

Abstract for an Invited Paper
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Calculation of Atomic Data for Plasma Applications¹

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Accurate and complete datasets for atomic structure and collision parameters are important for many applications in plasma physics, in particular the modeling and diagnostic of discharges. In recent years, we have developed a general computer code [1], based on the close-coupling expansion, that allows for the calculations of such data both for the target structure (energy levels and oscillator strengths) and electron collisions with atoms and ions. The general idea behind such calculations will be discussed, as well as the expected accuracy of the results, current limitations of theory, recent developments including a fully relativistic version [2], and planned extensions for the future. The method will be illustrated with oscillator strengths and electron collision cross sections for the noble gases He-Xe, alkali metals such as a Na and Cs, ions such as FeII, and very heavy targets such as Au and Hg.

[1] O. Zatsarinny, *Comp. Phys. Commun.* **174** (2006) 273.

[2] O. Zatsarinny and K. Bartschat, *Phys. Rev. A* **77** (2008) 062701.

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