

Abstract Submitted
for the GEC14 Meeting of
The American Physical Society

Calculation of the polarization fraction and electron-impact excitation cross section for the $\text{Cd}^+(5p)^2P_{3/2}$ state¹ CHRISTOPHER J. BOSTOCK, DMITRY V. FURSA, IGOR BRAY, Curtin University, KLAUS BARTSCHAT, Drake University — We present fully relativistic convergent close-coupling and semirelativistic Breit-Pauli R -matrix calculations of the integrated cross section and the polarization fraction for electron-impact excitation of the $(5s)^2S_{1/2} \rightarrow (5p)^2P_{3/2}$ transition in Cd^+ . Above 30 eV, the polarization fraction results are in agreement with earlier RDW calculations [1], but in disagreement with measurements [2], particularly above 60 eV. Cascade contributions and hyperfine depolarization are found to have a negligible affect on the polarization fraction but have a significant effect on the predicted cross section. We also find that the cross section over the entire energy range scales in proportion to the optical oscillator strength of the target model. This is an important generalization of Kim's f -scaling idea [3], since it does not require an ad-hoc shift of plane-wave Born results in the intermediate energy regime.

[1] Sharma *et al.*, Phys. Rev. A **83** (2011) 062701.

[2] Goto *et al.*, Phys. Rev. A **27** (1983) 1844.

[3] Kim *et al.*, Phys. Rev. A **64** (2001) 032713.

¹Work supported by the Australian Research Council and the United States National Science Foundation.

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Date submitted: 06 Jun 2014

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