04	3.12-04	2.31-04	1.76-04	1.37-04	1.08-04	8.67-05	7.05-05
20	2.45-02	7.66-03	3.46-03	1.87-03	1.13-03	7.36-04	5.05-04	3.62-04	2.68-04	2.03-04	1.58-04	1.25-04	9.99-05	8.10-05
19	2.86-02	8.93-03	4.04-03	2.19-03	1.32-03	8.58-04	5.89-04	4.22-04	3.12-04	2.37-04	1.84-04	1.45-04	1.16-04	9.34-05
18	3.37-02	1.05-02	4.75-03	2.57-03	1.55-03	1.01-03	6.93-04	4.96-04	3.66-04	2.78-04	2.15-04	1.69-04	1.35-04	1.08-04
17	4.00-02	1.25-02	5.64-03	3.05-03	1.84-03	1.20-03	8.22-04	5.88-04	4.34-04	3.29-04	2.54-04	1.99-04	1.57-04	1.23-04
16	4.81-02	1.50-02	6.77-03	3.66-03	2.21-03	1.44-03	9.86-04	7.04-04	5.19-04	3.93-04	3.02-04	2.35-04	1.82-04	1.33-04
15	5.84-02	1.82-02	8.22-03	4.45-03	2.68-03	1.74-03	1.20-03	8.53-04	6.28-04	4.73-04	3.61-04	2.75-04	1.98-04	
14	7.20-02	2.24-02	1.01-02	5.47-03	3.30-03	2.14-03	1.47-03	1.05-03	7.67-04	5.73-04	4.29-04	3.05-04		
13	9.01-02	2.80-02	1.27-02	6.84-03	4.12-03	2.68-03	1.83-03	1.30-03	9.46-04	6.94-04	4.85-04			
12	1.15-01	3.57-02	1.61-02	8.71-03	5.24-03	3.40-03	2.32-03	1.63-03	1.17-03	8.00-04				
11	1.50-01	4.64-02	2.09-02	1.13-02	6.81-03	4.40-03	2.98-03	2.07-03	1.38-03					
10	2.01-01	6.19-02	2.79-02	1.51-02	9.05-03	5.81-03	3.87-03	2.52-03						
9	2.77-01	8.53-02	3.84-02	2.07-02	1.24-02	7.82-03	4.89-03							
8	3.99-01	1.22-01	5.49-02	2.94-02	1.73-02	1.03-02								
7	6.04-01	1.84-01	8.21-02	4.35-02	2.42-02									
6	9.82-01	2.96-01	1.30-01	6.52-02										
5	1.77+00	5.18-01	2.16-01											
4	3.70+00	1.00+00												
3	1.01+01													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.41-06	3.69-06	3.12-06	2.67-06	2.29-06	1.98-06	1.73-06	1.52-06	1.34-06	1.18-06	1.05-06	9.39-07	8.42-07	7.57-07
45	6.05-06	5.07-06	4.29-06	3.66-06	3.14-06	2.72-06	2.37-06	2.08-06	1.83-06	1.62-06	1.44-06	1.28-06	1.15-06	1.03-06
40	8.62-06	7.22-06	6.10-06	5.20-06	4.47-06	3.87-06	3.37-06	2.95-06	2.59-06	2.29-06	2.04-06	1.82-06	1.62-06	1.46-06
35	1.29-05	1.08-05	9.09-06	7.74-06	6.65-06	5.75-06	5.00-06	4.37-06	3.84-06	3.39-06	3.00-06	2.66-06	2.37-06	2.11-06
30	2.04-05	1.70-05	1.44-05	1.22-05	1.05-05	9.03-06	7.83-06	6.81-06	5.95-06	5.20-06	4.55-06	3.95-06	3.38-06	2.71-06
29	2.25-05	1.88-05	1.59-05	1.35-05	1.16-05	9.96-06	8.62-06	7.49-06	6.52-06	5.67-06	4.91-06	4.18-06	3.34-06	
28	2.50-05	2.09-05	1.76-05	1.50-05	1.28-05	1.10-05	9.51-06	8.23-06	7.13-06	6.15-06	5.21-06	4.15-06		
27	2.78-05	2.32-05	1.96-05	1.66-05	1.42-05	1.22-05	1.05-05	9.05-06	7.76-06	6.55-06	5.19-06			
26	3.11-05	2.60-05	2.19-05	1.85-05	1.58-05	1.35-05	1.16-05	9.89-06	8.31-06	6.55-06				
25	3.49-05	2.91-05	2.45-05	2.07-05	1.76-05	1.50-05	1.27-05	1.06-05	8.34-06					
24	3.94-05	3.28-05	2.75-05	2.32-05	1.96-05	1.66-05	1.38-05	1.07-05						
23	4.46-05	3.70-05	3.10-05	2.60-05	2.18-05	1.80-05	1.40-05							
22	5.07-05	4.20-05	3.50-05	2.91-05	2.39-05	1.84-05								
21	5.78-05	4.77-05	3.93-05	3.20-05	2.45-05									
20	6.61-05	5.41-05	4.37-05	3.32-05										
19	7.56-05	6.05-05	4.56-05											
18	8.55-05	6.38-05												
17	9.10-05													

HE + TE = 1.00+05 NE = 1.00+02 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.69-29	1.47-39	1.72-39	2.37-39	3.31-39	4.56-39	6.14-39	8.10-39	1.05-38	1.33-38	1.66-38	2.04-38	2.46-38	2.93-38
45	2.32-29	2.00-39	2.34-39	3.21-39	4.47-39	6.12-39	8.20-39	1.07-38	1.37-38	1.72-38	2.11-38	2.55-38	3.01-38	3.46-38
40	3.31-29	2.85-39	3.33-39	4.57-39	6.36-39	8.71-39	1.17-38	1.52-38	1.95-38	2.43-38	2.98-38	3.55-38	4.12-38	4.62-38
35	4.96-29	4.27-39	4.99-39	6.87-39	9.61-39	1.32-38	1.78-38	2.35-38	3.02-38	3.80-38	4.66-38	5.56-38	6.41-38	7.03-38
30	7.91-29	6.82-39	8.01-39	1.11-38	1.57-38	2.19-38	2.99-38	4.00-38	5.23-38	6.68-38	8.31-38	1.00-37	1.15-37	1.22-37
29	8.77-29	7.56-39	8.90-39	1.24-38	1.75-38	2.45-38	3.36-38	4.51-38	5.93-38	7.61-38	9.51-38	1.15-37	1.31-37	1.37-37
28	9.75-29	8.41-39	9.92-39	1.38-38	1.96-38	2.76-38	3.80-38	5.13-38	6.77-38	8.74-38	1.10-37	1.33-37	1.51-37	1.55-37
27	1.09-28	9.40-39	1.11-38	1.55-38	2.21-38	3.12-38	4.32-38	5.86-38	7.79-38	1.01-37	1.27-37	1.55-37	1.76-37	1.76-37
26	1.22-28	1.06-38	1.25-38	1.75-38	2.50-38	3.55-38	4.94-38	6.75-38	9.03-38	1.18-37	1.50-37	1.82-37	2.05-37	1.97-37
25	1.38-28	1.19-38	1.41-38	1.98-38	2.85-38	4.06-38	5.70-38	7.84-38	1.06-37	1.39-37	1.77-37	2.16-37	2.41-37	2.17-37
24	1.56-28	1.35-38	1.60-38	2.26-38	3.27-38	4.69-38	6.62-38	9.18-38	1.25-37	1.66-37	2.13-37	2.59-37	2.84-37	2.27-37
23	1.78-28	1.54-38	1.84-38	2.60-38	3.78-38	5.45-38	7.76-38	1.09-37	1.49-37	2.00-37	2.59-37	3.15-37	3.32-37	2.07-37
22	2.04-28	1.77-38	2.11-38	3.00-38	4.39-38	6.40-38	9.20-38	1.30-37	1.81-37	2.45-37	3.19-37	3.86-37	3.81-37	1.03-37
21	2.35-28	2.04-38	2.45-38	3.50-38	5.16-38	7.59-38	1.10-37	1.58-37	2.22-37	3.05-37	4.01-37	4.76-37	4.09-37	-2.38-37
20	2.73-28	2.38-38	2.86-38	4.12-38	6.13-38	9.10-38	1.34-37	1.95-37	2.78-37	3.88-37	5.12-37	5.86-37	3.41-37	-1.31-36
19	3.20-28	2.79-38	3.38-38	4.90-38	7.36-38	1.11-37	1.65-37	2.45-37	3.57-37	5.04-37	6.65-37	6.94-37	-8.62-38	-4.98-36
18	3.78-28	3.31-38	4.03-38	5.89-38	8.95-38	1.37-37	2.08-37	3.15-37	4.69-37	6.74-37	8.74-37	6.93-37	-1.96-36	-2.05-35
17	4.52-28	3.96-38	4.86-38	7.18-38	1.11-37	1.72-37	2.68-37	4.16-37	6.36-37	9.29-37	1.13-36	4.06-38	-1.10-35	-1.20-34
16	5.46-28	4.80-38	5.94-38	8.89-38	1.40-37	2.22-37	3.56-37	5.70-37	8.99-37	1.32-36	1.26-36	-4.47-36	-7.42-35	-1.77-33
15	6.68-28	5.91-38	7.38-38	1.12-37	1.80-37	2.95-37	4.89-37	8.16-37	1.34-36	1.89-36	-2.18-37	-4.12-35	-1.20-33	
14	8.31-28	7.38-38	9.34-38	1.45-37	2.39-37	4.06-37	7.05-37	1.24-36	2.10-36	2.26-36	-1.86-35	-7.62-34		
13	1.05-27	9.41-38	1.21-37	1.92-37	3.29-37	5.86-37	1.08-36	2.04-36	3.44-36	-4.26-36	-4.43-34			
12	1.36-27	1.23-37	1.61-37	2.65-37	4.74-37	9.03-37	1.82-36	3.75-36	3.88-36	-2.25-34				
11	1.81-27	1.65-37	2.22-37	3.81-37	7.31-37	1.53-36	3.52-36	7.62-36	-8.70-35					
10	2.47-27	2.30-37	3.21-37	5.86-37	1.24-36	3.03-36	8.52-36	-9.58-36						
9	3.53-27	3.35-37	4.93-37	9.90-37	2.45-36	7.81-36	2.62-35							
8	5.32-27	5.21-37	8.32-37	1.94-36	6.43-36	3.63-35								
7	8.63-27	8.89-37	1.62-36	5.04-36	3.34-35									
6	1.56-26	1.76-36	4.12-36	2.61-35										
5	3.39-26	4.53-36	2.02-35											
4	1.04-25	2.19-35												
3	7.97-25													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	3.43-38	3.94-38	4.44-38	4.89-38	5.20-38	5.30-38	5.03-38	4.20-38	2.53-38	-4.07-39	-5.17-38	-1.26-37	-2.38-37	-4.05-37
45	3.88-38	4.20-38	4.32-38	4.09-38	3.32-38	1.68-38	-1.29-38	-6.26-38	-1.42-37	-2.66-37	-4.57-37	-7.47-37	-1.19-36	-1.85-36
40	4.95-38	4.94-38	4.31-38	2.65-38	-6.80-39	-6.70-38	-1.70-37	-3.40-37	-6.18-37	-1.07-36	-1.79-36	-2.96-36	-4.88-36	-8.07-36
35	7.13-38	6.20-38	3.36-38	-2.86-38	-1.50-37	-3.74-37	-7.78-37	-1.50-36	-2.79-36	-5.13-36	-9.47-36	-1.78-35	-3.44-35	-7.00-35
30	1.09-37	5.54-38	-8.34-38	-3.94-37	-1.05-36	-2.44-36	-5.39-36	-1.19-35	-2.69-35	-6.80-35	-1.74-34	-5.59-34	-2.50-33	-2.51-32
29	1.17-37	3.77-38	-1.66-37	-6.33-37	-1.66-36	-3.92-36	-9.03-36	-2.12-35	-5.26-35	-1.45-34	-4.76-34	-2.18-33	-2.25-32	
28	1.22-37	2.09-39	-3.08-37	-1.04-36	-2.72-36	-6.66-36	-1.63-35	-4.19-35	-1.19-34	-4.00-34	-1.89-33	-2.01-32		
27	1.20-37	-6.72-38	-5.60-37	-1.77-36	-4.73-36	-1.22-35	-3.26-35	-9.55-35	-3.32-34	-1.62-33	-1.77-32			
26	1.04-37	-2.02-37	-1.03-36	-3.17-36	-8.84-36	-2.48-35	-7.54-35	-2.72-34	-1.37-33	-1.56-32				
25	5.39-38	-4.73-37	-1.96-36	-6.11-36	-1.83-35	-5.84-35	-2.19-34	-1.14-33	-1.35-32					
24	-6.97-38	-1.04-36	-3.97-36	-1.30-35	-4.40-35	-1.72-34	-9.38-34	-1.16-32						
23	-3.67-37	-2.32-36	-8.81-36	-3.21-35	-1.33-34	-7.59-34	-9.88-33							
22	-1.10-36	-5.55-36	-2.26-35	-9.98-35	-6.02-34	-8.27-33								
21	-3.09-36	-1.50-35	-7.26-35	-4.66-34	-6.81-33									
20	-9.25-36	-5.07-35	-3.51-34	-5.50-33										
19	-3.35-35	-2.57-34	-4.34-33											
18	-1.80-34	-3.33-33												
17	-2.48-33													

HE + TE = 1.00+05 NE = 1.00+03 CASE B NC = 70

TOTAL RC = 2.340-13 4-3 RC = 2.709-14 4-3 EM = 1.148-25 2S RC = 8.524-14 2P RC = 1.488-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.66-03	5.04-04	2.23-04	1.19-04	7.17-05	4.64-05	3.18-05	2.28-05	1.69-05	1.28-05	1.00-05	7.94-06	6.41-06	5.25-06
45	2.23-03	6.82-04	3.05-04	1.64-04	9.85-05	6.40-05	4.39-05	3.15-05	2.33-05	1.77-05	1.38-05	1.10-05	8.85-06	7.24-06
40	3.12-03	9.63-04	4.33-04	2.34-04	1.41-04	9.15-05	6.28-05	4.50-05	3.33-05	2.54-05	1.98-05	1.57-05	1.27-05	1.04-05
35	4.60-03	1.43-03	6.46-04	3.49-04	2.11-04	1.37-04	9.41-05	6.74-05	4.99-05	3.80-05	2.96-05	2.35-05	1.89-05	1.55-05
30	7.26-03	2.27-03	1.03-03	5.55-04	3.35-04	2.18-04	1.50-04	1.07-04	7.94-05	6.04-05	4.70-05	3.73-05	3.01-05	2.46-05
29	8.03-03	2.51-03	1.14-03	6.15-04	3.71-04	2.41-04	1.66-04	1.19-04	8.79-05	6.69-05	5.20-05	4.13-05	3.33-05	2.72-05
28	8.92-03	2.79-03	1.26-03	6.83-04	4.12-04	2.68-04	1.84-04	1.32-04	9.76-05	7.43-05	5.78-05	4.58-05	3.69-05	3.02-05
27	9.94-03	3.11-03	1.41-03	7.62-04	4.60-04	2.99-04	2.05-04	1.47-04	1.09-04	8.28-05	6.44-05	5.11-05	4.12-05	3.36-05
26	1.11-02	3.48-03	1.58-03	8.53-04	5.15-04	3.35-04	2.30-04	1.65-04	1.22-04	9.27-05	7.21-05	5.72-05	4.61-05	3.76-05
25	1.25-02	3.92-03	1.77-03	9.60-04	5.79-04	3.77-04	2.59-04	1.85-04	1.37-04	1.04-04	8.11-05	6.43-05	5.18-05	4.22-05
24	1.42-02	4.43-03	2.00-03	1.08-03	6.55-04	4.26-04	2.92-04	2.09-04	1.55-04	1.18-04	9.16-05	7.26-05	5.84-05	4.77-05
23	1.61-02	5.03-03	2.28-03	1.23-03	7.44-04	4.84-04	3.32-04	2.38-04	1.76-04	1.34-04	1.04-04	8.24-05	6.63-05	5.40-05
22	1.84-02	5.75-03	2.60-03	1.41-03	8.50-04	5.53-04	3.79-04	2.72-04	2.01-04	1.53-04	1.19-04	9.40-05	7.56-05	6.15-05
21	2.12-02	6.61-03	2.99-03	1.62-03	9.77-04	6.35-04	4.36-04	3.12-04	2.31-04	1.76-04	1.36-04	1.08-04	8.66-05	7.04-05
20	2.45-02	7.66-03	3.46-03	1.87-03	1.13-03	7.36-04	5.05-04	3.61-04	2.67-04	2.03-04	1.58-04	1.25-04	9.98-05	8.09-05
19	2.86-02	8.93-03	4.04-03	2.19-03	1.32-03	8.58-04	5.89-04	4.21-04	3.12-04	2.37-04	1.83-04	1.45-04	1.16-04	9.33-05
18	3.37-02	1.05-02	4.75-03	2.57-03	1.55-03	1.01-03	6.92-04	4.95-04	3.66-04	2.78-04	2.15-04	1.69-04	1.35-04	1.08-04
17	4.00-02	1.25-02	5.64-03	3.05-03	1.84-03	1.20-03	8.22-04	5.88-04	4.34-04	3.29-04	2.54-04	1.99-04	1.57-04	1.23-04
16	4.81-02	1.50-02	6.77-03	3.66-03	2.21-03	1.44-03	9.85-04	7.04-04	5.19-04	3.92-04	3.02-04	2.35-04	1.82-04	1.33-04
15	5.84-02	1.82-02	8.22-03	4.45-03	2.68-03	1.74-03	1.19-03	8.53-04	6.27-04	4.72-04	3.61-04	2.75-04	1.99-04	
14	7.20-02	2.24-02	1.01-02	5.47-03	3.30-03	2.14-03	1.47-03	1.05-03	7.66-04	5.73-04	4.29-04	3.06-04		
13	9.01-02	2.80-02	1.27-02	6.84-03	4.12-03	2.68-03	1.83-03	1.30-03	9.45-04	6.93-04	4.86-04			
12	1.15-01	3.57-02	1.61-02	8.71-03	5.24-03	3.40-03	2.31-03	1.63-03	1.17-03	8.02-04				
11	1.50-01	4.64-02	2.09-02	1.13-02	6.81-03	4.40-03	2.98-03	2.06-03	1.38-03					
10	2.01-01	6.20-02	2.79-02	1.51-02	9.04-03	5.81-03	3.87-03	2.52-03						
9	2.77-01	8.53-02	3.84-02	2.07-02	1.23-02	7.81-03	4.89-03							
8	3.99-01	1.22-01	5.49-02	2.94-02	1.73-02	1.03-02								
7	6.04-01	1.84-01	8.21-02	4.34-02	2.42-02									
6	9.63-01	2.96-01	1.30-01	6.52-02										
5	1.77+00	5.18-01	2.16-01											
4	3.70+00	1.00+00												
3	1.01+01													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.35-06	3.64-06	3.08-06	2.63-06	2.26-06	1.96-06	1.71-06	1.50-06	1.32-06	1.17-06	1.04-06	9.30-07	8.34-07	7.51-07
45	6.00-06	5.03-06	4.25-06	3.63-06	3.12-06	2.70-06	2.35-06	2.06-06	1.82-06	1.61-06	1.43-06	1.28-06	1.14-06	1.03-06
40	8.58-06	7.18-06	6.07-06	5.18-06	4.45-06	3.85-06	3.35-06	2.94-06	2.58-06	2.29-06	2.03-06	1.81-06	1.62-06	1.45-06
35	1.28-05	1.07-05	9.07-06	7.73-06	6.63-06	5.73-06	4.99-06	4.36-06	3.83-06	3.38-06	3.00-06	2.66-06	2.37-06	2.12-06
30	2.03-05	1.70-05	1.43-05	1.22-05	1.05-05	9.02-06	7.82-06	6.81-06	5.95-06	5.21-06	4.56-06	3.98-06	3.41-06	2.76-06
29	2.25-05	1.88-05	1.59-05	1.35-05	1.15-05	9.95-06	8.61-06	7.49-06	6.52-06	5.69-06	4.93-06	4.22-06	3.39-06	
28	2.50-05	2.08-05	1.76-05	1.49-05	1.28-05	1.10-05	9.50-06	8.24-06	7.14-06	6.17-06	5.25-06	4.21-06		
27	2.78-05	2.32-05	1.96-05	1.66-05	1.42-05	1.22-05	1.05-05	9.06-06	7.79-06	6.60-06	5.26-06			
26	3.11-05	2.59-05	2.18-05	1.85-05	1.58-05	1.35-05	1.16-05	9.92-06	8.36-06	6.64-06				
25	3.49-05	2.91-05	2.45-05	2.07-05	1.76-05	1.50-05	1.28-05	1.07-05	8.45-06					
24	3.93-05	3.27-05	2.75-05	2.32-05	1.96-05	1.66-05	1.38-05	1.09-05						
23	4.45-05	3.70-05	3.10-05	2.60-05	2.18-05	1.81-05	1.41-05							
22	5.06-05	4.19-05	3.49-05	2.91-05	2.39-05	1.86-05								
21	5.77-05	4.77-05	3.94-05	3.21-05	2.47-05									
20	6.61-05	5.41-05	4.38-05	3.34-05										
19	7.56-05	6.06-05	4.59-05											
18	8.56-05	6.42-05												
17	9.15-05													

