Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Double photoionization of doubly-excited lithium G. ARMSTRONG, Theoretical Division, Los Alamos National Laboratory, M.S. PINDZOLA, Department of Physics, Auburn University, A. KHEIFETS, Research School of Physical Sciences, Australian National University, M. SCHURICKE, G. VEERAVALLI, CH. DORNES, G. ZHU, K. JOACHIMSMEYER, R. TREUSCH, A. DORN, Max Planck Institute for Nuclear Physics, Heidelberg, J. COLGAN, Theoretical Division, Los Alamos National Laboratory — We present triple differential cross sections and recoil ion momentum distributions for double photoionization of the 1s2s2p state of lithium. Double ionization of lithium may be treated as a two-active-electron process, where the "active" 2s and 2p electrons move in the field of the "frozen-core" Li^{2+} 1s state.The time-dependent close-coupling (TDCC) method is used to solve the two-electron time-dependent Schrödinger equation in full dimensionality. This work is motivated by recent FLASH experiments, which have obtained recoil-ion momentum distributions at a photon energy of 59 eV, where the 1s2s2p state is first reached via a 1s-2p photoexcitation from the initial ground state, and may then be doubly-ionized after the absorption of a second photon. The TDCC calculations in this work treat the subsequent photoionization of this doubly-excited state. The results are compared to those obtained by the convergent close-coupling method and to measurement, and provide a first comparison between theory and experiment in this fundamental few-photon few-body problem.

Gregory Armstrong
Theoretical Division, Los Alamos National Laboratory

Date submitted: 31 Jan 2012 Electronic form version 1.4