

Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Resonances in Valence Photodetachment of Li- below the Opening of the K-shell¹ THOMAS GORCZYCA, Western Michigan University, STEVEN MANSON, Georgia State University — Calculations of the photodetachment cross sections for the valence $2s^2$ shell of Li^- have been performed using the Belfast R-matrix code (Berrington, et al. Computer Physics Communications, 1995). Both single-electron detachment and detachment-plus-excitation channels are included; specifically, channels leaving the Li atom in the $1s^2 2s$ and the $1s^2 2p$ states are included. A single strong resonance is predicted just below the opening of the K-shell threshold and is a $1s \rightarrow 2p$ resonance leading to a $1s 2s^2 2p$ resonance state. This resonance decays to both the $1s^2 2s$ and the $1s^2 2p$ states of neutral Li, and it is found that it appears most strongly (by and order of magnitude or so) in the detachment-plus-excitation channel leaving the atom in the excited $1s^2 2p$ of Li. This is explained in terms of the structure of the $1s 2s^2 2p$ resonance state in which the interaction of the two 2s electrons is much larger than the interaction between the 2s and 2p electrons.

¹Work supported by NASA (TWG) and DOE, Office of Science (STM).

Thomas Gorczyca
Western Michigan University

Date submitted: 30 Jan 2020

Electronic form version 1.4