HE + TE = 1.00+05 NE = 1.00+03 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.80-30	1.53-39	1.86-39	2.64-39	3.86-39	5.64-39	8.19-39	1.18-38	1.68-38	2.36-38	3.28-38	4.51-38	6.12-38	8.23-38
45	2.48-30	2.07-39	2.49-39	3.52-39	5.09-39	7.31-39	1.04-38	1.45-38	2.01-38	2.74-38	3.69-38	4.92-38	6.49-38	8.50-38
40	3.54-30	2.91-39	3.46-39	4.84-39	6.91-39	9.77-39	1.36-38	1.85-38	2.49-38	3.30-38	4.31-38	5.56-38	7.10-38	8.96-38
35	5.30-30	4.31-39	5.09-39	7.07-39	1.00-38	1.40-38	1.92-38	2.59-38	3.42-38	4.44-38	5.67-38	7.11-38	8.76-38	1.06-37
30	8.45-30	6.84-39	8.07-39	1.12-38	1.59-38	2.24-38	3.08-38	4.15-38	5.49-38	7.11-38	9.01-38	1.12-37	1.34-37	1.53-37
29	9.37-30	7.58-39	8.95-39	1.25-38	1.77-38	2.49-38	3.44-38	4.65-38	6.16-38	8.00-38	1.02-37	1.26-37	1.50-37	1.69-37
28	1.04-29	8.43-39	9.97-39	1.39-38	1.98-38	2.79-38	3.87-38	5.25-38	6.98-38	9.10-38	1.16-37	1.43-37	1.70-37	1.89-37
27	1.16-29	9.42-39	1.11-38	1.56-38	2.23-38	3.15-38	4.38-38	5.97-38	7.98-38	1.04-37	1.33-37	1.65-37	1.95-37	2.13-37
26	1.31-29	1.06-38	1.25-38	1.76-38	2.52-38	3.58-38	4.99-38	6.84-38	9.20-38	1.21-37	1.55-37	1.93-37	2.26-37	2.40-37
25	1.47-29	1.19-38	1.42-38	1.99-38	2.86-38	4.09-38	5.74-38	7.92-38	1.07-37	1.42-37	1.83-37	2.27-37	2.65-37	2.70-37
24	1.67-29	1.35-38	1.61-38	2.27-38	3.28-38	4.71-38	6.66-38	9.25-38	1.26-37	1.68-37	2.19-37	2.72-37	3.13-37	2.98-37
23	1.90-29	1.54-38	1.84-38	2.60-38	3.78-38	5.47-38	7.79-38	1.09-37	1.50-37	2.03-37	2.65-37	3.30-37	3.72-37	3.14-37
22	2.18-29	1.77-38	2.11-38	3.01-38	4.40-38	6.41-38	9.22-38	1.31-37	1.82-37	2.48-37	3.27-37	4.07-37	4.41-37	2.81-37
21	2.51-29	2.04-38	2.45-38	3.51-38	5.17-38	7.60-38	1.10-37	1.58-37	2.23-37	3.08-37	4.11-37	5.07-37	5.08-37	9.64-38
20	2.92-29	2.38-38	2.86-38	4.12-38	6.13-38	9.11-38	1.34-37	1.95-37	2.80-37	3.92-37	5.27-37	6.38-37	5.31-37	-5.76-37
19	3.42-29	2.79-38	3.38-38	4.90-38	7.36-38	1.11-37	1.66-37	2.45-37	3.56-37	5.11-37	6.91-37	7.96-37	3.38-37	-3.02-36
18	4.08-29	3.31-38	4.03-38	5.89-38	8.95-38	1.37-37	2.08-37	3.15-37	4.71-37	6.85-37	9.25-37	9.24-37	-8.09-37	-1.35-35
17	4.83-29	3.96-38	4.86-38	7.18-38	1.11-37	1.72-37	2.68-37	4.16-37	6.40-37	9.52-37	1.25-36	6.85-37	-6.82-36	-7.98-35
16	5.83-29	4.80-38	5.94-38	8.89-38	1.40-37	2.22-37	3.56-37	5.71-37	9.08-37	1.38-36	1.59-36	-2.06-36	-4.93-35	-1.13-33
15	7.14-29	5.91-38	7.38-38	1.12-37	1.80-37	2.95-37	4.89-37	8.18-37	1.36-36	2.05-36	1.06-36	-2.66-35	-7.83-34	
14	8.88-29	7.39-38	9.34-38	1.45-37	2.39-37	4.05-37	7.05-37	1.25-36	2.17-36	2.88-36	-1.06-35	-5.06-34		
13	1.12-28	9.41-38	1.21-37	1.92-37	3.28-37	5.85-37	1.08-36	2.07-36	3.72-36	-2.06-37	-2.97-34			
12	1.45-28	1.23-37	1.61-37	2.64-37	4.74-37	9.03-37	1.83-36	3.86-36	5.71-36	-1.48-34				
11	1.93-28	1.65-37	2.22-37	3.81-37	7.30-37	1.53-36	3.56-36	8.34-36	-5.08-35					
10	2.64-28	2.30-37	3.21-37	5.86-37	1.24-36	3.03-36	8.75-36	5.28-36						
9	3.77-28	3.35-37	4.93-37	9.89-37	2.45-36	7.86-36	3.12-35							
8	5.68-28	5.21-37	8.32-37	1.94-36	6.44-36	3.77-35								
7	9.22-28	8.90-37	1.62-36	5.04-36	3.36-35									
6	1.67-27	1.76-36	4.12-36	2.61-35										
5	3.62-27	4.53-36	2.01-35											
4	1.11-26	2.19-35												
3	8.52-26													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	1.10-37	1.45-37	1.90-37	2.47-37	3.19-37	4.11-37	5.26-37	6.71-37	8.54-37	1.08-36	1.37-36	1.74-36	2.20-36	2.79-36
45	1.10-37	1.42-37	1.82-37	2.32-37	2.95-37	3.72-37	4.69-37	5.89-37	7.39-37	9.24-37	1.15-36	1.44-36	1.80-36	2.24-36
40	1.12-37	1.39-37	1.70-37	2.06-37	2.47-37	2.92-37	3.39-37	3.84-37	4.19-37	4.30-37	3.90-37	2.52-37	-7.16-38	-7.42-37
35	1.25-37	1.42-37	1.55-37	1.55-37	1.32-37	6.26-38	-8.95-38	-3.95-37	-9.80-37	-2.09-36	-4.20-36	-8.32-36	-1.67-35	-3.46-35
30	1.62-37	1.47-37	7.91-38	-9.85-38	-4.99-37	-1.36-36	-3.20-36	-7.21-36	-1.64-35	-3.92-35	-1.03-34	-2.26-34	-1.45-33	-1.50-32
29	1.74-37	1.40-37	2.57-38	-2.62-37	-9.17-37	-2.37-36	-5.63-36	-1.33-35	-3.25-35	-8.78-35	-2.82-34	-1.28-33	-1.33-32	
28	1.85-37	1.23-37	-6.78-38	-5.42-37	-1.65-36	-4.23-36	-1.04-35	-2.65-35	-7.34-35	-2.41-34	-1.12-33	-1.20-32		
27	1.94-37	8.39-38	-2.37-37	-1.05-36	-3.03-36	-7.96-36	-2.11-35	-6.03-35	-2.04-34	-9.64-34	-1.06-32			
26	1.95-37	1.21-39	-5.57-37	-2.02-36	-5.83-36	-1.63-35	-4.85-35	-1.69-34	-8.23-34	-9.31-33				
25	1.77-37	-1.73-37	-1.20-36	-4.05-36	-1.22-35	-3.82-35	-1.38-34	-6.94-34	-8.09-33					
24	1.13-37	-5.53-37	-2.59-36	-8.76-36	-2.92-35	-1.11-34	-5.07-34	-6.96-33						
23	-6.64-38	-1.43-36	-5.92-36	-2.16-35	-8.66-35	-4.72-34	-5.92-33							
22	-5.45-37	-3.64-36	-1.53-35	-6.59-35	-3.79-34	-4.97-33								
21	-1.88-36	-1.01-35	-4.85-35	-2.97-34	-4.11-33									
20	-6.08-36	-3.41-35	-2.27-34	-3.35-33										
19	-2.25-35	-1.68-34	-2.67-33											
18	-1.19-34	-2.07-33												
17	-1.56-33													

HE + TE = 1.00+05 NE = 1.00+04 CASE B NC = 70

TOTAL RC = 2.340-13 4-3 RC = 2.706-14 4-3 EM = 1.147-25 2S RC = 8.525-14 2P RC = 1.488-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.77-03	5.41-04	2.35-04	1.23-04	7.29-05	4.67-05	3.17-05	2.25-05	1.66-05	1.26-05	9.75-06	7.72-06	6.21-06	5.08-06
45	2.37-03	7.24-04	3.16-04	1.67-04	9.89-05	6.36-05	4.34-05	3.09-05	2.28-05	1.73-05	1.34-05	1.07-05	8.59-06	7.02-06
40	3.31-03	1.00-03	4.41-04	2.34-04	1.40-04	9.04-05	6.18-05	4.42-05	3.27-05	2.48-05	1.93-05	1.53-05	1.24-05	1.01-05
35	4.81-03	1.46-03	6.56-04	3.48-04	2.09-04	1.35-04	9.29-05	6.65-05	4.92-05	3.74-05	2.91-05	2.31-05	1.86-05	1.52-05
30	7.44-03	2.29-03	1.03-03	5.53-04	3.33-04	2.16-04	1.49-04	1.06-04	7.88-05	5.99-05	4.66-05	3.70-05	2.98-05	2.43-05
29	8.20-03	2.53-03	1.14-03	6.13-04	3.69-04	2.40-04	1.65-04	1.18-04	8.73-05	6.64-05	5.17-05	4.10-05	3.30-05	2.70-05
28	9.08-03	2.81-03	1.26-03	6.81-04	4.11-04	2.67-04	1.83-04	1.31-04	9.71-05	7.39-05	5.74-05	4.55-05	3.67-05	3.00-05
27	1.01-02	3.13-03	1.41-03	7.60-04	4.58-04	2.98-04	2.04-04	1.46-04	1.08-04	8.24-05	6.41-05	5.08-05	4.09-05	3.34-05
26	1.13-02	3.50-03	1.58-03	8.52-04	5.14-04	3.34-04	2.29-04	1.64-04	1.21-04	9.23-05	7.18-05	5.69-05	4.58-05	3.74-05
25	1.26-02	3.93-03	1.77-03	9.59-04	5.78-04	3.76-04	2.58-04	1.85-04	1.37-04	1.04-04	8.08-05	6.40-05	5.15-05	4.20-05
24	1.43-02	4.44-03	2.01-03	1.08-03	6.54-04	4.25-04	2.92-04	2.09-04	1.55-04	1.17-04	9.13-05	7.23-05	5.81-05	4.74-05
23	1.62-02	5.04-03	2.28-03	1.23-03	7.43-04	4.83-04	3.32-04	2.37-04	1.76-04	1.33-04	1.04-04	8.20-05	6.59-05	5.37-05
22	1.85-02	5.76-03	2.60-03	1.41-03	8.50-04	5.52-04	3.79-04	2.71-04	2.01-04	1.52-04	1.18-04	9.36-05	7.52-05	6.12-05
21	2.12-02	6.62-03	2.99-03	1.62-03	9.77-04	6.35-04	4.36-04	3.12-04	2.31-04	1.75-04	1.36-04	1.07-04	8.62-05	7.00-05
20	2.46-02	7.67-03	3.47-03	1.88-03	1.13-03	7.35-04	5.05-04	3.61-04	2.67-04	2.03-04	1.57-04	1.24-04	9.93-05	8.04-05
19	2.87-02	8.95-03	4.05-03	2.19-03	1.32-03	8.58-04	5.88-04	4.21-04	3.11-04	2.36-04	1.83-04	1.44-04	1.15-04	9.28-05
18	3.37-02	1.05-02	4.76-03	2.57-03	1.55-03	1.01-03	6.92-04	4.95-04	3.65-04	2.77-04	2.14-04	1.69-04	1.34-04	1.07-04
17	4.01-02	1.25-02	5.65-03	3.06-03	1.84-03	1.20-03	8.21-04	5.87-04	4.33-04	3.27-04	2.53-04	1.98-04	1.56-04	1.22-04
16	4.81-02	1.50-02	6.78-03	3.67-03	2.21-03	1.44-03	9.84-04	7.03-04	5.18-04	3.91-04	3.00-04	2.33-04	1.81-04	1.33-04
15	5.85-02	1.82-02	8.23-03	4.45-03	2.68-03	1.74-03	1.19-03	8.51-04	6.26-04	4.70-04	3.59-04	2.73-04	1.93-04	
14	7.21-02	2.24-02	1.01-02	5.48-03	3.30-03	2.14-03	1.47-03	1.04-03	7.64-04	5.70-04	4.27-04	3.04-04		
13	9.02-02	2.80-02	1.27-02	6.85-03	4.13-03	2.67-03	1.83-03	1.29-03	9.41-04	6.90-04	4.83-04			
12	1.15-01	3.57-02	1.61-02	8.71-03	5.24-03	3.39-03	2.31-03	1.63-03	1.16-03	7.97-04				
11	1.50-01	4.65-02	2.10-02	1.13-02	6.81-03	4.39-03	2.97-03	2.06-03	1.38-03					
10	2.01-01	6.20-02	2.80-02	1.51-02	9.04-03	5.80-03	3.86-03	2.50-03						
9	2.78-01	8.55-02	3.84-02	2.07-02	1.23-02	7.79-03	4.87-03							
8	3.99-01	1.22-01	5.49-02	2.94-02	1.73-02	1.03-02								
7	6.05-01	1.84-01	8.22-02	4.34-02	2.41-02									
6	9.84-01	2.96-01	1.30-01	6.51-02										
5	1.77+00	5.18-01	2.16-01											
4	3.71+00	1.00+00												
3	1.01+01													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.20-06	3.52-06	2.97-06	2.53-06	2.18-06	1.89-06	1.64-06	1.44-06	1.27-06	1.13-06	1.00-06	8.95-07	8.03-07	7.23-07
45	5.82-06	4.87-06	4.12-06	3.51-06	3.02-06	2.62-06	2.28-06	2.00-06	1.76-06	1.56-06	1.39-06	1.24-06	1.11-06	1.00-06
40	8.38-06	7.01-06	5.93-06	5.06-06	4.35-06	3.76-06	3.28-06	2.87-06	2.53-06	2.24-06	1.99-06	1.77-06	1.59-06	1.43-06
35	1.26-05	1.06-05	8.93-06	7.61-06	6.54-06	5.65-06	4.92-06	4.30-06	3.78-06	3.34-06	2.96-06	2.63-06	2.35-06	2.10-06
30	2.01-05	1.68-05	1.42-05	1.21-05	1.04-05	8.93-06	7.74-06	6.74-06	5.90-06	5.16-06	4.52-06	3.95-06	3.40-06	2.75-06
29	2.23-05	1.86-05	1.57-05	1.34-05	1.14-05	9.65-06	8.53-06	7.42-06	6.47-06	5.64-06	4.90-06	4.20-06	3.39-06	
28	2.48-05	2.07-05	1.74-05	1.48-05	1.27-05	1.09-05	9.42-06	8.17-06	7.09-06	6.13-06	5.23-06	4.20-06		
27	2.76-05	2.30-05	1.94-05	1.65-05	1.41-05	1.21-05	1.04-05	8.99-06	7.73-06	6.57-06	5.26-06			
26	3.09-05	2.57-05	2.17-05	1.84-05	1.57-05	1.34-05	1.15-05	9.85-06	8.32-06	6.63-06				
25	3.47-05	2.89-05	2.43-05	2.05-05	1.75-05	1.49-05	1.27-05	1.06-05	8.43-06					
24	3.91-05	3.25-05	2.73-05	2.30-05	1.95-05	1.65-05	1.38-05	1.08-05						
23	4.42-05	3.67-05	3.07-05	2.58-05	2.17-05	1.80-05	1.41-05							
22	5.03-05	4.17-05	3.47-05	2.89-05	2.38-05	1.85-05								
21	5.74-05	4.73-05	3.91-05	3.19-05	2.47-05									
20	6.56-05	5.37-05	4.35-05	3.33-05										
19	7.51-05	6.02-05	4.58-05											
18	8.50-05	6.39-05												
17	9.11-05													

HE + TE = 1.00+05 NE = 1.00+04 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.96-31	1.60-39	1.91-39	2.59-39	3.64-39	5.29-39	8.00-39	1.24-38	1.96-38	3.08-38	4.78-38	7.32-38	1.10-37	1.62-37
45	2.70-31	2.18-39	2.65-39	3.70-39	5.36-39	7.96-39	1.21-38	1.85-38	2.85-38	4.36-38	6.61-38	9.87-38	1.45-37	2.11-37
40	3.85-31	3.07-39	3.75-39	5.35-39	7.90-39	1.18-38	1.78-38	2.67-38	4.00-38	5.94-38	8.74-38	1.27-37	1.83-37	2.60-37
35	5.76-31	4.49-39	5.48-39	7.85-39	1.16-38	1.72-38	2.53-38	3.69-38	5.34-38	7.65-38	1.09-37	1.53-37	2.15-37	2.99-37
30	9.19-31	7.01-39	8.44-39	1.20-38	1.75-38	2.54-38	3.65-38	5.16-38	7.20-38	9.94-38	1.36-37	1.84-37	2.48-37	3.32-37
29	1.02-30	7.74-39	9.30-39	1.32-38	1.92-38	2.78-38	3.97-38	5.59-38	7.76-38	1.06-37	1.45-37	1.94-37	2.59-37	3.42-37
28	1.13-30	8.58-39	1.03-38	1.46-38	2.12-38	3.06-38	4.36-38	6.11-38	8.44-38	1.15-37	1.55-37	2.07-37	2.72-37	3.54-37
27	1.27-30	9.56-39	1.15-38	1.62-38	2.36-38	3.40-38	4.82-38	6.74-38	9.28-38	1.26-37	1.69-37	2.23-37	2.89-37	3.68-37
26	1.42-30	1.07-38	1.28-38	1.81-38	2.63-38	3.79-38	5.38-38	7.52-38	1.03-37	1.40-37	1.86-37	2.43-37	3.11-37	3.84-37
25	1.60-30	1.20-38	1.44-38	2.04-38	2.96-38	4.27-38	6.07-38	8.48-38	1.16-37	1.57-37	2.09-37	2.70-37	3.39-37	4.01-37
24	1.81-30	1.36-38	1.63-38	2.31-38	3.36-38	4.86-38	6.92-38	9.69-38	1.33-37	1.80-37	2.38-37	3.05-37	3.73-37	4.15-37
23	2.07-30	1.55-38	1.86-38	2.64-38	3.85-38	5.59-38	7.99-38	1.12-37	1.55-37	2.10-37	2.77-37	3.52-37	4.15-37	4.14-37
22	2.37-30	1.78-38	2.13-38	3.04-38	4.45-38	6.50-38	9.34-38	1.32-37	1.84-37	2.50-37	3.30-37	4.13-37	4.62-37	3.65-37
21	2.73-30	2.05-38	2.47-38	3.53-38	5.20-38	7.64-38	1.11-37	1.58-37	2.22-37	3.04-37	4.01-37	4.92-37	5.02-37	1.77-37
20	3.17-30	2.38-38	2.88-38	4.14-38	6.15-38	9.11-38	1.34-37	1.93-37	2.74-37	3.78-37	5.00-37	5.93-37	4.91-37	-4.36-37
19	3.72-30	2.80-38	3.39-38	4.91-38	7.36-38	1.10-37	1.64-37	2.40-37	3.46-37	4.84-37	6.38-37	7.07-37	2.71-37	-2.51-36
18	4.40-30	3.31-38	4.03-38	5.90-38	8.93-38	1.36-37	2.05-37	3.06-37	4.50-37	6.39-37	8.31-37	7.74-37	-7.86-37	-1.09-35
17	5.25-30	3.97-38	4.86-38	7.18-38	1.10-37	1.70-37	2.63-37	4.02-37	6.05-37	8.72-37	1.09-36	4.79-37	-5.82-36	-5.95-35
16	6.34-30	4.81-38	5.94-38	8.88-38	1.39-37	2.19-37	3.47-37	5.48-37	8.49-37	1.24-36	1.32-36	-2.00-36	-3.84-35	-7.46-34
15	7.77-30	5.91-38	7.38-38	1.12-37	1.79-37	2.90-37	4.75-37	7.80-37	1.25-36	1.79-36	7.03-37	-2.18-35	-5.40-34	
14	9.66-30	7.39-38	9.34-38	1.44-37	2.37-37	3.98-37	6.82-37	1.18-36	1.97-36	2.41-36	-9.28-36	-3.66-34		
13	1.22-29	9.42-38	1.21-37	1.92-37	3.25-37	5.74-37	1.04-36	1.93-36	3.29-36	-6.07-37	-2.27-34			
12	1.58-29	1.23-37	1.61-37	2.63-37	4.69-37	8.83-37	1.75-36	3.55-36	4.75-36	-1.20-34				
11	2.10-29	1.65-37	2.22-37	3.79-37	7.21-37	1.49-36	3.36-36	7.42-36	-4.47-35					
10	2.88-29	2.30-37	3.20-37	5.83-37	1.22-36	2.93-36	8.11-36	2.73-36						
9	4.10-29	3.35-37	4.93-37	9.83-37	2.41-36	7.51-36	2.71-35							
8	6.18-29	5.21-37	8.30-37	1.93-36	6.28-36	3.47-35								
7	1.00-28	8.90-37	1.62-36	4.98-36	3.22-35									
6	1.82-28	1.76-36	4.11-36	2.56-35										
5	3.94-28	4.53-36	2.00-35											
4	1.21-27	2.19-35												
3	9.25-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.35-37	3.36-37	4.72-37	6.57-37	9.03-37	1.23-36	1.66-36	2.23-36	2.98-36	3.95-36	5.23-36	6.90-36	9.10-36	1.20-35
45	3.02-37	4.27-37	5.97-37	8.28-37	1.14-36	1.56-36	2.11-36	2.86-36	3.85-36	5.19-36	6.98-36	9.41-36	1.27-35	1.72-35
40	3.67-37	5.14-37	7.15-37	9.89-37	1.36-36	1.87-36	2.56-36	3.52-36	4.83-36	6.65-36	9.20-36	1.28-35	1.80-35	2.57-35
35	4.14-37	5.72-37	7.89-37	1.09-36	1.50-36	2.08-36	2.89-36	4.04-36	5.70-36	8.13-36	1.18-35	1.74-35	2.63-35	4.15-35
30	4.43-37	5.87-37	7.74-37	1.01-36	1.31-36	1.65-36	1.99-36	2.13-36	1.43-36	-2.13-36	-1.60-35	-7.34-35	-3.88-34	-4.13-33
29	4.48-37	5.80-37	7.40-37	9.29-37	1.09-36	1.16-36	8.62-37	-5.50-37	-5.41-36	-2.19-35	-8.55-35	-4.22-34	-4.38-33	
28	4.52-37	5.65-37	6.76-37	7.47-37	6.69-37	1.52-37	-1.60-36	-6.99-36	-2.43-35	-8.93-35	-4.28-34	-4.40-33		
27	4.54-37	5.31-37	5.56-37	4.17-37	-1.72-37	-2.00-36	-7.39-36	-2.44-35	-8.74-35	-4.15-34	-4.27-33			
26	4.48-37	4.61-37	3.21-37	-2.41-37	-1.95-36	-6.99-36	-2.28-35	-8.16-35	-3.88-34	-4.03-33				
25	4.24-37	3.17-37	-1.56-37	-1.64-36	-6.08-36	-2.02-35	-7.32-35	-3.53-34	-3.71-33					
24	3.58-37	7.00-39	-1.19-36	-4.91-36	-1.70-35	-6.34-35	-3.12-34	-3.36-33						
23	1.93-37	-6.95-37	-3.65-36	-1.37-35	-5.32-35	-2.70-34	-2.98-33							
22	-2.26-37	-2.43-36	-1.04-35	-4.30-35	-2.28-34	-2.61-33								
21	-1.35-36	-7.36-36	-3.34-35	-1.87-34	-2.24-33									
20	-4.71-36	-2.47-35	-1.49-34	-1.89-33										
19	-1.72-35	-1.15-34	-1.56-33											
18	-8.51-35	-1.26-33												
17	-3.86-34													

