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Electron Impact Ionization of Noble Gas Atoms[1] RADU CAMPEANU, York University — Electron impact single ionization of light noble gas atoms remains a formidable theoretical and computational challenge. Most experiments measuring total ionization cross sections are in agreement with each other, but on the theory side work is still needed for atoms heavier than helium. Distorted wave calculations, distorted-wave-R-matrix hybrid models, time-dependent close coupling calculations and coupled-channel-optical calculations produced total ionization cross sections which are in general significantly higher than the experimental data. Recent theoretical work on positron impact ionization of atoms and molecules was based on the use of several simple distorted-wave models. In these models the initial state of the atoms were represented in the Hartree-Fock approximation, while the incident and scattered positron and the ejected electron were described in a number of ways which tried to reproduce the pre and post-collision effects. We found that the inclusion in the final state representation of the electrostatic interaction between the ejected electron and scattered positron (model CPE4) produced good agreement with experiment for hydrogen and all the noble gases. In this paper we examine the possibility of employing electron impact ionization distorted-wave models similar to those successfully used in the positron impact ionization case. We find that when combined with the 'maximum interference' model, these models produce good agreement with the experiments.

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