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Erratum

A measurement of D meson production in Z^0 hadronic decays

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1. Page 535, left column, in the Abstract.

The fractional decay widths $\Gamma(Z^0 \to D/\overline{D}X)/\Gamma_h$ are... should be replaced by

The average multiplicities of $D/\bar{D}$ mesons in Z^0 hadronic decays are...

2. Page 542, Table 4, first line.

$\frac{\Gamma(Z^0 \to D/\overline{D}X)B_D}{\Gamma_h}(\%)$

should be replaced by

$< N_{D/\overline{D}} > B_D(\%)$

3. Page 542, right column, about the last lines.

... the fractional decay widths of the Z^0 into D mesons are measured:

$$\Gamma(Z^0 \to D^{*\pm}X)/\Gamma_h = 0.171 \pm 0.012\ (stat)$$
$$\pm 0.011\ (sys.exp) \pm 0.011\ (sys.Br)$$
$$\Gamma(Z^0 \to D^0/\overline{D}^0 X)/\Gamma_h = 0.403 \pm 0.038\ (stat)$$
$$\pm 0.038\ (sys.exp) \pm 0.023\ (sys.Br) \qquad (6)$$
$$\Gamma(Z^0 \to D^{\pm}X)/\Gamma_h = 0.199 \pm 0.019\ (stat)$$
$$\pm 0.014\ (sys.exp) \pm 0.020\ (sys.Br)$$

where the branching ratios...

should be replaced by

... the average multiplicities of $D/\bar{D}$ mesons in Z^0 hadronic decays are measured:

$$< N_{D^{*\pm}} > = 0.171 \pm 0.012\ (stat) \pm 0.011\ (sys.exp)$$
$$\pm 0.011\ (sys.Br)$$
$$< N_{D^0/\overline{D}^0} > = 0.403 \pm 0.038\ (stat)$$
$$\pm 0.038\ (sys.exp) \pm 0.023\ (sys.Br) \qquad (6)$$
$$< N_{D^{\pm}} > = 0.199 \pm 0.019\ (stat)$$
$$\pm 0.014\ (sys.exp) \pm 0.020\ (sys.Br)$$

where the branching ratios...

4. Page 543, left column, before the paragraph starting with "Similar analyses...", add the following.

The above results on the average multiplicities can be used to compute the fractional decay widths of the Z^0 into D mesons for hadronic events, with the following hypotheses:

(a) The fraction of $D\bar{D}$ pairs produced by gluon conversion or by b-hadron decays in $b\bar{b}$ or $c\bar{c}$ events is negligible (D mesons in $b\bar{b}$ or $c\bar{c}$ are thus present only in the fragmentation chain of c and b quarks, and they are 1 or 0 per quark jet);

(b) the production of D mesons is uncorrelated between the 2 quark jets;

(c) the average multiplicity of D mesons in light quark ($u\bar{u}, d\bar{d}$ and $s\bar{s}$) events together is $(5.0 \pm 2.5)\%$ of the average multiplicity in $c\bar{c}$;

(d) the hadronic branching fractions of the Z^0 into $c\bar{c}$ and $b\bar{b}$ follow the Standard Model.

Then the production fractions measured for c and b quarks separately (see Table 4) give the fractional decay widths:

$$\Gamma(Z^0 \to D^{*\pm}X)/\Gamma_h = 0.155 \pm 0.010(stat) \pm 0.013(sys)$$
$$\Gamma(Z^0 \to D^0/\bar{D}^0 X)/\Gamma_h = 0.296 \pm 0.019(stat) \pm 0.021(sys)$$
$$\Gamma(Z^0 \to D^{\pm}X)/\Gamma_h = 0.174 \pm 0.016(stat) \pm 0.018(sys)\,.$$

The systematic error is the sum in quadrature of the experimental systematics, and of the uncertainties due to the D meson branching fractions and to the contribution from light quarks. As a check of the procedure, the fractional decay widths were computed in the simulation, and found to be consistent at the 1% level with the "true" values.

5. Page 543, right column, about Eq. (9).

... the following ratio is found compatible with the expected value of 1 :

$$\frac{\Gamma(Z^0 \to D^0/\overline{D}^0 X) - \Gamma(Z^0 \to D^{\pm}X)}{2\Gamma(Z^0 \to D^{*\pm}X)B_*}$$
$$= 0.88 \pm 0.19\ (stat) \pm 0.17\ (sys.exp) \pm 0.10\ (sys.Br) \qquad (9)$$

where...

should be replaced by

... the following ratio is found compatible with the expected value of 1 :

$$\frac{< N_{D^0/\overline{D}^0} > - < N_{D^{\pm}} >}{2 < N_{D^{*\pm}} > B_*}$$
$$= 0.88 \pm 0.19\ (stat) \pm 0.17\ (sys.exp) \pm 0.10\ (sys.Br) \qquad (9)$$

where...

6. Page 544, right column, bottom.

... and the fractional decay widths of the Z^0 into D mesons are measured to be :

$$\Gamma(Z^0 \to D^{*\pm}X)/\Gamma_h$$
$$= 0.171 \pm 0.012\ (stat) \pm 0.016\ (sys)$$
$$\Gamma(Z^0 \to D^0/\overline{D}^0 X)/\Gamma_h$$
$$= 0.403 \pm 0.038\ (stat) \pm 0.044\ (sys)$$
$$\Gamma(Z^0 \to D^{\pm}X)/\Gamma_h$$
$$= 0.199 \pm 0.019\ (stat) \pm 0.024\ (sys)$$

where...

should be replaced by

... and the average multiplicities of $D/\bar{D}$ mesons in Z^0 hadronic decays are measured to be :

$$< N_{D^{*\pm}} > = 0.171 \pm 0.012\ (stat) \pm 0.016\ (sys)$$
$$< N_{D^0/\overline{D}^0} > = 0.403 \pm 0.038\ (stat) \pm 0.044\ (sys)$$
$$< N_{D^{\pm}} > = 0.199 \pm 0.019\ (stat) \pm 0.024\ (sys)$$

where ... .