HE + TE = 1.00+05 NE = 1.00+05 CASE B NC = 70

TOTAL RC = 2.341-13 4-3 RC = 2.700-14 4-3 EM = 1.144-25 2S RC = 8.526-14 2P RC = 1.488-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.88-03	5.76-04	2.48-04	1.29-04	7.55-05	4.79-05	3.23-05	2.28-05	1.67-05	1.26-05	9.74-06	7.68-06	6.16-06	5.02-06
45	2.53-03	7.76-04	3.35-04	1.74-04	1.02-04	6.50-05	4.39-05	3.10-05	2.27-05	1.72-05	1.33-05	1.05-05	8.41-06	6.86-06
40	3.52-03	1.08-03	4.67-04	2.44-04	1.44-04	9.15-05	6.20-05	4.39-05	3.22-05	2.44-05	1.89-05	1.49-05	1.20-05	9.78-06
35	5.11-03	1.56-03	6.80-04	3.57-04	2.11-04	1.35-04	9.19-05	6.53-05	4.81-05	3.65-05	2.83-05	2.28-05	1.80-05	1.47-05
30	7.91-03	2.40-03	1.05-03	5.57-04	3.32-04	2.14-04	1.46-04	1.04-04	7.69-05	5.84-05	4.54-05	3.59-05	2.90-05	2.37-05
29	8.70-03	2.64-03	1.16-03	6.15-04	3.67-04	2.37-04	1.62-04	1.15-04	8.53-05	6.48-05	5.04-05	3.99-05	3.21-05	2.62-05
28	9.61-03	2.91-03	1.28-03	6.82-04	4.07-04	2.63-04	1.80-04	1.29-04	9.50-05	7.22-05	5.61-05	4.44-05	3.58-05	2.92-05
27	1.06-02	3.22-03	1.42-03	7.59-04	4.54-04	2.94-04	2.01-04	1.44-04	1.06-04	8.07-05	6.27-05	4.97-05	4.00-05	3.27-05
26	1.18-02	3.59-03	1.59-03	8.49-04	5.09-04	3.30-04	2.26-04	1.61-04	1.19-04	9.06-05	7.04-05	5.58-05	4.49-05	3.66-05
25	1.32-02	4.01-03	1.78-03	9.55-04	5.73-04	3.71-04	2.54-04	1.82-04	1.35-04	1.02-04	7.94-05	6.29-05	5.06-05	4.13-05
24	1.48-02	4.52-03	2.01-03	1.08-03	6.49-04	4.21-04	2.88-04	2.06-04	1.52-04	1.16-04	8.99-05	7.12-05	5.72-05	4.66-05
23	1.67-02	5.11-03	2.28-03	1.23-03	7.38-04	4.79-04	3.28-04	2.35-04	1.74-04	1.32-04	1.02-04	8.09-05	6.50-05	5.29-05
22	1.90-02	5.82-03	2.61-03	1.40-03	8.45-04	5.48-04	3.76-04	2.69-04	1.99-04	1.51-04	1.17-04	9.25-05	7.42-05	6.03-05
21	2.17-02	6.68-03	3.00-03	1.62-03	9.73-04	6.31-04	4.33-04	3.09-04	2.29-04	1.73-04	1.35-04	1.06-04	8.52-05	6.91-05
20	2.50-02	7.72-03	3.47-03	1.87-03	1.13-03	7.32-04	5.02-04	3.59-04	2.65-04	2.01-04	1.56-04	1.23-04	9.82-05	7.95-05
19	2.91-02	8.99-03	4.05-03	2.19-03	1.32-03	8.55-04	5.86-04	4.19-04	3.09-04	2.34-04	1.81-04	1.43-04	1.14-04	9.17-05
18	3.41-02	1.06-02	4.76-03	2.57-03	1.55-03	1.01-03	6.89-04	4.92-04	3.63-04	2.75-04	2.12-04	1.67-04	1.32-04	1.06-04
17	4.04-02	1.25-02	5.66-03	3.06-03	1.84-03	1.20-03	8.19-04	5.84-04	4.30-04	3.25-04	2.51-04	1.96-04	1.54-04	1.21-04
16	4.84-02	1.50-02	6.79-03	3.67-03	2.21-03	1.43-03	9.82-04	7.00-04	5.15-04	3.88-04	2.98-04	2.31-04	1.79-04	1.31-04
15	5.87-02	1.83-02	8.25-03	4.46-03	2.68-03	1.74-03	1.19-03	8.48-04	6.22-04	4.67-04	3.55-04	2.70-04	1.96-04	
14	7.23-02	2.25-02	1.02-02	5.48-03	3.30-03	2.14-03	1.46-03	1.04-03	7.59-04	5.65-04	4.22-04	3.01-04		
13	9.05-02	2.81-02	1.27-02	6.85-03	4.13-03	2.67-03	1.82-03	1.29-03	9.35-04	6.83-04	4.78-04			
12	1.15-01	3.58-02	1.62-02	8.72-03	5.24-03	3.39-03	2.30-03	1.62-03	1.15-03	7.89-04				
11	1.50-01	4.66-02	2.10-02	1.13-02	6.80-03	4.38-03	2.96-03	2.04-03	1.36-03					
10	2.01-01	6.22-02	2.80-02	1.51-02	9.04-03	5.78-03	3.83-03	2.48-03						
9	2.78-01	8.57-02	3.85-02	2.07-02	1.23-02	7.76-03	4.83-03							
8	4.00-01	1.23-01	5.50-02	2.94-02	1.72-02	1.02-02								
7	6.07-01	1.85-01	8.23-02	4.34-02	2.39-02									
6	9.87-01	2.97-01	1.30-01	6.48-02										
5	1.77+00	5.19-01	2.15-01											
4	3.72+00	1.00+00												
3	1.01+01													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.15-06	3.46-06	2.92-06	2.49-06	2.13-06	1.84-06	1.61-06	1.41-06	1.24-06	1.10-06	9.74-07	8.70-07	7.80-07	7.02-07
45	5.66-06	4.73-06	3.99-06	3.40-06	2.92-06	2.52-06	2.20-06	1.92-06	1.69-06	1.50-06	1.33-06	1.19-06	1.07-06	9.60-07
40	8.08-06	6.76-06	5.70-06	4.86-06	4.17-06	3.61-06	3.14-06	2.75-06	2.42-06	2.14-06	1.90-06	1.70-06	1.52-06	1.37-06
35	1.22-05	1.02-05	8.59-06	7.32-06	6.29-06	5.44-06	4.73-06	4.14-06	3.64-06	3.22-06	2.85-06	2.54-06	2.27-06	2.03-06
30	1.96-05	1.64-05	1.38-05	1.17-05	1.01-05	8.69-06	7.54-06	6.57-06	5.75-06	5.05-06	4.43-06	3.87-06	3.34-06	2.72-06
29	2.17-05	1.81-05	1.53-05	1.30-05	1.12-05	9.61-06	8.33-06	7.25-06	6.33-06	5.53-06	4.81-06	4.13-06	3.35-06	
28	2.42-05	2.02-05	1.70-05	1.45-05	1.24-05	1.07-05	9.22-06	8.00-06	6.95-06	6.02-06	5.15-06	4.15-06		
27	2.70-05	2.25-05	1.90-05	1.61-05	1.38-05	1.18-05	1.02-05	8.82-06	7.60-06	6.47-06	5.19-06			
26	3.03-05	2.52-05	2.12-05	1.80-05	1.54-05	1.32-05	1.13-05	9.69-06	8.20-06	6.55-06				
25	3.40-05	2.84-05	2.38-05	2.02-05	1.72-05	1.46-05	1.25-05	1.05-05	8.34-06					
24	3.84-05	3.20-05	2.68-05	2.26-05	1.92-05	1.62-05	1.36-05	1.07-05						
23	4.36-05	3.62-05	3.03-05	2.54-05	2.14-05	1.77-05	1.39-05							
22	4.96-05	4.11-05	3.42-05	2.85-05	2.35-05	1.83-05								
21	5.66-05	4.67-05	3.86-05	3.15-05	2.44-05									
20	6.48-05	5.30-05	4.30-05	3.30-05										
19	7.42-05	5.95-05	4.53-05											
18	8.40-05	6.33-05												
17	9.02-05													

HE + TE = 1.00+05 NE = 1.00+05 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.41-32	1.58-39	1.79-39	2.19-39	2.68-39	3.40-39	4.73-39	7.34-39	1.23-38	2.10-38	3.56-38	5.90-38	9.48-38	1.48-37
45	3.31-32	2.19-39	2.53-39	3.22-39	4.19-39	5.70-39	8.41-39	1.34-38	2.22-38	3.74-38	6.21-38	1.01-37	1.61-37	2.49-37
40	4.72-32	3.14-39	3.72-39	4.94-39	6.78-39	9.73-39	1.48-38	2.37-38	3.89-38	6.41-38	1.05-37	1.68-37	2.64-37	4.08-37
35	7.07-32	4.71-39	5.71-39	7.92-39	1.14-38	1.71-38	2.65-38	4.22-38	6.80-38	1.10-37	1.75-37	2.76-37	4.30-37	6.61-37
30	1.13-31	7.42-39	9.14-39	1.32-38	1.97-38	3.02-38	4.70-38	7.38-38	1.16-37	1.82-37	2.84-37	4.40-37	6.79-37	1.04-36
29	1.25-31	8.19-39	1.01-38	1.46-38	2.20-38	3.38-38	5.25-38	8.19-38	1.28-37	2.00-37	3.10-37	4.79-37	7.38-37	1.13-36
28	1.39-31	9.06-39	1.12-38	1.63-38	2.46-38	3.77-38	5.84-38	9.07-38	1.41-37	2.18-37	3.37-37	5.19-37	7.99-37	1.23-36
27	1.55-31	1.01-38	1.24-38	1.81-38	2.74-38	4.21-38	6.49-38	1.00-37	1.54-37	2.38-37	3.65-37	5.61-37	8.61-37	1.33-36
26	1.74-31	1.12-38	1.39-38	2.02-38	3.07-38	4.69-38	7.20-38	1.10-37	1.69-37	2.58-37	3.95-37	6.04-37	9.26-37	1.43-36
25	1.96-31	1.26-38	1.55-38	2.27-38	3.43-38	5.24-38	7.99-38	1.22-37	1.85-37	2.81-37	4.26-37	6.50-37	9.95-37	1.54-36
24	2.23-31	1.41-38	1.74-38	2.55-38	3.85-38	5.86-38	8.89-38	1.34-37	2.03-37	3.06-37	4.62-37	7.00-37	1.07-36	1.65-36
23	2.53-31	1.60-38	1.97-38	2.88-38	4.34-38	6.58-38	9.94-38	1.49-37	2.24-37	3.35-37	5.02-37	7.56-37	1.15-36	1.77-36
22	2.90-31	1.82-38	2.24-38	3.27-38	4.93-38	7.45-38	1.12-37	1.68-37	2.49-37	3.71-37	5.51-37	8.23-37	1.24-36	1.87-36
21	3.35-31	2.09-38	2.57-38	3.75-38	5.65-38	8.53-38	1.28-37	1.91-37	2.83-37	4.17-37	6.15-37	9.05-37	1.33-36	1.92-36
20	3.89-31	2.42-38	2.97-38	4.34-38	6.55-38	9.89-38	1.48-37	2.21-37	3.27-37	4.80-37	6.99-37	1.00-36	1.39-36	1.74-36
19	4.56-31	2.83-38	3.47-38	5.08-38	7.70-38	1.17-37	1.76-37	2.63-37	3.89-37	5.68-37	8.14-37	1.11-36	1.33-36	6.76-37
18	5.39-31	3.34-38	4.11-38	6.04-38	9.20-38	1.41-37	2.13-37	3.21-37	4.78-37	6.96-37	9.71-37	1.19-36	6.80-37	-4.32-36
17	6.44-31	3.99-38	4.92-38	7.29-38	1.12-37	1.73-37	2.67-37	4.07-37	6.11-37	8.87-37	1.17-36	9.66-37	-2.74-36	-3.41-35
16	7.78-31	4.83-38	5.99-38	8.96-38	1.40-37	2.19-37	3.44-37	5.36-37	8.19-37	1.18-36	1.32-36	-9.49-37	-2 47-35	-4.27-34
15	9.53-31	5.93-38	7.41-38	1.12-37	1.78-37	2.87-37	4.63-37	7.43-37	1.16-36	1.60-36	6.84-37	-1.55-35	-3.32-34	
14	1.18-30	7.41-38	9.36-38	1.44-37	2.35-37	3.90-37	6.54-37	1.09-36	1.74-36	1.95-36	-7.44-36	-2.43-34		
13	1.50-30	9.43-38	1.21-37	1.91-37	3.21-37	5.57-37	9.07-37	1.75-36	2.75-36	-1.08-36	-1.63-34			
12	1.94-30	1.23-37	1.61-37	2.62-37	4.61-37	8.50-37	1.63-36	3.09-36	3.41-36	-9.42-35				
11	2.57-30	1.65-37	2.22-37	3.77-37	7.06-37	1.42-36	3.06-36	6.05-36	-4.04-35					
10	3.52-30	2.30-37	3.20-37	5.78-37	1.19-36	2.76-36	7.08-36	-2.28-36						
9	5.03-30	3.35-37	4.92-37	9.72-37	2.33-36	6.90-36	2.05-35							
8	7.57-30	5.21-37	8.28-37	1.90-36	6.00-36	2.99-35								
7	1.23-29	8.90-37	1.61-36	4.88-36	2.97-35									
6	2.22-29	1.76-36	4.09-36	2.47-35										
5	4.80-29	4.52-36	1.98-35											
4	1.47-28	2.19-35												
3	1.12-27													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	2.25-37	3.33-37	4.83-37	6.88-37	9.64-37	1.33-36	1.82-36	2.45-36	3.27-36	4.34-36	5.71-36	7.47-36	9.72-36	1.26-35
45	3.78-37	5.61-37	8.19-37	1.18-36	1.67-36	2.34-36	3.24-36	4.47-36	6.12-36	8.34-36	1.13-35	1.54-35	2.09-35	2.84-35
40	6.18-37	9.22-37	1.36-36	1.97-36	2.85-36	4.07-36	5.80-36	8.24-36	1.17-35	1.66-35	2.37-35	3.41-35	4.94-35	7.24-35
35	1.00-36	1.51-36	2.25-36	3.34-36	4.95-36	7.32-36	1.09-35	1.62-35	2.45-35	3.74-35	5.86-35	9.42-35	1.57-34	2.77-34
30	1.60-36	2.44-36	3.75-36	5.78-36	8.99-36	1.42-35	2.30-35	3.84-35	6.72-35	1.26-34	2.62-34	6.45-34	2.18-33	1.63-32
29	1.74-36	2.68-36	4.15-36	6.47-36	1.02-35	1.66-35	2.76-35	4.81-35	8.95-35	1.84-34	4.48-34	1.49-33	1.09-32	
28	1.80-36	2.93-36	4.59-36	7.27-36	1.17-35	1.95-35	3.38-35	6.24-35	1.27-34	3.02-34	9.80-34	6.93-33		
27	2.05-36	3.21-36	5.08-36	8.18-36	1.35-35	2.33-35	4.25-35	8.49-35	1.97-34	6.17-34	4.16-33			
26	2.22-36	3.50-36	5.62-36	9.25-36	1.58-35	2.83-35	5.53-35	1.24-34	3.68-34	2.27-33				
25	2.40-36	3.82-36	6.22-36	1.05-35	1.84-35	3.49-35	7.43-35	2.00-34	1.03-33					
24	2.59-36	4.14-36	6.81-36	1.16-35	2.10-35	4.09-35	9.08-35	2.44-34						
23	2.76-36	4.39-36	7.14-36	1.19-35	1.93-35	2.15-35	-2.42-34							
22	2.85-36	4.31-36	6.18-36	6.18-36	-1.92-35	-5.16-34								
21	2.64-36	2.91-36	-1.11-36	-4.06-35	-6.48-34									
20	1.27-36	-4.42-36	-4.88-35	-6.86-34										
19	-5.14-36	-4.83-35	-6.63-34											
18	-4.26-35	-6.02-34												
17	-5.19-34													

HE + TE = 1.00+05 NE = 1.00+06 CASE B NC = 70

TOTAL RC = 2.342-13 4-3 RC = 2.689-14 4-3 EM = 1.140-25 2S RC = 8.529-14 2P RC = 1.489-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.01-03	6.17-04	2.65-04	1.38-04	8.03-05	5.09-05	3.42-05	2.41-05	1.77-05	1.33-05	1.03-05	8.09-06	6.49-06	5.28-06
45	2.68-03	8.24-04	3.54-04	1.84-04	1.07-04	6.80-05	4.58-05	3.23-05	2.36-05	1.78-05	1.37-05	1.08-05	8.68-06	7.06-06
40	3.72-03	1.14-03	4.92-04	2.55-04	1.49-04	9.45-05	6.37-05	4.49-05	3.29-05	2.48-05	1.91-05	1.51-05	1.21-05	9.84-06
35	5.42-03	1.67-03	7.18-04	3.73-04	2.18-04	1.38-04	9.34-05	6.59-05	4.83-05	3.64-05	2.81-05	2.22-05	1.78-05	1.45-05
30	8.39-03	2.57-03	1.11-03	5.80-04	3.40-04	2.17-04	1.46-04	1.04-04	7.60-05	5.74-05	4.44-05	3.50-05	2.81-05	2.29-05
29	9.23-03	2.83-03	1.22-03	6.39-04	3.75-04	2.39-04	1.62-04	1.14-04	8.40-05	6.35-05	4.91-05	3.88-05	3.11-05	2.54-05
28	1.02-02	3.12-03	1.35-03	7.06-04	4.15-04	2.65-04	1.79-04	1.27-04	9.33-05	7.05-05	5.46-05	4.31-05	3.46-05	2.82-05
27	1.13-02	3.45-03	1.50-03	7.83-04	4.61-04	2.95-04	2.00-04	1.42-04	1.04-04	7.86-05	6.09-05	4.81-05	3.86-05	3.15-05
26	1.26-02	3.84-03	1.67-03	8.73-04	5.15-04	3.29-04	2.23-04	1.58-04	1.16-04	8.81-05	6.82-05	5.39-05	4.33-05	3.53-05
25	1.40-02	4.28-03	1.86-03	9.77-04	5.77-04	3.69-04	2.51-04	1.78-04	1.31-04	9.92-05	7.69-05	6.07-05	4.88-05	3.98-05
24	1.58-02	4.80-03	2.09-03	1.10-03	6.50-04	4.17-04	2.83-04	2.01-04	1.48-04	1.12-04	8.70-05	6.88-05	5.52-05	4.50-05
23	1.78-02	5.40-03	2.36-03	1.24-03	7.36-04	4.73-04	3.22-04	2.29-04	1.69-04	1.28-04	9.91-05	7.83-05	6.29-05	5.12-05
22	2.02-02	6.11-03	2.67-03	1.41-03	8.40-04	5.40-04	3.68-04	2.62-04	1.93-04	1.46-04	1.13-04	8.96-05	7.19-05	5.85-05
21	2.30-02	6.97-03	3.05-03	1.62-03	9.64-04	6.21-04	4.24-04	3.02-04	2.23-04	1.69-04	1.31-04	1.03-04	8.28-05	6.72-05
20	2.65-02	7.99-03	3.52-03	1.87-03	1.12-03	7.20-04	4.92-04	3.51-04	2.59-04	1.96-04	1.52-04	1.20-04	9.57-05	7.75-05
19	3.06-02	9.24-03	4.08-03	2.18-03	1.30-03	8.42-04	5.75-04	4.10-04	3.02-04	2.29-04	1.77-04	1.39-04	1.11-04	8.97-05
18	3.56-02	1.08-02	4.79-03	2.56-03	1.53-03	9.92-04	6.78-04	4.84-04	3.56-04	2.69-04	2.08-04	1.63-04	1.30-04	1.04-04
17	4.19-02	1.27-02	5.67-03	3.04-03	1.83-03	1.18-03	8.08-04	5.75-04	4.24-04	3.20-04	2.46-04	1.92-04	1.52-04	1.19-04
16	4.99-02	1.52-02	6.80-03	3.66-03	2.20-03	1.42-03	9.71-04	6.91-04	5.08-04	3.82-04	2.93-04	2.27-04	1.76-04	1.29-04
15	6.01-02	1.84-02	8.26-03	4.44-03	2.67-03	1.73-03	1.18-03	8.38-04	6.14-04	4.61-04	3.50-04	2.66-04	1.93-04	
14	7.35-02	2.26-02	1.02-02	5.48-03	3.29-03	2.13-03	1.45-03	1.03-03	7.50-04	5.58-04	4.16-04	2.97-04		
13	9.16-02	2.83-02	1.27-02	6.85-03	4.11-03	2.66-03	1.81-03	1.28-03	9.24-04	6.74-04	4.72-04			
12	1.16-01	3.60-02	1.62-02	8.72-03	5.23-03	3.37-03	2.29-03	1.60-03	1.14-03	7.79-04				
11	1.51-01	4.68-02	2.11-02	1.13-02	6.79-03	4.36-03	2.93-03	2.02-03	1.35-03					
10	2.02-01	6.24-02	2.81-02	1.51-02	9.02-03	5.75-03	3.80-03	2.45-03						
9	2.79-01	8.60-02	3.86-02	2.07-02	1.23-02	7.70-03	4.78-03							
8	4.02-01	1.23-01	5.51-02	2.94-02	1.72-02	1.01-02								
7	6.09-01	1.85-01	8.24-02	4.33-02	2.38-02									
6	9.91-01	2.98-01	1.30-01	6.44-02										
5	1.78+00	5.21-01	2.14-01											
4	3.73+00	1.00+00												
3	1.01+01													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.36-06	3.63-06	3.06-06	2.61-06	2.24-06	1.93-06	1.68-06	1.47-06	1.30-06	1.15-06	1.02-06	9.10-07	8.15-07	7.34-07
45	5.83-06	4.86-06	4.10-06	3.49-06	2.99-06	2.58-06	2.25-06	1.97-06	1.73-06	1.53-06	1.36-06	1.21-06	1.09-06	9.79-07
40	8.11-06	6.77-06	5.71-06	4.86-06	4.16-06	3.60-06	3.13-06	2.74-06	2.41-06	2.13-06	1.89-06	1.69-06	1.51-06	1.36-06
35	1.19-05	9.97-06	8.40-06	7.15-06	6.13-06	5.29-06	4.60-06	4.02-06	3.53-06	3.12-06	2.77-06	2.46-06	2.20-06	1.96-06
30	1.89-05	1.58-05	1.33-05	1.13-05	9.68-06	8.35-06	7.24-06	6.31-06	5.53-06	4.85-06	4.26-06	3.73-06	3.22-06	2.63-06
29	2.09-05	1.75-05	1.47-05	1.25-05	1.07-05	9.23-06	8.00-06	6.96-06	6.08-06	5.32-06	4.63-06	3.99-06	3.24-06	
28	2.33-05	1.94-05	1.64-05	1.39-05	1.19-05	1.02-05	8.86-06	7.69-06	6.69-06	5.81-06	4.97-06	4.03-06		
27	2.60-05	2.17-05	1.82-05	1.55-05	1.32-05	1.14-05	9.83-06	8.50-06	7.34-06	6.26-06	5.04-06			
26	2.91-05	2.43-05	2.04-05	1.73-05	1.48-05	1.27-05	1.09-05	9.17-06	7.95-06	6.37-06				
25	3.28-05	2.73-05	2.30-05	1.95-05	1.66-05	1.42-05	1.21-05	1.02-05	8.13-06					
24	3.71-05	3.09-05	2.59-05	2.19-05	1.86-05	1.58-05	1.32-05	1.05-05						
23	4.21-05	3.50-05	2.93-05	2.47-05	2.08-05	1.73-05	1.36-05							
22	4.81-05	3.99-05	3.33-05	2.78-05	2.30-05	1.80-05								
21	5.51-05	4.55-05	3.76-05	3.09-05	2.40-05									
20	6.33-05	5.18-05	4.21-05	3.24-05										
19	7.26-05	5.84-05	4.46-05											
18	8.25-05	6.23-05												
17	8.88-05													

