

Abstract Submitted
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B-Spline R-Matrix with Pseudo-States Treatment of Electron Collisions with Argon¹ OLEG ZATSARINNY, KLAUS BARTSCHAT, Drake University — We have further developed the *B*-Spline *R*-matrix (BSR) code [1] to allow for a large number of pseudo-states in the close-coupling expansion. In the present work, the BSRMPS approach [2] was employed to perform semi-relativistic (Breit-Pauli) close-coupling calculations for elastic scattering, excitation, and ionization of argon from both the ground state and the metastable excited states. Coupling to the ionization continuum through the pseudo-states is important for low-energy elastic scattering (to represent polarizability effects), for excitation in the “intermediate” energy regime of about 1-3 times the ionization potential, and to allow for the calculation of ionization processes by transforming the results obtained for excitation of the positive-energy pseudo-states. The current results represent a significant extension of our earlier near-threshold work [3].

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

[2] O. Zatsarinny and K. Bartschat, *Phys. Rev. Lett.* **107** (2011) 023203.

[3] O. Zatsarinny and K. Bartschat, *J. Phys. B* **37** (2004) 4693.

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