Nonperturbative Treatment of Electron-Impact Ionization of Ar(3p)[1] KLAUS BARTSCHAT, OLEG ZATSARINNY, Drake University — We present triple-differential cross sections for electron-impact ionization of a $3p$ electron in Ar. Results from a fully nonperturbative close-coupling formalism using our B-Spline R-matrix with Pseudo-States (BSRMPS) approach [1] are compared with those from a hybrid distorted-wave plus R-matrix expansion [2] as well as recent experimental data [3]. We find overall good agreement between the two sets of entirely independent theoretical predictions, but serious discrepancies with the published experimental data. A detailed investigation of the dependence of the results on the fixed detection angle of the "scattered projectile", i.e., the faster of the two outgoing electrons, suggests that obtaining reliable results, both experimentally and theoretically, is highly challenging in the regime where the largest discrepancies occur. Consequently, care should be taken before much weight is put on the remaining deviations between experiment and theory. Further independent tests seem highly desirable.

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[3] X. Ren, A. Senftleben, T. Pflüger, A. Dorn, K. Bartschat, and J. Ullrich, Phys. Rev. A **83** (2011) 052714.

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