HE + TE = 1.00+05 NE = 1.00+06 CASE B NC = 70

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	5.55-33	1.54-39	1.60-39	1.59-39	1.16-39	4.81-41	-1.95-39	-5.02-39	-9.37-39	-1.53-38	-2.31-38	-3.36-38	-4.81-38	-6.87-38
45	7.62-33	2.14-39	2.32-39	2.55-39	2.48-39	2.00-39	1.15-39	1.28-40	-6.52-40	-6.11-40	9.65-40	4.80-39	1.14-38	2.09-38
40	1.09-32	3.10-39	3.47-39	4.12-39	4.75-39	5.48-39	6.83-39	9.79-39	1.59-38	2.76-38	4.79-38	8.10-38	1.32-37	2.07-37
35	1.63-32	4.69-39	5.41-39	6.83-39	8.71-39	1.16-38	1.69-38	2.69-38	4.55-38	7.82-38	1.33-37	2.23-37	3.62-37	5.74-37
30	2.60-32	7.55-39	9.00-39	1.20-38	1.66-38	2.42-38	3.76-38	6.20-38	1.06-37	1.81-37	3.09-37	5.19-37	8.57-37	1.39-36
29	2.88-32	8.39-39	1.01-38	1.36-38	1.91-38	2.82-38	4.43-38	7.34-38	1.25-37	2.15-37	3.66-37	6.16-37	1.02-36	1.67-36
28	3.20-32	9.34-39	1.13-38	1.55-38	2.20-38	3.30-38	5.24-38	8.70-38	1.48-37	2.55-37	4.35-37	7.33-37	1.22-36	2.02-36
27	3.58-32	1.04-38	1.27-38	1.76-38	2.55-38	3.88-38	6.20-38	1.03-37	1.76-37	3.02-37	5.17-37	8.75-37	1.47-36	2.45-36
26	4.01-32	1.17-38	1.44-38	2.02-38	2.96-38	4.56-38	7.35-38	1.23-37	2.10-37	3.60-37	6.16-37	1.05-36	1.77-36	2.99-36
25	4.52-32	1.32-38	1.63-38	2.32-38	3.45-38	5.38-38	8.73-38	1.46-37	2.50-37	4.29-37	7.36-37	1.26-36	2.15-36	3.67-36
24	5.12-32	1.49-38	1.85-38	2.67-38	4.04-38	6.35-38	1.04-37	1.74-37	2.98-37	5.11-37	8.81-37	1.52-36	2.62-36	4.55-36
23	5.83-32	1.70-38	2.12-38	3.09-38	4.73-38	7.51-38	1.23-37	2.07-37	3.54-37	6.10-37	1.06-36	1.83-36	3.21-36	5.69-36
22	6.68-32	1.93-38	2.43-38	3.58-38	5.54-38	8.89-38	1.46-37	2.47-37	4.21-37	7.27-37	1.27-36	2.22-36	3.96-36	7.21-36
21	7.71-32	2.22-38	2.80-38	4.16-38	6.51-38	1.05-37	1.74-37	2.93-37	5.00-37	8.66-37	1.52-36	2.71-36	4.93-36	9.29-36
20	8.96-32	2.56-38	3.24-38	4.86-38	7.66-38	1.24-37	2.06-37	3.46-37	5.93-37	1.03-36	1.83-36	3.31-36	6.22-36	1.23-35
19	1.05-31	2.98-38	3.77-38	5.70-38	9.05-38	1.47-37	2.44-37	4.10-37	7.03-37	1.23-36	2.21-36	4.10-36	7.99-36	1.68-35
18	1.24-31	3.49-38	4.43-38	6.73-38	1.07-37	1.75-37	2.89-37	4.87-37	8.37-37	1.48-36	2.69-36	5.14-36	1.05-35	2.40-35
17	1.48-31	4.14-38	5.26-38	8.02-38	1.28-37	2.10-37	3.48-37	5.86-37	1.01-36	1.80-36	3.35-36	6.60-36	1.42-35	3.46-35
16	1.79-31	4.98-38	6.32-38	9.69-38	1.56-37	2.56-37	4.26-37	7.23-37	1.26-36	2.26-36	4.26-36	8.43-36	1.64-35	-2.69-35
15	2.19-31	6.06-38	7.73-38	1.19-37	1.93-37	3.20-37	5.39-37	9.25-37	1.63-36	2.94-36	5.35-36	7.27-36	-7.60-35	
14	2.72-31	7.52-38	9.64-38	1.50-37	2.47-37	4.17-37	7.17-37	1.26-36	2.24-36	3.90-36	3.84-36	-8.58-35		
13	3.44-31	9.54-38	1.23-37	1.96-37	3.30-37	5.74-37	1.02-36	1.86-36	3.31-36	3.52-36	-7.32-35			
12	4.45-31	1.24-37	1.63-37	2.65-37	4.63-37	8.47-37	1.60-36	3.08-36	4.54-36	-4.96-35				
11	5.90-31	1.66-37	2.23-37	3.77-37	6.98-37	1.38-36	2.88-36	5.70-36	-2.34-35					
10	8.08-31	2.30-37	3.20-37	5.74-37	1.16-36	2.61-36	6.36-36	-4.23-38						
9	1.15-30	3.36-37	4.91-37	9.60-37	2.24-36	6.31-36	1.68-35							
8	1.73-30	5.22-37	8.25-37	1.86-36	5.66-36	2.56-35								
7	2.80-30	8.90-37	1.60-36	4.75-36	2.69-35									
6	5.05-30	1.76-36	4.06-36	2.36-35										
5	1.09-29	4.52-36	1.95-35											
4	3.28-29	2.19-35												
3	2.44-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-9.89-38	-1.44-37	-2.11-37	-3.13-37	-4.64-37	-6.89-37	-1.02-36	-1.50-36	-2.20-36	-3.21-36	-4.66-36	-6.72-36	-9.65-36	-1.38-35
45	3.24-38	4.39-38	5.11-38	4.58-38	1.53-38	-6.10-38	-2.17-37	-5.05-37	-1.00-36	-1.84-36	-3.20-36	-5.39-36	-8.83-36	-1.42-35
40	3.13-37	4.60-37	6.56-37	9.13-37	1.24-36	1.65-36	2.14-36	2.70-36	3.30-36	3.85-36	4.18-36	3.94-36	2.45-36	-1.55-36
35	8.88-37	1.35-36	2.01-36	2.97-36	4.34-36	6.31-36	9.14-36	1.32-35	1.92-35	2.79-35	4.10-35	6.08-35	9.19-35	1.42-34
30	2.24-36	3.56-36	5.65-36	8.97-36	1.44-35	2.33-35	3.87-35	6.63-35	1.19-34	2.28-34	4.85-34	1.22-33	4.19-33	3.11-32
29	2.71-36	4.37-36	7.06-36	1.14-35	1.88-35	3.16-35	5.49-35	9.97-35	1.94-34	4.19-34	1.07-33	3.75-33	2.85-32	
28	3.31-36	5.42-36	8.91-36	1.48-35	2.52-35	4.42-35	8.11-35	1.59-34	3.48-34	9.01-34	3.20-33	2.47-32		
27	4.06-36	6.77-36	1.14-35	1.96-35	3.46-35	6.41-35	1.27-34	2.80-34	7.30-34	2.62-33	2.04-32			
26	5.04-36	8.58-36	1.49-35	2.65-35	4.94-35	9.85-35	2.18-34	5.70-34	2.05-33	1.61-32				
25	6.31-36	1.10-35	1.98-35	3.71-35	7.42-35	1.64-34	4.31-34	1.55-33	1.21-32					
24	8.01-36	1.45-35	2.72-35	5.44-35	1.20-34	3.15-34	1.12-33	8.66-33						
23	1.03-35	1.95-35	3.90-35	8.58-35	2.22-34	7.84-34	5.92-33							
22	1.36-35	2.71-35	5.94-35	1.52-34	5.24-34	3.82-33								
21	1.85-35	4.00-35	1.00-34	3.36-34	2.33-33									
20	2.62-35	6.44-35	2.07-34	1.33-33										
19	3.99-35	1.21-34	6.92-34											
18	6.69-35	3.04-34												
17	8.61-35													

HE + TE = 1.00+05 NE = 1.00+07 CASE B NC = 64

TOTAL RC = 2.344-13 4-3 RC = 2.674-14 4-3 EM = 1.133-25 2S RC = 8.531-14 2P RC = 1.491-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.16-03	6.62-04	2.85-04	1.47-04	8.60-05	5.45-05	3.67-05	2.58-05	1.89-05	1.42-05	1.10-05	8.65-06	6.94-06	5.65-06
45	2.91-03	8.93-04	3.84-04	1.99-04	1.16-04	7.35-05	4.95-05	3.49-05	2.55-05	1.92-05	1.48-05	1.17-05	9.35-06	7.61-06
40	4.04-03	1.24-03	5.32-04	2.76-04	1.61-04	1.02-04	6.86-05	4.83-05	3.53-05	2.66-05	2.05-05	1.62-05	1.30-05	1.05-05
35	5.81-03	1.78-03	7.67-04	3.97-04	2.32-04	1.47-04	9.88-05	6.96-05	5.09-05	3.83-05	2.96-05	2.33-05	1.87-05	1.52-05
30	8.87-03	2.72-03	1.17-03	6.07-04	3.54-04	2.25-04	1.51-04	1.07-04	7.79-05	5.87-05	4.53-05	3.56-05	2.86-05	2.32-05
29	9.75-03	2.99-03	1.29-03	6.67-04	3.90-04	2.47-04	1.66-04	1.17-04	8.57-05	6.45-05	4.98-05	3.92-05	3.14-05	2.[illegible]-05
28	1.08-02	3.30-03	1.42-03	7.37-04	4.30-04	2.73-04	1.84-04	1.30-04	9.47-05	7.13-05	5.50-05	4.33-05	3.47-05	2.82-05
27	1.19-02	3.66-03	1.57-03	8.17-04	4.77-04	3.03-04	2.04-04	1.44-04	1.05-04	7.91-05	6.10-05	4.81-05	3.85-05	3.13-05
26	1.33-02	4.07-03	1.75-03	9.09-04	5.31-04	3.37-04	2.27-04	1.60-04	1.17-04	8.82-05	6.81-05	5.36-05	4.29-05	3.49-05
25	1.48-02	4.55-03	1.96-03	1.02-03	5.95-04	3.77-04	2.54-04	1.79-04	1.31-04	9.88-05	7.63-05	6.00-05	4.81-05	3.91-05
24	1.66-02	5.11-03	2.20-03	1.14-03	6.69-04	4.25-04	2.86-04	2.02-04	1.48-04	1.11-04	8.59-05	6.76-05	5.41-05	4.40-05
23	1.88-02	5.76-03	2.48-03	1.29-03	7.56-04	4.80-04	3.24-04	2.29-04	1.67-04	1.26-04	9.73-05	7.66-05	6.13-05	4.98-05
22	2.13-02	6.53-03	2.82-03	1.47-03	8.59-04	5.46-04	3.69-04	2.60-04	1.91-04	1.44-04	1.11-04	8.73-05	6.98-05	5.67-05
21	2.43-02	7.44-03	3.22-03	1.68-03	9.83-04	6.26-04	4.22-04	2.99-04	2.19-04	1.65-04	1.27-04	1.00-04	8.01-05	6.49-05
20	2.79-02	8.54-03	3.69-03	1.93-03	1.13-03	7.21-04	4.88-04	3.45-04	2.53-04	1.91-04	1.47-04	1.16-04	9.24-05	7.47-05
19	3.23-02	9.86-03	4.27-03	2.23-03	1.31-03	8.38-04	5.67-04	4.01-04	2.94-04	2.22-04	1.71-04	1.35-04	1.07-04	8.64-05
18	3.77-02	1.15-02	4.98-03	2.61-03	1.54-03	9.83-04	6.66-04	4.72-04	3.46-04	2.61-04	2.01-04	1.58-04	1.25-04	1.00-04
17	4.44-02	1.35-02	5.85-03	3.08-03	1.82-03	1.16-03	7.90-04	5.60-04	4.10-04	3.09-04	2.38-04	1.86-04	1.47-04	1.15-04
16	5.29-02	1.60-02	6.96-03	3.67-03	2.17-03	1.39-03	9.47-04	6.72-04	4.92-04	3.70-04	2.84-04	2.20-04	1.71-04	1.26-04
15	6.37-02	1.92-02	8.38-03	4.44-03	2.64-03	1.69-03	1.15-03	8.16-04	5.97-04	4.47-04	3.40-04	2.59-04	1.89-04	
14	7.76-02	2.33-02	1.02-02	5.45-03	3.24-03	2.09-03	1.42-03	1.00-03	7.31-04	5.44-04	4.06-04	2.91-04		
13	9.59-02	2.89-02	1.28-02	6.80-03	4.06-03	2.61-03	1.77-03	1.25-03	9.04-04	6.60-04	4.63-04			
12	1.21-01	3.65-02	1.62-02	8.67-03	5.18-03	3.33-03	2.25-03	1.57-03	1.12-03	7.65-04				
11	1.55-01	4.72-02	2.11-02	1.13-02	6.73-03	4.31-03	2.89-03	1.98-03	1.32-03					
10	2.06-01	6.29-02	2.81-02	1.50-02	8.95-03	5.69-03	3.75-03	2.41-03						
9	2.83-01	8.65-02	3.87-02	2.07-02	1.22-02	7.62-03	4.71-03							
8	4.06-01	1.24-01	5.52-02	2.93-02	1.70-02	9.97-03								
7	6.14-01	1.86-01	8.25-02	4.31-02	2.35-02									
6	9.98-01	2.99-01	1.30-01	6.39-02										
5	1.79+00	5.23-01	2.13-01											
4	3.76+00	1.00+00												
3	1.02+01													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.66-06	3.88-06	3.27-06	2.79-06	2.39-06	2.06-06	1.80-06	1.57-06	1.38-06	1.22-06	1.09-06	9.71-07	8.70-07	7.83-07
45	6.27-06	5.23-06	4.41-06	3.75-06	3.22-06	2.78-06	2.42-06	2.12-06	1.86-06	1.65-06	1.46-06	1.31-06	1.17-06	1.05-06
40	8.70-06	7.25-06	6.11-06	5.20-06	4.46-06	3.85-06	3.35-06	2.93-06	2.57-06	2.27-06	2.02-06	1.80-06	1.61-06	1.45-06
35	1.25-05	1.04-05	8.79-06	7.47-06	6.40-06	5.53-06	4.80-06	4.20-06	3.69-06	3.25-06	2.88-06	2.57-06	2.29-06	2.05-06
30	1.91-05	1.59-05	1.34-05	1.14-05	9.75-06	8.40-06	7.28-06	6.34-06	5.55-06	4.87-06	4.27-06	3.74-06	3.23-06	2.64-06
29	2.10-05	1.75-05	1.48-05	1.25-05	1.07-05	9.22-06	7.98-06	6.94-06	6.06-06	5.30-06	4.61-06	3.97-06	3.23-06	
28	2.32-05	1.94-05	1.63-05	1.38-05	1.18-05	1.02-05	8.78-06	7.62-06	6.62-06	5.74-06	4.92-06	3.98-06		
27	2.58-05	2.15-05	1.80-05	1.53-05	1.31-05	1.12-05	9.68-06	8.36-06	7.22-06	6.15-06	4.96-06			
26	2.87-05	2.39-05	2.01-05	1.70-05	1.45-05	1.24-05	1.07-05	9.16-06	7.77-06	6.23-06				
25	3.21-05	2.67-05	2.24-05	1.90-05	1.62-05	1.38-05	1.18-05	9.92-06	7.92-06					
24	3.62-05	3.01-05	2.52-05	2.13-05	1.80-05	1.53-05	1.28-05	1.02-05						
23	4.09-05	3.40-05	2.84-05	2.39-05	2.01-05	1.67-05	1.32-05							
22	4.65-05	3.85-05	3.21-05	2.68-05	2.22-05	1.74-05								
21	5.31-05	4.39-05	3.63-05	2.98-05	2.32-05									
20	6.10-05	5.00-05	4.06-05	3.14-05										
19	7.01-05	5.64-05	4.32-05											
18	7.98-05	6.05-05												
17	8.64-05													

