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**Creation, destruction, and transfer of atomic multipole moments by electron scattering: Quantum mechanical treatment**[1] DMITRY FURSA, IGOR BRAY, Curtin University, GEORGE CSANAK, DAVID KILCREASE, Los Alamos National Laboratory — The rates for the creation, destruction, and transfer of atomic multipole moments by heavy-particle scattering have been studied for many years using semiclassical scattering theory along with the straight-line trajectory assumption for the scattering particle and using the multitrajectory semiclassical approximation. With the advent of plasma polarization spectroscopy the same rate-coefficients became of interest for electronic collisions also in order to model the anisotropic plasmas. In this work we give general definitions for both elastic and inelastic scattering for the creation, destruction, and transfer cross sections of atomic multipole moments via the use of pure quantum-mechanical methods with due consideration for electron-exchange and for semi-relativistic effects. In order to illustrate the order of magnitude, the sign, and the energy-dependence of these cross sections we have calculated them for electron scattering from hydrogen and barium atoms using the Convergent Close-Coupling (CCC) method.

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Dmitry Fursa
Curtin University

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