Abstract Submitted
for the GEC18 Meeting of
The American Physical Society

Cross Sections and Spin Asymmetries for Electron Collisions with Lead Atoms[1] DMITRY FURSA, MATTHEW VAN ECK, IGOR BRAY, Curtin University, OLEG ZATSARINNY, KLAUS BARTSCHAT, Drake University — We present integrated and angle-differential cross sections as well as spin asymmetries for elastic and inelastic electron collisions with lead atoms. The results were obtained using the fully relativistic convergent close-coupling (RCCC) [1] and the Dirac B-spline R-matrix (DBSR) [2] methods. They will be compared with experimental data and predictions from previous calculations. In particular, we find substantial discrepancies regarding the normalization of the experimental data at a number of energies for elastic and excitation cross sections. The spin asymmetries for the optically forbidden inelastic transitions from the $(6p^2)^3P_0$ ground state to other states of the $6p^2$ manifold, measured by Geesmann *et al.* [3], are known to be very challenging for theory [4]. We analyze the sensitivity of the predictions to the quality of the target description as well as the number of channels included in the close-coupling expansion. [1] D. V. Fursa and I. Bray, Phys. Rev. Lett. **100** (2008) 113201. [2] O. Zatsarinny and K. Bartschat, Phys. Rev. A **77** (2008) 062701. [3] H. Geesmann, M. Bartsch, G. F. Hanne, and J. Kessler, J. Phys. B **24** (1991) 2817. [4] O. Zatsarinny, Y. Wang, and K. Bartschat, J. Phys. B **46** (2013) 035202.

[1]This work was supported by Curtin University, the Australian Research Council, the Pawsey Supercomputing Centre, the United States Air Force Office of Scientific Research, Drake University, and the United States National Science Foundation.

Dmitry Fursa
Curtin Univ of Technology

Date submitted: 21 Jun 2018 Electronic form version 1.4