HE + TE = 1.00+05 NE = 1.00+07 CASE B NC = 64

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.54-33	1.49-39	1.39-39	9.20-40	-5.97-40	-3.94-39	-1.02-38	-2.08-38	-3.81-38	-6.53-38	-1.07-37	-1.70-37	-2.63-37	-3.96-37
45	4.86-33	2.07-39	1.99-39	1.50-39	-2.39-40	-4.17-39	-1.16-38	-2.44-38	-4.54-38	-7.88-38	-1.31-37	-2.11-37	-3.30-37	-5.06-37
40	6.93-33	3.00-39	3.01-39	2.66-39	9.46-40	-3.18-39	-1.11-38	-2.50-38	-4.81-38	-8.56-38	-1.45-37	-2.39-37	-3.84-37	-6.03-37
35	1.04-32	4.57-39	4.86-39	5.06-39	4.07-39	1.03-39	-5.16-39	-1.62-38	-3.49-38	-6.65-38	-1.19-37	-2.07-37	-3.49-37	-5.79-37
30	1.66-32	7.44-39	8.37-39	9.92-39	1.11-38	1.19-38	1.24-38	1.31-38	1.42-38	1.44-38	1.05-38	-5.31-39	-4.66-38	-1.39-37
29	1.83-32	8.28-39	9.41-39	1.14-38	1.33-38	1.53-38	1.80-38	2.28-38	3.09-38	4.29-38	5.80-38	7.21-38	7.68-38	5.39-38
28	2.04-32	9.25-39	1.06-38	1.31-38	1.58-38	1.93-38	2.47-38	3.43-38	5.09-38	7.74-38	1.17-37	1.69-37	2.35-37	3.08-37
27	2.28-32	1.04-38	1.20-38	1.51-38	1.88-38	2.40-38	3.26-38	4.81-38	7.52-38	1.20-37	1.89-37	2.92-37	4.41-37	6.48-37
26	2.56-32	1.17-38	1.36-38	1.74-38	2.23-38	2.96-38	4.22-38	6.49-38	1.05-37	1.72-37	2.81-37	4.51-37	7.13-37	1.11-36
25	2.88-32	1.32-38	1.56-38	2.02-38	2.66-38	3.66-38	5.40-38	8.77-38	1.46-37	2.39-37	4.00-37	6.62-37	1.08-36	1.77-36
24	3.26-32	1.50-38	1.78-38	2.36-38	3.19-38	4.51-38	6.88-38	1.12-37	1.90-37	3.26-37	5.59-37	9.48-37	1.60-36	2.73-36
23	3.72-32	1.71-38	2.06-38	2.77-38	3.83-38	5.60-38	8.77-38	1.46-37	2.53-37	4.42-37	7.74-37	1.35-36	2.36-36	4.18-36
22	4.26-32	1.97-38	2.39-38	3.27-38	4.65-38	6.98-38	1.12-37	1.91-37	3.37-37	6.00-37	1.07-36	1.93-36	3.49-36	6.49-36
21	4.91-32	2.28-38	2.80-38	3.90-38	5.68-38	8.77-38	1.44-37	2.51-37	4.50-37	8.19-37	1.50-36	2.78-36	5.27-36	1.04-35
20	5.71-32	2.66-38	3.30-38	4.69-38	7.01-38	1.11-37	1.87-37	3.32-37	6.07-37	1.13-36	2.13-36	4.10-36	8.20-36	1.74-35
19	6.68-32	3.12-38	3.91-38	5.68-38	8.71-38	1.42-37	2.44-37	4.42-37	8.26-37	1.58-36	3.08-36	6.23-36	1.34-35	3.15-35
18	7.90-32	3.69-33	4.68-38	6.94-38	1.09-37	1.82-37	3.22-37	5.95-37	1.14-36	2.24-36	4.58-36	9.86-36	2.33-35	6.48-35
17	9.43-32	4.40-38	5.65-38	8.56-38	1.38-37	2.37-37	4.28-37	8.10-37	1.59-36	3.26-36	7.06-36	1.66-35	4.58-35	1.70-34
16	1.14-31	5.29-38	6.88-38	1.06-37	1.76-37	3.10-37	5.73-37	1.11-36	2.27-36	4.90-36	1.15-35	3.11-35	1.12-34	8.17-34
15	1.39-31	6.44-38	8.46-38	1.34-37	2.27-37	4.08-37	7.75-37	1.55-36	3.31-36	7.67-36	2.03-35	6.99-35	4.66-34	
14	1.73-31	7.96-38	1.05-37	1.70-37	2.96-37	5.45-37	1.06-36	2.22-36	5.03-36	1.29-35	4.22-35	2.44-34		
13	2.19-31	1.00-37	1.34-37	2.20-37	3.92-37	7.41-37	1.50-36	3.30-36	8.18-36	2.49-35	1.19-34			
12	2.83-31	1.29-37	1.74-37	2.92-37	5.35-37	1.05-36	2.23-36	5.31-36	1.51-35	5.42-35				
11	3.75-31	1.70-37	2.34-37	4.05-37	7.72-37	1.60-36	3.71-36	9.97-36	2.70-35					
10	5.13-31	2.34-37	3.30-37	5.98-37	1.22-36	2.81-36	7.52-36	1.92-35						
9	7.31-31	3.39-37	4.99-37	9.74-37	2.25-36	6.31-36	2.05-35							
8	1.10-30	5.25-37	8.29-37	1.85-36	5.45-36	2.37-35								
7	1.77-30	8.92-37	1.60-36	4.62-36	2.45-35									
6	3.19-30	1.76-36	4.02-36	2.22-35										
5	6.82-30	4.52-36	1.91-35											
4	2.04-29	2.18-35												
3	1.49-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-5.86-37	-8.52-37	-1.22-36	-1.73-36	-2.42-36	-3.36-36	-4.62-36	-6.30-36	-8.53-36	-1.15-35	-1.54-35	-2.04-35	-2.70-35	-3.55-35
45	-7.61-37	-1.13-36	-1.65-36	-2.38-36	-3.41-36	-4.84-36	-6.84-36	-9.60-36	-1.34-35	-1.86-35	-2.58-35	-3.57-35	-4.92-35	-6.78-35
40	-9.33-37	-1.42-36	-2.14-36	-3.21-36	-4.76-36	-7.04-36	-1.04-35	-1.53-35	-2.24-35	-3.30-35	-4.86-35	-7.19-35	-1.07-34	-1.60-34
35	-9.45-37	-1.52-36	-2.44-36	-3.89-36	-6.20-36	-9.87-36	-1.58-35	-2.53-35	-4.11-35	-6.74-35	-1.13-34	-1.93-34	-3.42-34	-6.34-34
30	-3.30-37	-7.08-37	-1.45-36	-2.88-36	-5.67-36	-1.11-35	-2.21-35	-4.48-35	-9.46-35	-2.13-34	-5.29-34	-1.56-33	-6.32-33	-5.62-32
29	-3.43-38	-2.66-37	-8.05-37	-2.00-36	-4.59-36	-1.02-35	-2.24-35	-5.05-35	-1.20-34	-3.13-34	-9.62-34	-4.05-33	-3.74-32	
28	3.69-37	3.64-37	1.60-37	-5.71-37	-2.59-36	-7.75-36	-2.09-35	-5.61-35	-1.60-34	-5.27-34	-2.35-33	-2.29-32		
27	9.27-37	1.28-36	1.64-36	1.80-36	1.11-36	-2.35-36	-1.47-35	-5.76-35	-2.28-34	-1.15-33	-1.23-32			
26	1.72-36	2.64-36	3.99-36	5.88-36	8.25-36	1.01-35	6.02-36	-3.48-35	-3.46-34	-4.93-33				
25	2.89-36	4.76-36	7.91-36	1.34-35	2.31-35	4.17-35	7.88-35	1.49-34	-2.09-34					
24	4.69-36	8.22-36	1.49-35	2.83-35	5.81-35	1.37-34	4.20-34	2.54-33						
23	7.58-36	1.43-35	2.84-35	6.19-35	1.57-34	5.37-34	3.87-33							
22	1.25-35	2.58-35	5.81-35	1.54-34	5.52-34	4.25-33								
21	2.17-35	5.02-35	1.36-34	5.05-34	4.02-33									
20	4.08-35	1.13-34	4.24-34	3.44-33										
19	8.76-35	3.32-34	2.70-33											
18	2.44-34	1.96-33												
17	1.32-33													

HE + TE = 1.00+05 NE = 1.00+08 CASE B NC = 40

TOTAL RC = 2.349-13 4-3 RC = 2.652-14 4-3 EM = 1.124-25 2S RC = 8.535-14 2P RC = 1.495-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.23-03	6.85-04	2.94-04	1.52-04	8.89-05	5.63-05	3.79-05	2.67-05	1.95-05	1.47-05	1.13-05	8.94-06	7.17-06	5.83-06
45	3.05-03	9.35-04	4.02-04	2.08-04	1.21-04	7.69-05	5.17-05	3.65-05	2.67-05	2.01-05	1.55-05	1.22-05	9.78-06	7.96-06
40	4.30-03	1.32-03	5.67-04	2.94-04	1.71-04	1.08-04	7.30-05	5.14-05	3.76-05	2.83-05	2.18-05	1.72-05	1.38-05	1.12-05
35	6.31-03	1.94-03	8.32-04	4.31-04	2.51-04	1.59-04	1.07-04	7.54-05	5.51-05	4.15-05	3.20-05	2.52-05	2.02-05	1.64-05
30	9.70-03	2.98-03	1.28-03	6.62-04	3.86-04	2.45-04	1.64-04	1.16-04	8.47-05	6.37-05	4.91-05	3.87-05	3.10-05	2.52-05
29	1.06-02	3.27-03	1.40-03	7.27-04	4.24-04	2.68-04	1.80-04	1.27-04	9.29-05	6.99-05	5.39-05	4.24-05	3.39-05	2.76-05
28	1.17-02	3.59-03	1.54-03	7.99-04	4.66-04	2.95-04	1.99-04	1.40-04	1.02-04	7.69-05	5.92-05	4.66-05	3.73-05	3.03-05
27	1.29-02	3.96-03	1.70-03	8.82-04	5.14-04	3.26-04	2.19-04	1.54-04	1.13-04	8.48-05	6.54-05	5.14-05	4.12-05	3.34-05
26	1.43-02	4.39-03	1.89-03	9.77-04	5.70-04	3.61-04	2.43-04	1.71-04	1.25-04	9.39-05	7.23-05	5.69-05	4.55-05	3.70-05
25	1.59-02	4.88-03	2.10-03	1.09-03	6.33-04	4.01-04	2.70-04	1.90-04	1.39-04	1.04-04	8.04-05	6.32-05	5.06-05	4.11-05
24	1.78-02	5.45-03	2.34-03	1.21-03	7.08-04	4.48-04	3.01-04	2.12-04	1.55-04	1.16-04	8.97-05	7.06-05	5.64-05	4.58-05
23	2.00-02	6.12-03	2.63-03	1.36-03	7.95-04	5.03-04	3.38-04	2.38-04	1.74-04	1.31-04	1.01-04	7.92-05	6.33-05	5.13-05
22	2.26-02	6.92-03	2.97-03	1.54-03	8.99-04	5.69-04	3.83-04	2.69-04	1.97-04	1.48-04	1.14-04	8.94-05	7.14-05	5.78-05
21	2.57-02	7.87-03	3.38-03	1.75-03	1.02-03	6.48-04	4.35-04	3.07-04	2.24-04	1.68-04	1.29-04	1.02-04	8.10-05	6.56-05
20	2.94-02	9.03-03	3.88-03	2.01-03	1.17-03	7.43-04	4.99-04	3.52-04	2.57-04	1.93-04	1.48-04	1.16-04	9.26-05	7.48-05
19	3.40-02	1.04-02	4.49-03	2.33-03	1.36-03	8.59-04	5.78-04	4.07-04	2.97-04	2.23-04	1.71-04	1.34-04	1.07-04	8.57-05
18	3.97-02	1.22-02	5.23-03	2.71-03	1.58-03	1.00-03	6.74-04	4.75-04	3.46-04	2.60-04	1.99-04	1.56-04	1.23-04	9.86-05
17	4.67-02	1.43-02	6.15-03	3.19-03	1.86-03	1.18-03	7.95-04	5.59-04	4.08-04	3.06-04	2.34-04	1.82-04	1.43-04	1.13-04
16	5.55-02	1.70-02	7.31-03	3.80-03	2.22-03	1.41-03	9.47-04	6.66-04	4.85-04	3.63-04	2.77-04	2.14-04	1.66-04	1.23-04
15	6.68-02	2.04-02	8.78-03	4.57-03	2.67-03	1.70-03	1.14-03	8.03-04	5.84-04	4.36-04	3.30-04	2.51-04	1.83-04	
14	8.15-02	2.48-02	1.07-02	5.57-03	3.26-03	2.07-03	1.39-03	9.80-04	7.11-04	5.27-04	3.93-04	2.82-04		
13	1.01-01	3.06-02	1.32-02	6.89-03	4.05-03	2.57-03	1.73-03	1.21-03	8.75-04	6.38-04	4.49-04			
12	1.28-01	3.84-02	1.66-02	8.69-03	5.11-03	3.25-03	2.19-03	1.52-03	1.08-03	7.43-04				
11	1.64-01	4.91-02	2.13-02	1.12-02	6.61-03	4.20-03	2.81-03	1.93-03	1.29-03					
10	2.17-01	6.46-02	2.82-02	1.49-02	8.78-03	5.55-03	3.65-03	2.35-03						
9	2.95-01	8.80-02	3.86-02	2.04-02	1.20-02	7.46-03	4.60-03							
8	4.18-01	1.25-01	5.51-02	2.90-02	1.68-02	9.78-03								
7	6.25-01	1.88-01	8.24-02	4.27-02	2.31-02									
6	1.01+00	3.01-01	1.30-01	6.32-02										
5	1.81+00	5.25-01	2.12-01											
4	3.79+00	1.00+00												
3	1.03+01													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.81-06	4.01-06	3.38-06	2.88-06	2.47-06	2.13-06	1.85-06	1.62-06	1.43-06	1.26-06	1.12-06	1.00-06	8.98-07	8.08-07
45	6.56-06	5.47-06	4.61-06	3.92-06	3.36-06	2.91-06	2.53-06	2.21-06	1.95-06	1.72-06	1.53-06	1.36-06	1.22-06	1.10-06
40	9.24-06	7.71-06	6.49-06	5.52-06	4.73-06	4.09-06	3.55-06	3.11-06	2.73-06	2.42-06	2.14-06	1.91-06	1.71-06	1.54-06
35	1.35-05	1.13-05	9.50-06	8.07-06	6.92-06	5.97-06	5.18-06	4.53-06	3.98-06	3.51-06	3.11-06	2.77-06	2.47-06	2.21-06
30	2.07-05	1.73-05	1.45-05	1.23-05	1.05-05	9.09-06	7.87-06	6.86-06	6.00-06	5.26-06	4.61-06	4.04-06	3.49-06	2.84-06
29	2.27-05	1.89-05	1.59-05	1.35-05	1.15-05	9.94-06	8.60-06	7.48-06	6.52-06	5.70-06	4.97-06	4.27-06	3.47-06	
28	2.50-05	2.08-05	1.75-05	1.48-05	1.27-05	1.09-05	9.41-06	8.16-06	7.09-06	6.15-06	5.27-06	4.26-06		
27	2.75-05	2.29-05	1.92-05	1.63-05	1.39-05	1.19-05	1.03-05	8.90-06	7.68-06	6.64-06	5.27-06			
26	3.04-05	2.53-05	2.12-05	1.80-05	1.53-05	1.31-05	1.13-05	9.67-06	8.20-06	6.58-06				
25	3.38-05	2.81-05	2.35-05	1.99-05	1.69-05	1.44-05	1.23-05	1.04-05	8.28-06					
24	3.76-05	3.12-05	2.62-05	2.21-05	1.87-05	1.58-05	1.33-05	1.05-05						
23	4.21-05	3.49-05	2.92-05	2.45-05	2.06-05	1.71-05	1.35-05							
22	4.74-05	3.92-05	3.26-05	2.72-05	2.25-05	1.76-05								
21	5.36-05	4.42-05	3.65-05	2.99-05	2.33-05									
20	6.09-05	4.98-05	4.05-05	3.12-05										
19	6.93-05	5.58-05	4.26-05											
18	7.84-05	5.93-05												
17	8.43-05													

HE + TE = 1.00+05 NE = 1.00+08 CASE B NC = 40

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	3.28-33	4.47-39	1.29-39	5.76-40	-1.58-39	-6.41-39	-1.58-38	-3.24-38	-5.98-38	-1.03-37	-1.66-37	-2.59-37	-3.92-37	-5.77-37
45	4.50-33	2.03-39	1.80-39	8.51-40	-2.05-39	-8.64-39	-2.15-38	-4.45-38	-8.29-38	-1.43-37	-2.35-37	-3.70-37	-5.66-37	-8.43-37
40	6.42-33	2.92-39	2.63-39	1.40-39	-2.53-39	-1.16-38	-2.96-38	-6.22-38	-1.17-37	-2.06-37	-3.42-37	-5.47-37	-8.50-37	-1.29-36
35	9.61-33	4.41-39	4.12-39	2.61-39	-2.59-39	-1.50-38	-4.02-38	-8.69-38	-1.68-37	-3.01-37	-5.11-37	-8.37-37	-1.34-36	-2.09-36
30	1.53-32	7.17-39	7.12-39	5.75-39	-3.23-40	-1.60-38	-4.94-38	-1.14-37	-2.30-37	-4.28-37	-7.55-37	-1.29-36	-2.15-36	-3.54-36
29	1.70-32	7.99-39	8.06-39	6.87-39	8.46-40	-1.51-38	-4.98-38	-1.17-37	-2.41-37	-4.53-37	-8.09-37	-1.40-36	-2.36-36	-3.94-36
28	1.89-32	8.94-39	9.17-39	8.24-39	2.42-39	-1.37-38	-4.92-38	-1.20-37	-2.50-37	-4.76-37	-8.61-37	-1.51-36	-2.58-36	-4.39-36
27	2.11-32	1.00-38	1.05-38	9.94-39	4.52-39	-1.13-38	-4.72-38	-1.20-37	-2.55-37	-4.96-37	-9.09-37	-1.61-36	-2.82-36	-4.89-36
26	2.37-32	1.13-38	1.21-38	1.20-38	7.25-39	-7.94-39	-4.36-38	-1.17-37	-2.57-37	-5.10-37	-9.51-37	-1.72-36	-3.06-36	-5.44-36
25	2.67-32	1.29-38	1.39-38	1.46-38	1.08-38	-3.25-39	-3.77-38	-1.11-37	-2.53-37	-5.15-37	-9.82-37	-1.81-36	-3.31-36	-6.04-36
24	3.02-32	1.47-38	1.62-38	1.77-38	1.52-38	3.00-39	-2.92-38	-1.00-37	-2.43-37	-5.10-37	-9.98-37	-1.89-36	-3.55-36	-6.71-36
23	3.44-32	1.68-38	1.89-38	2.16-38	2.08-38	1.11-38	-1.76-38	-8.47-38	-2.24-37	-4.92-37	-9.95-37	-1.95-36	-3.79-36	-7.47-36
22	3.95-32	1.94-38	2.22-38	2.63-38	2.77-38	2.15-38	-2.16-39	-6.26-38	-1.94-37	-4.57-37	-9.67-37	-1.97-36	-4.00-36	-8.34-36
21	4.55-32	2.25-38	2.61-38	3.21-38	3.64-38	3.48-38	1.81-38	-3.24-38	-1.51-37	-3.99-37	-9.00-37	-1.94-36	-4.18-36	-9.38-36
20	5.29-32	2.63-38	3.11-38	3.93-38	4.78-38	5.19-38	4.50-38	9.45-39	-8.71-38	-3.05-37	-7.71-37	-1.80-36	-4.24-36	-1.06-35
19	6.19-32	3.11-38	3.72-38	4.84-38	6.16-38	7.46-38	8.18-38	6.92-38	9.88-39	-1.48-37	-5.18-37	-1.43-36	-3.90-36	-1.16-35
18	7.32-32	3.69-38	4.49-38	6.02-38	8.05-38	1.06-37	1.34-37	1.59-37	1.66-37	1.33-37	3.90-39	-4.45-37	-2.20-36	-1.02-35
17	8.74-32	4.44-38	5.49-38	7.58-38	1.06-37	1.50-37	2.12-37	3.01-37	4.35-37	6.68-37	1.16-36	2.29-36	4.95-36	1.09-35
16	1.06-31	5.40-38	6.80-38	9.69-38	1.42-37	2.14-37	3.34-37	5.39-37	9.25-37	1.77-36	4.00-36	1.10-35	4.12-35	3.17-34
15	1.29-31	6.66-38	8.55-38	1.26-37	1.94-37	3.13-37	5.31-37	9.57-37	1.89-36	4.31-36	1.22-35	4.83-35	4.13-34	
14	1.60-31	8.33-38	1.09-37	1.67-37	2.72-37	4.69-37	8.69-37	1.75-36	3.99-36	1.11-35	4.40-35	3.81-34		
13	2.03-31	1.06-37	1.42-37	2.26-37	3.91-37	7.28-37	1.48-36	3.39-36	9.28-36	3.55-35	2.96-34			
12	2.62-31	1.37-37	1.89-37	3.16-37	5.82-37	1.18-36	2.70-36	7.28-36	2.66-35	2.04-34				
11	3.47-31	1.82-37	2.58-37	4.54-37	9.04-37	2.04-36	5.40-36	1.89-35	1.29-34					
10	4.75-31	2.49-37	3.64-37	6.84-37	1.49-36	3.84-36	1.29-35	7.69-35						
9	6.77-31	3.56-37	5.43-37	1.10-36	2.72-36	8.71-36	4.70-35							
8	1.02-30	5.42-37	8.80-37	2.01-36	5.20-36	3.21-35								
7	1.64-30	9.10-37	1.65-36	4.77-36	2.54-35									
6	2.95-30	1.77-36	4.04-36	2.15-35										
5	6.30-30	4.54-36	1.88-35											
4	1.89-29	2.18-35												
3	1.37-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-8.31-37	-1.17-36	-1.63-36	-2.23-36	-3.00-36	-3.97-36	-5.16-36	-6.60-36	-8.32-36	-1.04-35	-1.27-35	-1.55-35	-1.88-35	-2.27-35
45	-1.23-36	-1.77-36	-2.50-36	-3.48-36	-4.78-36	-6.46-36	-8.60-36	-1.13-35	-1.46-35	-1.88-35	-2.39-35	-3.02-35	-3.80-35	-4.79-35
40	-1.93-36	-2.83-36	-4.11-36	-5.88-36	-8.32-36	-1.16-35	-1.61-35	-2.20-35	-2.98-35	-4.01-35	-5.39-35	-7.26-35	-9.82-35	-1.34-34
35	-3.23-36	-4.92-36	-7.43-36	-1.11-35	-1.66-35	-2.46-35	-3.62-35	-5.32-35	-7.84-35	-1.16-34	-1.75-34	-2.69-34	-4.27-34	-7.13-34
30	-5.79-36	-9.43-36	-1.54-35	-2.51-35	-4.14-35	-6.89-35	-1.17-34	-2.03-34	-3.67-34	-7.08-34	-1.51-33	-3.83-33	-1.34-32	-1.03-31
29	-6.56-36	-1.09-35	-1.82-35	-3.06-35	-5.20-35	-9.01-35	-1.60-34	-2.97-34	-5.84-34	-1.27-33	-3.28-33	-1.16-32	-9.06-32	
28	-7.45-36	-1.27-35	-2.17-35	-3.77-35	-6.68-35	-1.22-34	-2.31-34	-4.65-34	-1.04-33	-2.72-33	-9.83-33	-7.78-32		
27	-8.49-36	-1.48-35	-2.63-35	-4.76-35	-8.86-35	-1.72-34	-3.56-34	-8.11-34	-2.18-33	-8.04-33	-6.48-32			
26	-9.71-36	-1.76-35	-3.24-35	-6.17-35	-1.23-34	-2.60-34	-6.08-34	-1.68-33	-6.33-33	-5.22-32				
25	-1.12-35	-2.10-35	-4.08-35	-8.30-35	-1.80-34	-4.33-34	-1.23-33	-4.76-33	-4.03-32					
24	-1.29-35	-2.56-35	-5.33-35	-1.18-34	-2.92-34	-8.49-34	-3.39-33	-2.95-32						
23	-1.52-35	-3.22-35	-7.32-35	-1.85-34	-5.53-34	-2.27-33	-2.04-32							
22	-1.82-35	-4.23-35	-1.09-34	-3.36-34	-1.42-33	-1.32-32								
21	-2.25-35	-5.97-35	-1.88-34	-8.22-34	-7.89-33									
20	-2.92-35	-9.56-35	-4.32-34	-4.29-33										
19	-4.06-35	-1.94-34	-2.04-33											
18	-5.93-35	-7.20-34												
17	-1.06-35													

