Abstract Submitted
for the GEC13 Meeting of
The American Physical Society

Angular distributions for electron-impact ionization of Na and Mg G.S.J. ARMSTRONG, J. COLGAN, Theoretical Division, Los Alamos National Laboratory, K.L. NIXON, A.J. MURRAY, University of Manchester, M.S. PINDZOLA, Department of Physics, Auburn University — We present angular distributions for electron-impact single ionization of sodium and magnesium at intermediate electron impact energies. In this work, the time-dependent close-coupling (TDCC) method is used to solve the two-electron time-dependent Schrödinger equation in full dimensionality. The ionization process is treated as a two-active-electron process, where the two outgoing electrons move in the field of the frozen singly-charged ion. We compare calculated angular distributions with measurements taken over a range of intermediate electron impact energies, and in both coplanar symmetric and asymmetric geometries. Several new features are incorporated into the present TDCC approach, including a core orthogonalization at each time step to avoid unphysical de-excitation of the active electrons, an implicit time propagator, and a variable radial mesh. The latter is required to map out the inner atomic orbitals accurately, and the use of an implicit time propagator enables reasonably large time steps to be used.

G.S.J. Armstrong
Theoretical Division, Los Alamos National Laboratory

Date submitted: 08 Jul 2013 Electronic form version 1.4