

Abstract Submitted
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B-spline R-matrix with pseudostates calculations for electron-impact excitation and ionization of magnesium.¹ OLEG ZATSARINNY, KLAUS BARTSCHAT, Drake University — The B-spline R-matrix with Pseudo-States method [1,2] was employed to treat electron collisions with magnesium atoms. Predictions for elastic scattering, excitation, ionization, and ionization-excitation were obtained for all transitions between the lowest 25 states of Mg in the energy range from threshold to 100 eV. The accuracy of the results was checked by comparing with available experimental data and with results obtained in different approximations with increasing number of coupled states. The largest scattering model included 716 coupled states, most of which were pseudo-states that simulate the effect of the high-lying Rydberg continuum and, most importantly, the ionization continuum on the results for transitions between the discrete states of interest. Similar to our work on e-Be collisions [3], this effect is particularly strong at “intermediate” incident energies of a few times the ionization threshold. The dataset generated from the largest model is estimated to be accurate to within a few percent for the cross sections of relevance for plasma modelling. [1] O. Zatsarinny, *Comp. Phys. Commun.* **174** (2006) 273. [2] O. Zatsarinny and K. Bartschat, *J. Phys. B* **46** (2013) 112001. [3] D. V. Fursa and I. Bray, *J. Phys. B* **49** (2016) 235701.

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