HE + TE = 1.00+05 NE = 1.00+09 CASE B NC = 26

TOTAL RC = 2.357-13 4-3 RC = 2.620-14 4-3 EM = 1.110-25 2S RC = 8.541-14 2P RC = 1.503-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.27-03	6.97-04	2.99-04	1.55-04	9.05-05	5.73-05	3.86-05	2.72-05	1.99-05	1.50-05	1.15-05	9.10-06	7.29-06	5.93-06
45	3.11-03	9.55-04	4.10-04	2.13-04	1.24-04	7.85-05	5.29-05	3.72-05	2.72-05	2.05-05	1.58-05	1.25-05	9.99-06	8.13-06
40	4.43-03	1.36-03	5.84-04	3.02-04	1.76-04	1.12-04	7.51-05	5.29-05	3.87-05	2.91-05	2.25-05	1.77-05	1.42-05	1.15-05
35	6.59-03	2.02-03	8.68-04	4.49-04	2.62-04	1.66-04	1.12-04	7.87-05	5.75-05	4.33-05	3.34-05	2.63-05	2.10-05	1.71-05
30	1.04-02	3.18-03	1.37-03	7.07-04	4.12-04	2.61-04	1.76-04	1.24-04	9.03-05	6.79-05	5.24-05	4.12-05	3.30-05	2.68-05
29	1.14-02	3.51-03	1.51-03	7.81-04	4.55-04	2.88-04	1.94-04	1.36-04	9.96-05	7.50-05	5.78-05	4.55-05	3.64-05	2.96-05
28	1.27-02	3.89-03	1.67-03	8.64-04	5.04-04	3.19-04	2.14-04	1.51-04	1.10-04	8.29-05	6.39-05	5.03-05	4.02-05	3.27-05
27	1.41-02	4.31-03	1.85-03	9.59-04	5.59-04	3.54-04	2.38-04	1.68-04	1.22-04	9.20-05	7.09-05	5.58-05	4.46-05	3.62-05
26	1.56-02	4.80-03	2.06-03	1.07-03	6.22-04	3.94-04	2.65-04	1.86-04	1.36-04	1.02-04	7.88-05	6.20-05	4.96-05	4.03-05
25	1.75-02	5.36-03	2.30-03	1.19-03	6.95-04	4.40-04	2.96-04	2.08-04	1.52-04	1.14-04	8.80-05	6.91-05	5.53-05	4.49-05
24	1.96-02	6.01-03	2.58-03	1.34-03	7.79-04	4.93-04	3.31-04	2.33-04	1.70-04	1.28-04	9.85-05	7.74-05	6.19-05	5.02-05
23	2.21-02	6.76-03	2.91-03	1.50-03	8.76-04	5.54-04	3.73-04	2.62-04	1.91-04	1.44-04	1.11-04	8.69-05	6.95-05	5.63-05
22	2.49-02	7.64-03	3.28-03	1.70-03	9.90-04	6.26-04	4.21-04	2.96-04	2.16-04	1.62-04	1.25-04	9.80-05	7.82-05	6.33-05
21	2.83-02	8.67-03	3.72-03	1.93-03	1.12-03	7.10-04	4.77-04	3.36-04	2.45-04	1.84-04	1.41-04	1.11-04	8.84-05	7.15-05
20	3.23-02	9.89-03	4.25-03	2.20-03	1.28-03	8.09-04	5.44-04	3.82-04	2.79-04	2.09-04	1.61-04	1.26-04	1.00-04	8.09-05
19	3.70-02	1.13-02	4.87-03	2.52-03	1.47-03	9.28-04	6.23-04	4.38-04	3.19-04	2.39-04	1.84-04	1.44-04	1.14-04	9.18-05
18	4.28-02	1.31-02	5.63-03	2.91-03	1.70-03	1.07-03	7.20-04	5.06-04	3.68-04	2.76-04	2.11-04	1.65-04	1.31-04	1.04-04
17	5.00-02	1.53-02	6.57-03	3.40-03	1.98-03	1.25-03	8.39-04	5.89-04	4.28-04	3.20-04	2.45-04	1.91-04	1.50-04	1.17-04
16	5.89-02	1.81-02	7.75-03	4.01-03	2.33-03	1.47-03	9.88-04	6.93-04	5.03-04	3.76-04	2.86-04	2.21-04	1.71-04	1.26-04
15	7.05-02	2.16-02	9.26-03	4.79-03	2.79-03	1.76-03	1.18-03	8.26-04	5.99-04	4.45-04	3.37-04	2.56-04	1.86-04	
14	8.56-02	2.62-02	1.12-02	5.81-03	3.38-03	2.13-03	1.43-03	9.97-04	7.20-04	5.32-04	3.96-04	2.83-04		
13	1.06-01	3.23-02	1.39-02	7.16-03	4.16-03	2.63-03	1.75-03	1.22-03	8.77-04	6.37-04	4.46-04			
12	1.33-01	4.05-02	1.74-02	8.99-03	5.23-03	3.29-03	2.19-03	1.52-03	1.07-03	7.32-04				
11	1.71-01	5.20-02	2.23-02	1.15-02	6.69-03	4.20-03	2.78-03	1.90-03	1.26-03					
10	2.26-01	6.83-02	2.93-02	1.51-02	8.78-03	5.49-03	3.58-03	2.30-03						
9	3.10-01	9.24-02	3.96-02	2.05-02	1.18-02	7.29-03	4.69-03							
8	4.41-01	1.30-01	5.55-02	2.87-02	1.64-02	9.94-03								
7	6.57-01	1.91-01	8.21-02	4.19-02	2.26-02									
6	1.05+00	3.04-01	1.29-01	6.21-02										
5	1.85+00	5.27-01	2.10-01											
4	3.85+00	1.00+00												
3	1.04+01													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.89-06	4.08-06	3.44-06	2.93-06	2.51-06	2.17-06	1.89-06	1.65-06	1.45-06	1.29-06	1.14-06	1.02-06	9.14-07	8.22-07
45	6.70-06	5.59-06	4.71-06	4.01-06	3.44-06	2.97-06	2.58-06	2.26-06	1.99-06	1.76-06	1.56-06	1.39-06	1.25-06	1.12-06
40	9.51-06	7.93-06	6.68-06	5.68-06	4.87-06	4.21-06	3.66-06	3.20-06	2.81-06	2.48-06	2.21-06	1.97-06	1.76-06	1.58-06
35	1.41-05	1.18-05	9.90-06	8.42-06	7.21-06	6.22-06	5.40-06	4.72-06	4.15-06	3.66-06	3.24-06	2.88-06	2.57-06	2.30-06
30	2.21-05	1.84-05	1.55-05	1.31-05	1.12-05	9.68-06	8.38-06	7.30-06	6.38-06	5.60-06	4.91-06	4.30-06	3.71-06	3.02-06
29	2.43-05	2.03-05	1.70-05	1.45-05	1.24-05	1.06-05	9.21-06	8.01-06	6.98-06	6.10-06	5.31-06	4.57-06	3.71-06	
28	2.69-05	2.24-05	1.88-05	1.60-05	1.36-05	1.17-05	1.01-05	8.78-06	7.63-06	6.61-06	5.66-06	4.58-06		
27	2.98-05	2.48-05	2.08-05	1.77-05	1.51-05	1.29-05	1.11-05	9.63-06	8.30-06	7.07-06	5.70-06			
26	3.31-05	2.75-05	2.31-05	1.96-05	1.67-05	1.43-05	1.23-05	1.05-05	8.90-06	7.14-06				
25	3.69-05	3.07-05	2.57-05	2.17-05	1.85-05	1.57-05	1.34-05	1.13-05	9.02-06					
24	4.12-05	3.42-05	2.86-05	2.41-05	2.04-05	1.73-05	1.45-05	1.15-05						
23	4.62-05	3.83-05	3.20-05	2.68-05	2.26-05	1.88-05	1.48-05							
22	5.19-05	4.29-05	3.57-05	2.97-05	2.46-05	1.92-05								
21	5.84-05	4.81-05	3.97-05	3.25-05	2.53-05									
20	6.59-05	5.38-05	4.37-05	3.37-05										
19	7.42-05	5.96-05	4.55-05											
18	8.28-05	6.26-05												
17	8.78-05													

HE + TE = 1.00+05 NE = 1.00+09 CASE B NC = 26

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.85-33	1.46-39	1.20-39	2.05-40	-2.74-39	-9.18-39	-2.09-38	-4.03-38	-7.03-38	-1.15-37	-1.81-37	-2.72-37	-3.96-37	-5.56-37
45	3.92-33	2.00-39	1.66-39	2.83-40	-3.81-39	-1.28-38	-2.94-38	-5.68-38	-1.00-37	-1.65-37	-2.62-37	-3.98-37	-5.86-37	-8.34-37
40	5.59-33	2.87-39	2.38-39	4.20-40	-5.48-39	-1.86-38	-4.30-38	-8.39-38	-1.49-37	-2.50-37	-4.01-37	-6.19-37	-9.27-37	-1.34-36
35	8.37-33	4.31-39	3.61-39	7.10-40	-8.18-39	-2.83-38	-6.62-38	-1.31-37	-2.37-37	-4.04-37	-6.62-37	-1.05-36	-1.61-36	-2.40-36
30	1.33-32	6.93-39	5.94-39	1.51-39	-1.26-38	-4.51-38	-1.08-37	-2.20-37	-4.07-37	-7.15-37	-1.21-36	-1.99-36	-3.20-36	-5.02-36
29	1.48-32	7.70-39	6.65-39	1.82-39	-1.37-38	-4.98-38	-1.20-37	-2.46-37	-4.59-37	-8.12-37	-1.39-36	-2.31-36	-3.75-36	-5.97-36
28	1.65-32	8.59-39	7.48-39	2.24-39	-1.48-38	-5.50-38	-1.34-37	-2.76-37	-5.19-37	-9.27-37	-1.60-36	-2.69-36	-4.44-36	-7.19-36
27	1.84-32	9.62-39	8.47-39	2.78-39	-1.60-38	-6.07-38	-1.49-37	-3.10-37	-5.88-37	-1.06-36	-1.86-36	-3.17-36	-5.31-36	-8.76-36
26	2.06-32	1.08-38	9.70-39	3.65-39	-1.69-38	-6.62-38	-1.65-37	-3.46-37	-6.64-37	-1.21-36	-2.15-36	-3.73-36	-6.38-36	-1.08-35
25	2.32-32	1.23-38	1.11-38	4.69-39	-1.78-38	-7.27-38	-1.84-37	-3.90-37	-7.57-37	-1.40-36	-2.53-36	-4.47-36	-7.80-36	-1.35-35
24	2.63-32	1.40-38	1.29-38	6.11-39	-1.85-38	-7.94-38	-2.05-37	-4.39-37	-8.65-37	-1.63-36	-2.99-36	-5.40-36	-9.69-36	-1.73-35
23	3.00-32	1.60-38	1.51-38	8.07-39	-1.86-38	-8.61-38	-2.27-37	-4.95-37	-9.89-37	-1.90-36	-3.55-36	-6.60-36	-1.22-35	-2.28-35
22	3.43-32	1.85-38	1.79-38	1.08-38	-1.79-38	-9.22-38	-2.50-37	-5.56-37	-1.13-36	-2.22-36	-4.27-36	-8.18-36	-1.58-35	-3.09-35
21	3.96-32	2.15-38	2.13-38	1.45-38	-1.59-38	-9.71-38	-2.73-37	-6.21-37	-1.29-36	-2.60-36	-5.16-36	-1.03-35	-2.09-35	-4.36-35
20	4.60-32	2.53-38	2.57-38	1.96-38	-1.19-38	-9.97-38	-2.95-37	-6.90-37	-1.48-36	-3.06-36	-6.32-36	-1.32-35	-2.87-35	-6.54-35
19	5.39-32	2.99-38	3.14-38	2.67-38	-5.05-39	-9.87-38	-3.14-37	-7.60-37	-1.68-36	-3.62-36	-7.84-36	-1.75-35	-4.14-35	-1.07-34
18	6.37-32	3.58-38	3.88-38	3.64-38	5.63-39	-9.27-38	-3.27-37	-8.30-37	-1.91-36	-4.31-36	-9.96-36	-2.43-35	-6.50-35	-2.04-34
17	7.61-32	4.32-38	4.84-38	4.95-38	2.15-38	-7.97-38	-3.33-37	-8.99-37	-2.18-36	-5.23-36	-1.32-35	-3.63-35	-1.18-34	-5.22-34
16	9.19-32	5.29-38	6.10-38	6.74-38	4.44-38	-5.75-38	-3.30-37	-9.72-37	-2.52-36	-6.57-36	-1.87-35	-6.23-35	-2.85-34	-2.85-33
15	1.12-31	6.56-38	7.79-38	9.20-38	7.74-38	-2.22-38	-3.16-37	-1.06-36	-3.00-36	-8.82-36	-3.02-35	-1.42-34	-1.46-33	
14	1.40-31	8.26-38	1.01-37	1.27-37	1.26-37	3.55-38	-2.79-37	-1.15-36	-3.74-36	-1.33-35	-6.37-35	-6.73-34		
13	1.77-31	1.06-37	1.34-37	1.78-37	2.04-37	1.38-37	-1.81-37	-1.21-36	-4.93-36	-2.46-35	-2.65-34			
12	2.28-31	1.39-37	1.82-37	2.58-37	3.34-37	3.40-37	1.01-37	-9.48-37	-6.38-36	-7.27-35				
11	3.03-31	1.87-37	2.55-37	3.89-37	5.76-37	7.96-37	1.03-36	1.59-36	7.04-36					
10	4.14-31	2.61-37	3.73-37	6.21-37	1.08-36	2.03-36	5.16-36	3.46-35						
9	5.89-31	3.79-37	5.76-37	1.08-36	2.32-36	6.58-36	4.15-35							
8	8.84-31	5.81-37	9.59-37	2.13-36	6.39-36	3.86-35								
7	1.43-30	9.68-37	1.81-36	5.29-36	3.08-35									
6	2.56-30	1.85-36	4.33-36	2.33-35										
5	5.49-30	4.68-36	1.91-35											
4	1.64-29	2.19-35												
3	1.19-28													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-7.53-37	-9.85-37	-1.25-36	-1.53-36	-1.83-36	-2.15-36	-2.48-36	-2.83-36	-3.21-36	-3.61-36	-4.05-36	-4.46-36	-5.00-36	-5.62-36
45	-1.15-36	-1.52-36	-1.96-36	-2.45-36	-2.99-36	-3.59-36	-4.25-36	-4.98-36	-5.80-36	-6.75-36	-7.84-36	-8.96-36	-1.05-35	-1.24-35
40	-1.89-36	-2.56-36	-3.38-36	-4.35-36	-5.48-36	-6.79-36	-8.35-36	-1.02-35	-1.24-35	-1.52-35	-1.87-35	-2.29-35	-2.88-35	-3.70-35
35	-3.48-36	-4.91-36	-6.74-36	-9.07-36	-1.20-35	-1.58-35	-2.07-35	-2.71-35	-3.60-35	-4.86-35	-6.70-35	-9.37-35	-1.39-34	-2.19-34
30	-7.70-36	-1.16-35	-1.71-35	-2.50-35	-3.65-35	-5.37-35	-8.06-35	-1.25-34	-2.03-34	-3.57-34	-7.00-34	-1.62-33	-5.30-33	-3.88-32
29	-9.31-36	-1.43-35	-2.15-35	-3.23-35	-4.87-35	-7.45-35	-1.17-34	-1.93-34	-3.42-34	-6.77-34	-1.60-33	-5.20-33	-3.81-32	
28	-1.14-35	-1.79-35	-2.77-35	-4.30-35	-6.73-35	-1.08-34	-1.81-34	-3.24-34	-6.47-34	-1.54-33	-5.11-33	-3.72-32		
27	-1.42-35	-2.29-35	-3.67-35	-5.90-35	-9.69-35	-1.65-34	-3.01-34	-6.09-34	-1.47-33	-4.89-33	-3.57-32			
26	-1.80-35	-2.98-35	-4.96-35	-8.37-35	-1.46-34	-2.71-34	-5.56-34	-1.35-33	-4.56-33	-3.38-32				
25	-2.33-35	-4.02-35	-7.02-35	-1.26-34	-2.40-34	-5.01-34	-1.24-33	-4.24-33	-3.18-32					
24	-3.11-35	-5.63-35	-1.05-34	-2.05-34	-4.39-34	-1.11-33	-3.85-33	-2.93-32						
23	-4.29-35	-8.29-35	-1.68-34	-3.71-34	-9.61-34	-3.40-33	-2.63-32							
22	-6.21-35	-1.31-34	-2.99-34	-7.99-34	-2.90-33	-2.30-32								
21	-9.57-35	-2.28-34	-6.32-34	-2.37-33	-1.92-32									
20	-1.62-34	-4.69-34	-1.83-33	-1.53-32										
19	-3.23-34	-1.21-33	-1.15-32											
18	-8.67-34	-7.93-33												
17	-5.00-33													

HE + TE = 1.00+05 NE = 1.00+10 CASE B NC = 20

TOTAL RC = 2.373-13 4-3 RC = 2.578-14 4-3 EM = 1.093-25 2S RC = 8.584-14 2P RC = 1.515-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.31-03	7.09-04	3.05-04	1.58-04	9.21-05	5.83-05	3.92-05	2.77-05	2.02-05	1.52-05	1.17-05	9.25-06	7.42-06	6.04-06
45	3.17-03	9.73-04	4.18-04	2.17-04	1.26-04	8.00-05	5.38-05	3.79-05	2.77-05	2.09-05	1.61-05	1.27-05	1.02-05	8.28-06
40	4.52-03	1.39-03	5.95-04	3.08-04	1.80-04	1.14-04	7.66-05	5.40-05	3.95-05	2.97-05	2.29-05	1.80-05	1.45-05	1.18-05
35	6.74-03	2.07-03	8.88-04	4.60-04	2.68-04	1.70-04	1.14-04	8.05-05	5.88-05	4.43-05	3.42-05	2.69-05	2.15-05	1.75-05
30	1.07-02	3.28-03	1.41-03	7.30-04	4.25-04	2.69-04	1.81-04	1.28-04	9.32-05	7.01-05	5.40-05	4.25-05	3.41-05	2.77-05
29	1.18-02	3.63-03	1.56-03	8.07-04	4.71-04	2.98-04	2.00-04	1.41-04	1.03-04	7.75-05	5.98-05	4.70-05	3.76-05	3.06-05
28	1.31-02	4.03-03	1.73-03	8.96-04	5.23-04	3.31-04	2.22-04	1.57-04	1.14-04	8.60-05	6.63-05	5.22-05	4.18-05	3.39-05
27	1.47-02	4.49-03	1.93-03	9.99-04	5.82-04	3.69-04	2.48-04	1.74-04	1.27-04	9.58-05	7.38-05	5.81-05	4.65-05	3.77-05
26	1.64-02	5.03-03	2.16-03	1.12-03	6.51-04	4.12-04	2.77-04	1.95-04	1.42-04	1.07-04	8.25-05	6.49-05	5.19-05	4.21-05
25	1.84-02	5.65-03	2.43-03	1.26-03	7.31-04	4.63-04	3.11-04	2.19-04	1.60-04	1.20-04	9.26-05	7.28-05	5.82-05	4.72-05
24	2.08-02	6.37-03	2.74-03	1.42-03	8.25-04	5.22-04	3.51-04	2.47-04	1.80-04	1.35-04	1.04-04	8.19-05	6.55-05	5.31-05
23	2.36-02	7.22-03	3.10-03	1.60-03	9.35-04	5.91-04	3.97-04	2.80-04	2.04-04	1.53-04	1.18-04	9.27-05	7.40-05	6.00-05
22	2.68-02	8.23-03	3.53-03	1.83-03	1.06-03	6.73-04	4.52-04	3.18-04	2.32-04	1.74-04	1.34-04	1.05-04	8.40-05	6.80-05
21	3.07-02	9.42-03	4.04-03	2.09-03	1.22-03	7.71-04	5.17-04	3.64-04	2.65-04	1.99-04	1.53-04	1.20-04	9.58-05	7.74-05
20	3.54-02	1.08-02	4.65-03	2.41-03	1.40-03	8.86-04	5.95-04	4.18-04	3.05-04	2.29-04	1.76-04	1.38-04	1.10-04	8.84-05
19	4.09-02	1.25-02	5.38-03	2.78-03	1.62-03	1.02-03	6.88-04	4.83-04	3.52-04	2.64-04	2.03-04	1.58-04	1.26-04	1.01-04
18	4.77-02	1.46-02	6.27-03	3.24-03	1.89-03	1.19-03	8.00-04	5.62-04	4.09-04	3.06-04	2.35-04	1.83-04	1.45-04	1.15-04
17	5.59-02	1.71-02	7.35-03	3.80-03	2.21-03	1.40-03	9.35-04	6.56-04	4.77-04	3.57-04	2.73-04	2.12-04	1.67-04	1.30-04
16	6.60-02	2.02-02	8.67-03	4.48-03	2.60-03	1.64-03	1.10-03	7.72-04	5.60-04	4.18-04	3.18-04	2.46-04	1.90-04	1.40-04
15	7.85-02	2.40-02	1.03-02	5 32-03	3.09-03	1.95-03	1.31-03	9.14-04	6.62-04	4.92-04	3.72-04	2.82-04	2.05-04	
14	9.44-02	2.89-02	1.24-02	6.39-03	3.71-03	2.34-03	1.56-03	1.09-03	7.87-04	5.81-04	4.31-04	3.08-04		
13	1.15-01	3.52-02	1.51-02	7.77-03	4.51-03	2.84-03	1.89-03	1.32-03	9.42-04	6.83-04	4.78-04			
12	1.43-01	4.36-02	1.86-02	9.61-03	5.57-03	3.50-03	2.32-03	1.60-03	1.13-03	7.71-04				
11	1.81-01	5.53-02	2.36-02	1.22-02	7.04-03	4.40-03	2.90-03	1.97-03	1.31-03					
10	2.37-01	7.22-02	3.08-02	1.58-02	9.12-03	5.67-03	3.68-03	2.35-03						
9	3.21-01	9.74-02	4.15-02	2.12-02	1.22-02	7.43-03	4.54-03							
8	4.54-01	1.37-01	5.80-02	2.95-02	1.66-02	9.57-03								
7	6.81-01	2.01-01	8.46-02	4.24-02	2.25-02									
6	1.10+00	3.15-01	1.30-01	6.15-02										
5	1.94+00	5.34-01	2.08-01											
4	3.97+00	1.00+00												
3	1.06+01													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.98-06	4.15-06	3.50-06	2.98-06	2.55-06	2.21-06	1.92-06	1.68-06	1.48-06	1.31-06	1.16-06	1.04-06	9.30-07	8.37-07
45	6.82-06	5.69-06	4.80-06	4.08-06	3.50-06	3.02-06	2.63-06	2.30-06	2.02-06	1.79-06	1.59-06	1.42-06	1.27-06	1.14-06
40	9.70-06	8.09-06	6.82-06	5.80-06	4.97-06	4.29-06	3.73-06	3.26-06	2.87-06	2.53-06	2.25-06	2.01-06	1.80-06	1.61-06
35	1.44-05	1.20-05	1.01-05	8.61-06	7.38-06	6.37-06	5.53-06	4.83-06	4.24-06	3.74-06	3.32-06	2.95-06	2.63-06	2.35-06
30	2.28-05	1.90-05	1.60-05	1.36-05	1.16-05	9.99-06	8.65-06	7.53-06	6.59-06	5.77-06	5.07-06	4.43-06	3.83-06	3.12-06
29	2.52-05	2.10-05	1.76-05	1.50-05	1.28-05	1.10-05	9.52-06	8.28-06	7.22-06	6.31-06	5.49-06	4.72-06	3.84-06	
28	2.79-05	2.32-05	1.95-05	1.66-05	1.41-05	1.22-05	1.05-05	9.11-06	7.92-06	6.86-06	5.87-06	4.75-06		
27	3.10-05	2.58-05	2.17-05	1.84-05	1.57-05	1.35-05	1.16-05	1.00-05	8.64-06	7.36-06	5.93-06			
26	3.47-05	2.88-05	2.42-05	2.05-05	1.74-05	1.49-05	1.28-05	1.10-05	9.31-06	7.46-06				
25	3.88-05	3.22-05	2.70-05	2.28-05	1.94-05	1.66-05	1.41-05	1.19-05	9.48-06					
24	4.36-05	3.62-05	3.03-05	2.55-05	2.16-05	1.83-05	1.53-05	1.22-05						
23	4.92-05	4.08-05	3.41-05	2.86-05	2.40-05	2.00-05	1.57-05							
22	5.57-05	4.61-05	3.83-05	3.19-05	2.64-05	2.06-05								
21	6.33-05	5.21-05	4.30-05	3.52-05	2.74-05									
20	7.19-05	5.88-05	4.77-05	3.67-05										
19	8.16-05	6.56-05	5.01-05											
18	9.17-05	6.93-05												
17	9.75-05													

