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Robust Method for Evaluating Ionization, Charge Exchange and Stripping Cross Sections in Atom-Ion Collisions[1] THOMAS BENDER, IGOR D. KAGANOVICH, RONALD C. DAVIDSON, Plasma Physics Laboratory, Princeton University — Ion-atom charge-changing cross sections are needed in many applications employing the propagation of fast ions through matter. A hybrid method has been developed for calculation of the charge-changing cross sections of ions or atoms by fast ions by combining the quasi-classical approach and the Born approximation of quantum mechanics in the regions of impact parameters in which they are valid, and summing the results to obtain the total cross section [1,2]. As a result, typical computations take only few minutes. This has been tested by comparison with available experimental data and full quantum mechanical calculations. A new scaling formula for the ionization and stripping cross section of atoms and ions by fully stripped projectiles has also been developed [1].

[1] I. D. Kaganovich, E. A. Startsev and R. C. Davidson, "Formulary and scaling cross sections for ion-atom impact ionization," http://arxive.org/abs/physics/0407140.
[2] Igor D. Kaganovich, et. al., Nucl. Instr. and Methods A **544**, 91 (2005).

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Igor Kaganovich
Princeton University

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