Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Electron-impact ionization of Al^{2+} and Al[1] DI WU, S.D. LOCH, C.P. BALLANCE, SH.A. ABDEL-NABY, M.S. PINDZOLA, Department of Physics, Auburn University, Auburn, Alabama, 36849 — Electron-impact ionization cross sections are calculated for Al^{2+} and Al. The non-perturbative R-Matrix with PseudoStates (RMPS) method was used to calculate the direct ionization of the 3s and 2p subshells and the indirect ionization of the 2p subshell for Al^{2+} in a single, comprehensive calculation. This model agrees well with the experimental measurement of Thomason and Peart [1]. For Al, the RMPS and time-dependent close coupling methods are used to calculate cross sections for incident energies ranging from 5 to 30 eV. The non-perturbative close-coupling methods are found to be substantially lower than the perturbative distorted-wave cross sections due to electron correlation effects in both the direct ionization and indirect excitation-autoioniozation contributions. In addition, the close-coupling cross sections are found to be in good agreement with experiment [2].

[1] J. W. Thomason and B. Peart J Phys B **31** L 201 (1998)
[2] R. S. Freund et al Phys. Rev. A **41** 3575 (1990)

[1]This work was supported in part through grants from the U S Department of Energy and NASA. The computational work was caried out at NERSC, Oakland, California.

Di Wu
Department of Physics, Auburn University, Auburn, Alabama, 36849

Date submitted: 24 Jan 2012 Electronic form version 1.4