HE + TE = 1.00+05 NE = 1.00+10 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.27-33	1.37-39	8.84-40	-6.36-40	-4.17-39	-1.07-38	-2.18-38	-3.93-38	-6.55-38	-1.01-37	-1.45-37	-1.93-37	-2.41-37	-2.84-37
45	1.74-33	1.88-39	1.22-39	-8.90-40	-5.82-39	-1.50-38	-3.06-38	-5.56-38	-9.36-38	-1.46-37	-2.11-37	-2.84-37	-3.59-37	-4.29-37
40	2.49-33	2.69-39	1.74-39	-1.30-39	-8.48-39	-2.20-38	-4.53-38	-8.32-38	-1.41-37	-2.23-37	-3.27-37	-4.47-37	-5.75-37	-7.02-37
35	3.72-33	4.04-39	2.61-39	-2.01-39	-1.31-38	-3.41-38	-7.12-38	-1.33-37	-2.29-37	-3.68-37	-5.52-37	-7.74-37	-1.02-36	-1.29-36
30	5.94-33	6.47-39	4.19-39	-3.32-39	-2.16-38	-5.74-38	-1.22-37	-2.33-37	-4.12-37	-6.82-37	-1.06-36	-1.55-36	-2.14-36	-2.84-36
29	6.58-33	7.18-39	4.66-39	-3.70-39	-2.42-38	-6.45-38	-1.38-37	-2.64-37	-4.71-37	-7.87-37	-1.23-36	-1.82-36	-2.55-36	-3.43-36
28	7.32-33	8.00-39	5.21-39	-4.14-39	-2.72-38	-7.28-38	-1.56-37	-3.02-37	-5.42-37	-9.15-37	-1.45-36	-2.17-36	-3.08-36	-4.22-36
27	8.18-33	8.95-39	5.84-39	-4.64-39	-3.07-38	-8.25-38	-1.78-37	-3.47-37	-6.29-37	-1.07-36	-1.72-36	-2.61-36	-3.77-36	-5.27-36
26	9.17-33	1.01-38	6.59-39	-5.22-39	-3.47-38	-9.41-38	-2.05-37	-4.02-37	-7.37-37	-1.27-36	-2.07-36	-3.19-36	-4.70-36	-6.71-36
25	1.03-32	1.14-38	7.48-39	-5.87-39	-3.95-38	-1.08-37	-2.37-37	-4.69-37	-8.70-37	-1.52-36	-2.52-36	-3.96-36	-5.96-36	-8.75-36
24	1.17-32	1.29-38	8.55-39	-6.61-39	-4.52-38	-1.24-37	-2.76-37	-5.53-37	-1.04-36	-1.85-36	-3.12-36	-5.01-36	-7.75-36	-1.17-35
23	1.33-32	1.47-38	9.85-39	-7.43-39	-5.19-38	-1.44-37	-3.23-37	-6.57-37	-1.25-36	-2.27-36	-3.92-36	-6.47-36	-1.03-35	-1.63-35
22	1.53-32	1.69-38	1.15-38	-8.33-39	-5.99-38	-1.69-37	-3.82-37	-7.89-37	-1.53-36	-2.84-36	-5.04-36	-8.59-36	-1.43-35	-2.37-35
21	1.76-32	1.96-38	1.35-38	-9.26-39	-6.94-38	-1.98-37	-4.56-37	-9.58-37	-1.91-36	-3.63-36	-6.64-36	-1.18-35	-2.06-35	-3.63-35
20	2.05-32	2.29-38	1.61-38	-9.93-39	-8.01-38	-2.33-37	-5.46-37	-1.17-36	-2.39-36	-4.70-36	-8.96-36	-1.67-35	-3.11-35	-5.98-35
19	2.40-32	2.71-38	1.95-38	-1.05-38	-9.29-38	-2.76-37	-6.62-37	-1.46-36	-3.07-36	-6.29-36	-1.26-35	-2.51-35	-5.09-35	-1.11-34
18	2.83-32	3.23-38	2.39-38	-1.04-38	-1.07-37	-3.29-37	-8.09-37	-1.84-36	-4.04-36	-8.69-36	-1.86-35	-4.03-35	-9.27-35	-2.44-34
17	3.38-32	3.90-38	3.01-38	-9.02-39	-1.23-37	-3.92-37	-9.97-37	-2.36-36	-5.44-36	-1.25-35	-2.92-35	-7.19-35	-2.00-34	-7.42-34
16	4.09-32	4.78-38	3.87-38	-5.32-39	-1.40-37	-4.66-37	-1.24-36	-3.07-36	-7.58-36	-1.91-35	-5.05-35	-1.51-34	-5.92-34	-4.91-33
15	5.00-32	5.95-38	5.09-38	2.60-39	-1.54-37	-5.51-37	-1.54-36	-4.09-36	-1.10-35	-3.15-35	-1.02-34	-4.29-34	-3.78-33	
14	6.21-32	7.54-38	6.88-38	1.77-38	-1.62-37	-6.44-37	-1.93-36	-5.61-36	-1.72-35	-5.98-35	-2.73-34	-2.60-33		
13	7.86-32	9.75-38	9.52-38	4.43-38	-1.58-37	-7.43-37	-2.46-36	-8.11-36	-3.02-35	-1.49-34	-1.54-33			
12	1.02-31	1.29-37	1.35-37	8.95-38	-1.36-37	-8.54-37	-3.26-36	-1.30-35	-6.87-35	-7.68-34				
11	1.35-31	1.76-37	1.97-37	1.66-37	-8.45-38	-1.01-36	-4.84-36	-2.71-35	-3.20-34					
10	1.84-31	2.48-37	2.97-37	3.00-37	2.55-38	-1.30-36	-9.15-36	-1.15-34						
9	2.62-31	3.67-37	4.75-37	5.68-37	3.02-37	-2.04-36	-3.45-35							
8	3.93-31	5.77-37	8.24-37	1.20-36	1.26-36	-5.36-36								
7	6.35-31	9.89-37	1.63-36	3.23-36	8.40-36									
6	1.14-30	1.93-36	4.08-36	1.65-35										
5	2.44-30	4.81-36	1.85-35											
4	7.30-30	2.22-35												
3	5.29-29													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-3.20-37	-3.49-37	-3.71-37	-3.84-37	-3.90-37	-3.79-37	-3.69-37	-3.48-37	-3.17-37	-2.71-37	-2.08-37	-1.25-37	-1.25-38	1.34-37
45	-4.92-37	-5.46-37	-5.91-37	-6.28-37	-6.55-37	-6.56-37	-6.63-37	-6.56-37	-6.33-37	-5.88-37	-5.15-37	-4.05-37	-2.39-37	-1.07-39
40	-8.23-37	-9.38-37	-1.05-36	-1.15-36	-1.24-36	-1.31-36	-1.39-36	-1.47-36	-1.53-36	-1.57-36	-1.58-36	-1.54-36	-1.39-36	-1.09-36
35	-1.56-36	-1.86-36	-2.17-36	-2.50-36	-2.88-36	-3.25-36	-3.76-36	-4.36-36	-5.11-36	-6.04-36	-7.25-36	-8.88-36	-1.11-35	-1.42-35
30	-3.66-36	-4.65-36	-5.87-36	-7.45-36	-9.56-36	-1.23-35	-1.65-35	-2.32-35	-3.43-35	-5.47-35	-9.77-35	-2.10-34	-6.24-34	-4.16-33
29	-4.51-36	-5.84-36	-7.55-36	-9.85-36	-1.31-35	-1.75-35	-2.48-35	-3.71-35	-6.01-35	-1.09-34	-2.36-34	-7.19-34	-4.81-33	
28	-5.64-36	-7.48-36	-9.95-36	-1.34-35	-1.85-35	-2.61-35	-3.96-35	-6.47-35	-1.19-34	-2.61-34	-8.02-34	-5.52-33		
27	-7.21-36	-9.83-36	-1.35-35	-1.89-35	-2.75-35	-4.14-35	-6.85-35	-1.27-34	-2.83-34	-8.75-34	-6.02-33			
26	-9.44-36	-1.33-35	-1.90-35	-2.80-35	-4.35-35	-7.14-35	-1.34-34	-3.00-34	-9.44-34	-6.57-33				
25	-1.27-35	-1.86-35	-2.80-35	-4.41-35	-7.45-35	-1.39-34	-3.14-34	-9.94-34	-7.02-33					
24	-1.77-35	-2.73-35	-4.38-35	-7.52-35	-1.44-34	-3.24-34	-1.03-33	-7.32-33						
23	-2.59-35	-4.25-35	-7.43-35	-1.44-34	-3.34-34	-1.06-33	-7.58-33							
22	-4.01-35	-7.17-35	-1.42-34	-3.32-34	-1.08-33	-7.69-33								
21	-6.71-35	-1.36-34	-3.25-34	-1.07-33	-7.71-33									
20	-1.25-34	-3.05-34	-1.02-33	-7.50-33										
19	-2.79-34	-9.59-34	-7.18-33											
18	-8.66-34	-6.65-33												
17	-5.89-33													

HE + TE = 1.00+05 NE = 1.00+11 CASE B NC = 20

TOTAL RC = 2.403-13 4-3 RC = 2.596-14 4-3 EM = 1.100-25 2S RC = 8.512-14 2P RC = 1.552-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.29-03	7.04-04	3.03-04	1.57-04	9.14-05	5.79-05	3.90-05	2.75-05	2.01-05	1.51-05	1.17-05	9.19-06	7.37-06	6.00-06
45	3.15-03	9.66-04	4.15-04	2.15-04	1.25-04	7.95-05	5.35-05	3.77-05	2.75-05	2.07-05	1.60-05	1.26-05	1.01-05	8.22-06
40	4.49-03	1.38-03	5.92-04	3.06-04	1.79-04	1.13-04	7.61-05	5.36-05	3.92-05	2.95-05	2.28-05	1.79-05	1.44-05	1.17-05
35	6.70-03	2.06-03	8.84-04	4.58-04	2.67-04	1.69-04	1.14-04	8.01-05	5.85-05	4.40-05	3.40-05	2.67-05	2.14-05	1.74-05
30	1.07-02	3.27-03	1.40-03	7.27-04	4.24-04	2.68-04	1.80-04	1.27-04	9.28-05	6.98-05	5.38-05	4.24-05	3.39-05	2.76-05
29	1.18-02	3.62-03	1.55-03	8.05-04	4.69-04	2.97-04	2.00-04	1.41-04	1.03-04	7.73-05	5.96-05	4.69-05	3.75-05	3.05-05
28	1.31-02	4.02-03	1.73-03	8.94-04	5.21-04	3.30-04	2.22-04	1.56-04	1.14-04	8.58-05	6.62-05	5.20-05	4.17-05	3.38-05
27	1.46-02	4.49-03	1.93-03	9.98-04	5.82-04	3.68-04	2.47-04	1.74-04	1.27-04	9.57-05	7.37-05	5.80-05	4.64-05	3.77-05
26	1.64-02	5.03-03	2.16-03	1.12-03	6.51-04	4.12-04	2.77-04	1.95-04	1.42-04	1.07-04	8.25-05	6.49-05	5.19-05	4.21-05
25	1.84-02	5.65-03	2.43-03	1.26-03	7.33-04	4.64-04	3.12-04	2.19-04	1.60-04	1.20-04	9.27-05	7.29-05	5.83-05	4.73-05
24	2.09-02	6.39-03	2.75-03	1.42-03	8.28-04	5.24-04	3.52-04	2.48-04	1.81-04	1.36-04	1.05-04	8.22-05	6.57-05	5.33-05
23	2.37-02	7.26-03	3.12-03	1.61-03	9.40-04	5.95-04	4.00-04	2.81-04	2.05-04	1.54-04	1.19-04	9.32-05	7.45-05	6.03-05
22	2.71-02	8.30-03	3.56-03	1.84-03	1.07-03	6.79-04	4.56-04	3.21-04	2.34-04	1.76-04	1.35-04	1.06-04	8.48-05	6.86-05
21	3.11-02	9.54-03	4.10-03	2.12-03	1.23-03	7.80-04	5.24-04	3.69-04	2.69-04	2.02-04	1.55-04	1.22-04	9.70-05	7.84-05
20	3.60-02	1.10-02	4.74-03	2.45-03	1.43-03	9.02-04	6.06-04	4.26-04	3.10-04	2.33-04	1.79-04	1.40-04	1.12-04	8.99-05
19	4.20-02	1.29-02	5.52-03	2.85-03	1.66-03	1.05-03	7.05-04	4.95-04	3.61-04	2.70-04	2.08-04	1.62-04	1.29-04	1.04-04
18	4.93-02	1.51-02	6.48-03	3.35-03	1.95-03	1.23-03	8.26-04	5.80-04	4.22-04	3.16-04	2.42-04	1.89-04	1.50-04	1.19-04
17	5.84-02	1.79-02	7.67-03	3.97-03	2.31-03	1.46-03	9.77-04	6.85-04	4.98-04	3.72-04	2.85-04	2.21-04	1.74-04	1.36-04
16	6.98-02	2.14-02	9.17-03	4.73-03	2.75-03	1.74-03	1.16-03	8.16-04	5.92-04	4.42-04	3.36-04	2.59-04	2.00-04	1.47-04
15	8.42-02	2.58-02	1.11-02	5.71-03	3.32-03	2.09-03	1.40-03	9.79-04	7.09-04	5.27-04	3.98-04	3.02-04	2.19-04	
14	1.03-01	3.14-02	1.35-02	6.95-03	4.04-03	2.54-03	1.70-03	1.19-03	8.55-04	6.30-04	4.68-04	3.34-04		
13	1.27-01	3.87-02	1.66-02	8.55-03	4.96-03	3.12-03	2.08-03	1.44-03	1.03-03	7.49-04	5.24-04			
12	1.58-01	4.83-02	2.06-02	1.06-02	6.16-03	3.86-03	2.56-03	1.77-03	1.25-03	8.49-04				
11	2.00-01	6.09-02	2.60-02	1.34-02	7.74-03	4.84-03	3.19-03	2.16-03	1.43-03					
10	2.57-01	7.83-02	3.34-02	1.71-02	9.86-03	6.12-03	3.96-03	2.53-03						
9	3.40-01	1.03-01	4.40-02	2.25-02	1.28-02	7.83-03	4.77-03							
8	4.70-01	1.42-01	6.04-02	3.06-02	1.72-02	9.87-03								
7	6.89-01	2.08-01	8.73-02	4.35-02	2.30-02									
6	1.09+00	3.24-01	1.33-01	6.25-02										
5	1.94+00	5.49-01	2.11-01											
4	4.06+00	1.00+00												
3	1.06+01													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.95-06	4.13-06	3.48-06	2.96-06	2.54-06	2.19-06	1.91-06	1.67-06	1.47-06	1.30-06	1.15-06	1.03-06	9.24-07	8.31-07
45	6.78-06	5.66-06	4.77-06	4.05-06	3.48-06	3.00-06	2.61-06	2.28-06	2.01-06	1.78-06	1.58-06	1.41-06	1.26-06	1.14-06
40	9.68-06	8.04-06	6.77-06	5.76-06	4.94-06	4.26-06	3.71-06	3.24-06	2.85-06	2.52-06	2.24-06	1.99-06	1.78-06	1.60-06
35	1.44-05	1.20-05	1.01-05	8.57-06	7.34-06	6.33-06	5.50-06	4.81-06	4.22-06	3.72-06	3.30-06	2.93-06	2.62-06	2.34-06
30	2.27-05	1.89-05	1.59-05	1.35-05	1.16-05	9.95-06	8.62-06	7.51-06	6.56-06	5.75-06	5.05-06	4.42-06	3.81-06	3.11-06
29	2.51-05	2.09-05	1.76-05	1.49-05	1.28-05	1.10-05	9.50-06	8.26-06	7.20-06	6.29-06	5.48-06	4.71-06	3.82-06	
28	2.79-05	2.32-05	1.95-05	1.65-05	1.41-05	1.21-05	1.05-05	9.09-06	7.90-06	6.85-06	5.86-06	4.74-06		
27	3.10-05	2.58-05	2.17-05	1.84-05	1.57-05	1.34-05	1.16-05	1.00-05	8.63-06	7.35-06	5.92-06			
26	3.46-05	2.88-05	2.42-05	2.05-05	1.74-05	1.49-05	1.28-05	1.10-05	9.31-06	7.46-06				
25	3.89-05	3.23-05	2.71-05	2.29-05	1.94-05	1.66-05	1.41-05	1.19-05	9.49-06					
24	4.38-05	3.63-05	3.04-05	2.56-05	2.17-05	1.84-05	1.54-05	1.22-05						
23	4.95-05	4.10-05	3.43-05	2.88-05	2.42-05	2.01-05	1.58-05							
22	5.62-05	4.65-05	3.86-05	3.22-05	2.66-05	2.08-05								
21	6.41-05	5.27-05	4.35-05	3.57-05	2.77-05									
20	7.32-05	5.98-05	4.85-05	3.74-05										
19	8.36-05	6.72-05	5.13-05											
18	9.46-05	7.15-05												
17	1.02-04													

