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Electron-Impact Single Ionization of Mg and Al^{+1} J.A. LUDLOW, C.P. BALLANCE, S.D. LOCH, M.S. PINDZOLA, Auburn University, D.C. GRIFFIN, Rollins College — Electron-impact ionization of atoms and ions is a subject of continuing interest. The development of non-perturbative theoretical methods, such as TDCC, RMPS, and CCC, has enabled the benchmarking of experimental ionization data for many systems and has shown that perturbative distorted-wave methods are generally applicable when the ion is more than a few times ionized (see Griffin and Pindzola, Adv. At. Mol. Opt. Phys. **54**, 203 (2006)). For near neutrals, distorted-wave methods perform poorly. The good agreement with distorted-wave theory shown by the available experimental data for Mg and Al^+ is, therefore, surprising and has prompted new TDCC and RMPS calculations to be carried out for electron-impact ionization of ground state Mg and Al^+. We find that the available experimental single ionization cross sections for Mg and Al^+ lie substantially above the new theoretical cross sections. Furthermore, in the collisional ionization region near the ionization threshold, the Maxwellian-averaged ionization rates for the available experimental results are found to be as much as three times larger than the new theoretical results.

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