

Abstract Submitted  
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**Fully Nonperturbative Treatment of Ionization and Ionization with Excitation of Noble Gases**<sup>1</sup> OLEG ZATSARINNY, KLAUS BARTSCHAT, Drake University — We have extended the B-spline R-matrix (BSR) method [1] to include a large number of pseudo-states. These pseudo-states are not only important for the accurate treatment of electron-impact excitation processes at intermediate energies, but they also allow for the calculation of ionization processes, using the same basic ideas as in the convergent close-coupling and standard R-matrix with pseudo-states (RMPS) approaches [2,3]. In addition to total cross sections, our general and flexible BSRMPS method yields excellent agreement for the highly correlated ionization with excitation process in helium [4]. Calculations for the more complex Ne and Ar targets will be shown at the conference and compared with recent experimental data [5].

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

[5] X. Ren *et al.*, *Phys. Rev. A* **83** (2011) 052714.

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