HE + TE = 1.00+05 NE = 1.00+11 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	1.95-34	1.03-39	2.81-40	-1.27-39	-4.28-39	-9.62-39	-1.78-38	-2.80-38	-3.73-38	-4.31-38	-4.43-38	-4.05-38	-3.19-38	-1.85-38
45	2.68-34	1.41-39	3.84-40	-1.77-39	-5.97-39	-1.35-38	-2.52-38	-3.97-38	-5.35-38	-6.26-38	-6.52-38	-6.08-38	-4.95-38	-3.10-38
40	3.83-34	2.02-39	5.44-40	-2.58-39	-8.71-39	-1.98-38	-3.72-38	-5.94-38	-8.10-38	-9.63-38	-1.02-37	-9.82-38	-8.33-38	-5.72-38
35	5.73-34	3.02-39	8.04-40	-3.96-39	-1.35-38	-3.09-38	-5.89-38	-9.54-38	-1.32-37	-1.61-37	-1.77-37	-1.76-37	-1.59-37	-1.21-37
30	9.14-34	4.83-39	1.26-39	-6.57-39	-2.25-38	-5.25-38	-1.02-37	-1.70-37	-2.43-37	-3.06-37	-3.51-37	-3.72-37	-3.64-37	-3.21-37
29	1.01-33	5.36-39	1.39-39	-7.35-39	-2.53-38	-5.92-38	-1.16-37	-1.93-37	-2.79-37	-3.56-37	-4.13-37	-4.44-37	-4.44-37	-4.05-37
28	1.13-33	5.97-39	1.54-39	-8.27-39	-2.85-38	-6.71-38	-1.32-37	-2.22-37	-3.23-37	-4.17-37	-4.90-37	-5.37-37	-5.50-37	-5.19-37
27	1.26-33	6.67-39	1.72-39	-9.35-39	-3.23-38	-7.65-38	-1.51-37	-2.57-37	-3.78-37	-4.93-37	-5.89-37	-6.58-37	-6.92-37	-6.79-37
26	1.41-33	7.49-39	1.92-39	-1.06-38	-3.69-38	-8.78-38	-1.75-37	-3.00-37	-4.46-37	-5.91-37	-7.18-37	-8.20-37	-8.88-37	-9.07-37
25	1.59-33	8.46-39	2.15-39	-1.21-38	-4.23-38	-1.01-37	-2.04-37	-3.54-37	-5.33-37	-7.16-37	-8.88-37	-1.04-36	-1.16-36	-1.24-36
24	1.80-33	9.59-39	2.42-39	-1.40-38	-4.89-38	-1.18-37	-2.40-37	-4.21-37	-6.44-37	-8.82-37	-1.12-36	-1.35-36	-1.57-36	-1.76-36
23	2.05-33	1.09-38	2.75-39	-1.62-38	-5.70-38	-1.39-37	-2.86-37	-5.08-37	-7.90-37	-1.11-36	-1.44-36	-1.79-36	-2.17-36	-2.58-36
22	2.35-33	1.26-38	3.14-39	-1.89-38	-6.70-38	-1.65-37	-3.44-37	-6.21-37	-9.86-37	-1.41-36	-1.90-36	-2.46-36	-3.13-36	-3.98-36
21	2.71-33	1.45-38	3.62-39	-2.22-38	-7.95-38	-1.98-37	-4.19-37	-7.73-37	-1.25-36	-1.85-36	-2.58-36	-3.50-36	-4.73-36	-6.53-36
20	3.15-33	1.69-38	4.22-39	-2.64-38	-9.53-38	-2.41-37	-5.19-37	-9.78-37	-1.63-36	-2.50-36	-3.63-36	-5.21-36	-7.58-36	-1.16-35
19	3.69-33	1.99-38	4.98-39	-3.16-38	-1.16-37	-2.98-37	-6.55-37	-1.27-36	-2.19-36	-3.49-36	-5.36-36	-8.25-36	-1.32-35	-2.32-35
18	4.36-33	2.37-38	5.98-39	-3.82-38	-1.42-37	-3.73-37	-8.43-37	-1.69-36	-3.04-36	-5.10-36	-8.40-36	-1.42-35	-2.60-35	-5.59-35
17	5.21-33	2.84-38	7.33-39	-4.67-38	-1.77-37	-4.77-37	-1.11-36	-2.32-36	-4.40-36	-7.91-36	-1.43-35	-2.75-35	-6.16-35	-1.88-34
16	6.29-33	3.46-38	9.26-39	-5.75-38	-2.24-37	-6.23-37	-1.51-36	-3.32-36	-6.73-36	-1.33-35	-2.72-35	-6.39-35	-2.03-34	-1.41-33
15	7.70-33	4.28-38	1.22-38	-7.14-38	-2.88-37	-8.34-37	-2.13-36	-5.00-36	-1.11-35	-2.48-35	-6.21-35	-2.07-34	-1.48-33	
14	9.56-33	5.40-38	1.68-38	-8.88-38	-3.77-37	-1.15-36	-3.14-36	-8.06-36	-2.04-35	-5.55-35	-1.96-34	-1.47-33		
13	1.21-32	6.98-38	2.47-38	-1.10-37	-4.99-37	-1.63-36	-4.89-36	-1.43-35	-4.41-35	-1.70-34	-1.36-33			
12	1.56-32	9.27-38	3.90-38	-1.32-37	-6.68-37	-2.41-36	-8.24-36	-2.95-35	-1.29-34	-1.13-33				
11	2.07-32	1.28-37	6.59-38	-1.48-37	-8.95-37	-3.72-36	-1.57-35	-8.06-35	-8.01-34					
10	2.83-32	1.83-37	1.18-37	-1.39-37	-1.19-36	-6.22-36	-3.79-35	-4.48-34						
9	4.03-32	2.76-37	2.22-37	-6.34-38	-1.57-36	-1.25-35	-1.78-34							
8	6.05-32	4.44-37	4.35-37	1.72-37	-2.24-36	-4.63-35								
7	9.77-32	7.82-37	9.38-37	9.40-37	-5.24-36									
6	1.76-31	1.59-36	2.50-36	4.90-36										
5	3.76-31	4.18-36	1.10-35											
4	1.12-30	1.96-35												
3	8.15-30													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	-1.73-40	2.36-38	5.35-38	9.06-38	1.36-37	1.93-37	2.62-37	3.45-37	4.47-37	5.73-37	7.27-37	9.17-37	1.15-36	1.45-36
45	-4.86-39	2.99-38	7.48-38	1.32-37	2.04-37	2.97-37	4.12-37	5.57-37	7.40-37	9.75-37	1.27-36	1.66-36	2.17-36	2.83-36
40	-1.82-38	3.57-38	1.08-37	2.04-37	3.30-37	5.02-37	7.22-37	1.02-36	1.41-36	1.94-36	2.68-36	3.70-36	5.16-36	7.27-36
35	-6.12-38	2.87-38	1.58-37	3.41-37	5.99-37	9.78-37	1.51-36	2.28-36	3.43-36	5.20-36	7.97-36	1.25-35	2.04-35	3.50-35
30	-2.30-37	-7.11-38	1.91-37	6.18-37	1.31-36	2.51-36	4.51-36	8.09-36	1.50-35	2.94-35	6.39-35	1.65-34	5.90-34	4.60-33
29	-3.10-37	-1.32-37	1.75-37	6.97-37	1.59-36	3.21-36	6.10-36	1.17-35	2.36-35	5.23-35	1.37-34	4.96-34	4.00-33	
28	-4.25-37	-2.30-37	1.29-37	7.75-37	1.95-36	4.23-36	8.63-36	1.81-35	4.12-35	1.10-34	4.06-34	3.25-33		
27	-5.92-37	-3.86-37	3.22-38	8.44-37	2.44-36	5.82-36	1.31-35	3.12-35	8.61-35	3.25-34	2.68-33			
26	-8.46-37	-6.44-37	-1.71-37	8.53-37	3.08-36	8.42-36	2.18-35	6.34-35	2.46-34	2.09-33				
25	-1.24-36	-1.08-36	-5.85-37	6.97-37	3.94-36	1.32-35	4.27-35	1.76-34	1.54-33					
24	-1.89-36	-1.88-36	-1.46-36	5.72-38	5.00-36	2.37-35	1.13-34	1.07-33						
23	-3.02-36	-3.41-36	-3.49-36	-2.20-36	5.27-36	5.27-35	6.18-34							
22	-5.11-36	-6.64-36	-8.69-36	-1.06-35	-3.78-36	2.01-34								
21	-9.38-36	-1.44-35	-2.49-35	-5.27-35	-1.64-34									
20	-1.92-35	-3.68-35	-9.43-35	-4.94-34										
19	-4.75-35	-1.32-34	-7.96-34											
18	-1.64-34	-1.05-33												
17	-1.26-33													

HE + TE = 1.00+05 NE = 1.00+12 CASE B NC = 20

TOTAL RC = 2.458-13 4-3 RC = 2.792-14 4-3 EM = 1.183-25 2S RC = 7.384-14 2P RC = 1.720-13

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.13-03	6.55-04	2.81-04	1.46-04	8.50-05	5.39-05	3.62-05	2.55-05	1.87-05	1.41-05	1.09-05	8.55-06	6.85-06	5.58-06
45	2.93-03	8.99-04	3.86-04	2.00-04	1.17-04	7.39-05	4.97-05	3.50-05	2.56-05	1.93-05	1.49-05	1.17-05	9.40-06	7.65-06
40	4.17-03	1.28-03	5.50-04	2.85-04	1.66-04	1.05-04	7.08-05	4.99-05	3.65-05	2.75-05	2.12-05	1.67-05	1.34-05	1.09-05
35	6.24-03	1.91-03	8.22-04	4.26-04	2.48-04	1.57-04	1.06-04	7.45-05	5.44-05	4.10-05	3.16-05	2.49-05	1.99-05	1.62-05
30	9.92-03	3.04-03	1.31-03	6.76-04	3.94-04	2.50-04	1.68-04	1.18-04	8.64-05	6.50-05	5.01-05	3.94-05	3.16-05	2.57-05
29	1.10-02	3.37-03	1.45-03	7.49-04	4.37-04	2.76-04	1.86-04	1.31-04	9.56-05	7.19-05	5.54-05	4.36-05	3.49-05	2.84-05
28	1.22-02	3.74-03	1.61-03	8.32-04	4.85-04	3.07-04	2.07-04	1.45-04	1.06-04	7.99-05	6.16-05	4.84-05	3.88-05	3.15-05
27	1.36-02	4.18-03	1.79-03	9.29-04	5.41-04	3.43-04	2.30-04	1.62-04	1.18-04	8.91-05	6.86-05	5.40-05	4.32-05	3.51-05
26	1.53-02	4.68-03	2.01-03	1.04-03	6.06-04	3.84-04	2.58-04	1.82-04	1.33-04	9.97-05	7.68-05	6.04-05	4.83-05	3.92-05
25	1.72-02	5.27-03	2.26-03	1.17-03	6.82-04	4.32-04	2.90-04	2.04-04	1.49-04	1.12-04	8.63-05	6.79-05	5.43-05	4.40-05
24	1.94-02	5.96-03	2.56-03	1.32-03	7.71-04	4.88-04	3.28-04	2.31-04	1.68-04	1.27-04	9.75-05	7.66-05	6.12-05	4.97-05
23	2.21-02	6.77-03	2.91-03	1.50-03	8.77-04	5.55-04	3.73-04	2.62-04	1.91-04	1.44-04	1.11-04	8.69-05	6.94-05	5.63-05
22	2.53-02	7.74-03	3.32-03	1.72-03	1.00-03	6.34-04	4.26-04	2.99-04	2.18-04	1.64-04	1.26-04	9.91-05	7.91-05	6.40-05
21	2.91-02	8.91-03	3.82-03	1.98-03	1.15-03	7.29-04	4.89-04	3.44-04	2.51-04	1.88-04	1.45-04	1.14-04	9.06-05	7.32-05
20	3.37-02	1.03-02	4.43-03	2.29-03	1.33-03	8.44-04	5.66-04	3.98-04	2.90-04	2.18-04	1.67-04	1.31-04	1.04-04	8.41-05
19	3.93-02	1.21-02	5.17-03	2.67-03	1.56-03	9.84-04	6.60-04	4.64-04	3.38-04	2.53-04	1.94-04	1.52-04	1.21-04	9.70-05
18	4.63-02	1.42-02	6.09-03	3.15-03	1.83-03	1.16-03	7.76-04	5.45-04	3.97-04	2.97-04	2.28-04	1.78-04	1.40-04	1.12-04
17	5.50-02	1.69-02	7.23-03	3.74-03	2.17-03	1.37-03	9.20-04	6.45-04	4.69-04	3.51-04	2.68-04	2.08-04	1.64-04	1.28-04
16	6.61-02	2.02-02	8.68-03	4.48-03	2.61-03	1.64-03	1.10-03	7.72-04	5.60-04	4.18-04	3.18-04	2.45-04	1.89-04	1.40-04
15	8.03-02	2.46-02	1.05-02	5.44-03	3.16-03	1.99-03	1.33-03	9.33-04	6.75-04	5.02-04	3.79-04	2.87-04	2.09-04	
14	9.88-02	3.02-02	1.30-02	6.68-03	3.88-03	2.44-03	1.63-03	1.14-03	8.22-04	6.06-04	4.50-04	3.21-04		
13	1.23-01	3.77-02	1.62-02	8.33-03	4.83-03	3.04-03	2.02-03	1.41-03	1.01-03	7.30-04	5.10-04			
12	1.57-01	4.79-02	2.05-02	1.05-02	6.10-03	3.83-03	2.54-03	1.75-03	1.23-03	8.40-04				
11	2.02-01	6.18-02	2.64-02	1.36-02	7.84-03	4.90-03	3.22-03	2.19-03	1.45-03					
10	2.66-01	8.13-02	3.47-02	1.78-02	1.02-02	6.34-03	4.10-03	2.62-03						
9	3.58-01	1.09-01	4.64-02	2.37-02	1.35-02	8.24-03	5.02-03							
8	4.92-01	1.49-01	6.33-02	3.21-02	1.80-02	1.03-02								
7	7.01-01	2.12-01	8.91-02	4.44-02	2.34-02									
6	1.07+00	3.20-01	1.32-01	6.20-02										
5	1.84+00	5.37-01	2.08-01											
4	3.77+00	1.00+00												
3	1.03+01													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	4.60-06	3.84-06	3.23-06	2.75-06	2.36-06	2.04-06	1.77-06	1.55-06	1.37-06	1.21-06	1.07-06	9.59-07	8.59-07	7.73-07
45	6.30-06	5.26-06	4.43-06	3.77-06	3.23-06	2.79-06	2.43-06	2.12-06	1.87-06	1.65-06	1.47-06	1.31-06	1.17-06	1.06-06
40	8.97-06	7.48-06	6.30-06	5.36-06	4.59-06	3.96-06	3.45-06	3.01-06	2.65-06	2.34-06	2.08-06	1.85-06	1.66-06	1.49-06
35	1.34-05	1.11-05	9.38-06	7.97-06	6.83-06	5.89-06	5.12-06	4.47-06	3.93-06	3.46-06	3.07-06	2.73-06	2.43-06	2.18-06
30	2.11-05	1.76-05	1.48-05	1.26-05	1.07-05	9.26-06	8.02-06	6.98-06	6.11-06	5.35-06	4.70-06	4.11-06	3.55-06	2.89-06
29	2.34-05	1.95-05	1.64-05	1.39-05	1.19-05	1.02-05	8.84-06	7.68-06	6.70-06	5.85-06	5.10-06	4.38-06	3.56-06	
28	2.59-05	2.16-05	1.81-05	1.54-05	1.31-05	1.13-05	9.76-06	8.46-06	7.35-06	6.37-06	5.45-06	4.41-06		
27	2.89-05	2.40-05	2.02-05	1.71-05	1.46-05	1.25-05	1.08-05	9.32-06	8.04-06	6.85-06	5.51-06			
26	3.23-05	2.68-05	2.25-05	1.91-05	1.62-05	1.39-05	1.19-05	1.02-05	8.67-06	6.95-06				
25	3.62-05	3.01-05	2.52-05	2.13-05	1.81-05	1.54-05	1.32-05	1.11-05	8.84-06					
24	4.08-05	3.38-05	2.83-05	2.39-05	2.02-05	1.71-05	1.43-05	1.14-05						
23	4.61-05	3.82-05	3.19-05	2.68-05	2.25-05	1.87-05	1.48-05							
22	5.24-05	4.33-05	3.61-05	3.00-05	2.48-05	1.94-05								
21	5.98-05	4.93-05	4.07-05	3.33-05	2.59-05									
20	6.84-05	5.59-05	4.54-05	3.50-05										
19	7.83-05	6.29-05	4.80-05											
18	8.89-05	6.71-05												
17	9.57-05													

HE + TE = 1.00+05 NE = 1.00+12 CASE B NC = 20

TABLE OF LINE CENTRE OPACITY FACTORS

NU \ NL	2	3	4	5	6	7	8	9	10	11	12	13	14	15
50	2.11-35	5.40-40	-6.19-41	-1.13-39	-3.01-39	-4.90-39	-5.00-39	-2.40-39	2.90-39	1.08-38	2.12-38	3.44-38	5.09-38	7.10-38
45	2.90-35	7.42-40	-8.86-41	-1.58-39	-4.20-39	-6.89-39	-7.13-39	-3.58-39	3.80-39	1.49-38	2.99-38	4.91-38	7.34-38	1.04-37
40	4.13-35	1.06-39	-1.33-40	-2.30-39	-6.14-39	-1.02-38	-1.07-38	-5.71-39	5.05-39	2.16-38	4.42-38	7.40-38	1.12-37	1.61-37
35	6.18-35	1.59-39	-2.15-40	-3.53-39	-9.52-39	-1.60-38	-1.73-38	-9.96-39	6.59-39	3.28-38	6.99-38	1.20-37	1.87-37	2.75-37
30	9.86-35	2.54-39	-3.80-40	-5.87-39	-1.60-38	-2.75-38	-3.08-38	-1.98-38	7.56-39	5.33-38	1.21-37	2.18-37	3.54-37	5.45-37
29	1.09-34	2.81-39	-4.32-40	-6.58-39	-1.80-38	-3.11-38	-3.52-38	-2.33-38	7.37-39	5.92-38	1.37-37	2.50-37	4.12-37	6.42-37
28	1.22-34	3.13-39	-4.95-40	-7.41-39	-2.04-38	-3.54-38	-4.05-38	-2.75-38	6.85-39	6.60-38	1.57-37	2.90-37	4.83-37	7.65-37
27	1.36-34	3.50-39	-5.70-40	-8.38-39	-2.31-38	-4.05-38	-4.69-38	-3.29-38	5.88-39	7.39-38	1.80-37	3.38-37	5.73-37	9.25-37
26	1.52-34	3.93-39	-6.61-40	-9.54-39	-2.65-38	-4.67-38	-5.48-38	-3.97-38	4.18-39	8.29-38	2.08-37	3.99-37	6.90-37	1.14-36
25	1.72-34	4.43-39	-7.72-40	-1.09-38	-3.05-38	-5.43-38	-6.47-38	-4.85-38	1.33-39	9.32-38	2.43-37	4.77-37	8.43-37	1.42-36
24	1.94-34	5.02-39	-9.09-40	-1.26-38	-3.54-38	-6.36-38	-7.72-38	-6.00-38	-3.22-39	1.05-37	2.86-37	5.78-37	1.05-36	1.83-36
23	2.22-34	5.72-39	-1.08-39	-1.47-38	-4.15-38	-7.54-38	-9.31-38	-7.55-38	-1.05-38	1.18-37	3.40-37	7.12-37	1.34-36	2.42-36
22	2.54-34	6.56-39	-1.30-39	-1.72-38	-4.90-38	-9.03-38	-1.14-37	-9.66-38	-2.22-38	1.32-37	4.10-37	8.95-37	1.75-36	3.32-36
21	2.93-34	7.58-39	-1.57-39	-2.04-38	-5.86-38	-1.10-37	-1.42-37	-1.26-37	-4.11-38	1.46-37	5.01-37	1.15-36	2.38-36	4.81-36
20	3.40-34	8.82-39	-1.93-39	-2.44-38	-7.10-38	-1.35-37	-1.80-37	-1.68-37	-7.18-38	1.58-37	6.22-37	1.54-36	3.40-36	7.49-36
19	3.98-34	1.04-38	-2.39-39	-2.96-38	-8.73-38	-1.70-37	-2.33-37	-2.31-37	-1.24-37	1.61-37	7.86-37	2.13-36	5.18-36	1.29-35
18	4.71-34	1.23-38	-3.01-39	-3.64-38	-1.09-37	-2.17-37	-3.09-37	-3.28-37	-2.16-37	1.39-37	1.01-36	3.12-36	8.71-36	2.64-35
17	5.62-34	1.47-38	-3.85-39	-4.56-38	-1.39-37	-2.85-37	-4.24-37	-4.85-37	-3.85-37	5.04-38	1.31-36	4.95-36	1.71-35	7.38-35
16	6.79-34	1.78-38	-5.01-39	-5.81-38	-1.81-37	-3.85-37	-6.04-37	-7.52-37	-7.18-37	-2.23-37	1.68-36	8.92-36	4.53-35	4.45-34
15	8.31-34	2.19-38	-6.61-39	-7.57-38	-2.43-37	-5.40-37	-9.03-37	-1.24-36	-1.43-36	-1.06-36	1.83-36	2.02-35	2.50-34	
14	1.03-33	2.75-38	-8.87-39	-1.01-37	-3.38-37	-7.92-37	-1.44-36	-2.23-36	-3.19-36	-4.03-36	-1.11-36	3.12-35		
13	1.31-33	3.52-38	-1.21-38	-1.39-37	-4.89-37	-1.23-36	-2.48-36	-4.52-36	-8.45-36	-1.84-35	-6.08-35			
12	1.69-33	4.62-38	-1.64-38	-1.98-37	-7.45-37	-2.07-36	-4.80-36	-1.10-35	-3.09-35	-1.72-34				
11	2.24-33	6.29-38	-2.20-38	-2.93-37	-1.21-36	-3.86-36	-1.11-35	-3.71-35	-2.47-34					
10	3.06-33	8.97-38	-2.71-38	-4.51-37	-2.15-36	-8.47-36	-3.52-35	-2.73-34						
9	4.35-33	1.36-37	-2.31-38	-7.19-37	-4.32-36	-2.48-35	-2.38-34							
8	6.53-33	2.27-37	2.55-38	-1.15-36	-1.07-35	-1.46-34								
7	1.05-32	4.25-37	2.52-37	-1.71-36	-4.63-35									
6	1.89-32	9.26-37	1.23-36	-5.34-37										
5	4.05-32	2.64-36	8.43-36											
4	1.21-31	1.43-35												
3	8.79-31													

NU \ NL	16	17	18	19	20	21	22	23	24	25	26	27	28	29
50	9.55-38	1.25-37	1.61-37	2.05-37	2.57-37	3.21-37	3.99-37	4.92-37	6.06-37	7.45-37	9.14-37	1.12-36	1.38-36	1.70-36
45	1.41-37	1.87-37	2.44-37	3.15-37	4.02-37	5.11-37	6.46-37	8.15-37	1.03-36	1.30-36	1.64-36	2.07-36	2.64-36	3.39-36
40	2.23-37	3.02-37	4.03-37	5.31-37	6.95-37	9.08-37	1.18-36	1.55-36	2.02-36	2.67-36	3.54-36	4.75-36	6.46-36	8.92-36
35	3.92-37	5.47-37	7.54-37	1.03-36	1.41-36	1.94-36	2.67-36	3.71-36	5.24-36	7.53-36	1.11-35	1.68-35	2.68-35	4.48-35
30	8.16-37	1.20-36	1.77-36	2.60-36	3.88-36	5.90-36	9.21-36	1.49-35	2.56-35	4.72-35	9.75-35	2.42-34	8.40-34	6.40-33
29	9.75-37	1.46-36	2.19-36	3.31-36	5.07-36	7.99-36	1.30-35	2.24-35	4.17-35	8.66-35	2.15-34	7.47-34	5.81-33	
28	1.18-36	1.81-36	2.77-36	4.30-36	6.84-36	1.13-35	1.95-35	3.64-35	7.60-35	1.90-34	6.58-34	5.07-33		
27	1.46-36	2.28-36	3.60-36	5.80-36	9.64-36	1.69-35	3.17-35	6.65-35	1.67-34	5.85-34	4.51-33			
26	1.83-36	2.96-36	4.84-36	8.15-36	1.44-35	2.73-35	5.76-35	1.46-34	5.12-34	4.01-33				
25	2.37-36	3.95-36	6.77-36	1.21-35	2.31-35	4.94-35	1.25-34	4.43-34	3.46-33					
24	3.15-36	5.51-36	1.00-35	1.94-35	4.18-35	1.07-34	3.81-34	3.00-33						
23	4.37-36	8.12-36	1.60-35	3.49-35	9.04-35	3.25-34	2.57-33							
22	6.38-36	1.29-35	2.86-35	7.50-35	2.72-34	2.17-33								
21	1.00-35	2.28-35	6.10-35	2.24-34	1.81-33									
20	1.76-35	4.83-35	1.81-34	1.48-33										
19	3.68-35	1.41-34	1.18-33											
18	1.06-34	9.09-34												
17	6.64-34													