Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Low-energy outer-shell photodetachment of the negative ion of boron.[1] KEDONG WANG, Henan Normal University, OLEG ZATSARINNY, KLAUS BARTSCHAT, Drake University — The photodetachment of the negative ion of boron, $B^-(2s^22p^2)^3P$, was investigated by employing the B-spline R-matrix method [1] for photon energies ranging from threshold to 12 eV [2]. A multi-configuration Hartree-Fock method with nonorthogonal, term-dependent orbitals was used to generate accurate initial bound-state and final continuum-state wave-functions. The close-coupling expansion included all principal scattering channels for photodetachment from both the 2p and 2s orbitals. The resulting equation were solved using a parallelized version of the BSR computer code [3]. The calculated photodetachment cross sections are in good agreement with the available experimental data. Several prominent resonance features are predicted, thereby providing new challenges in the study of this highly correlated process. To classify the resonance structure, both the partial cross sections and the main contributions of the individual scattering channels are discussed.

[1] O. Zatsarinny and K. Bartschat, J. Phys. B 46 (2013) 112001.
[2] K. Wang, O. Zatsarinny, and K. Bartschat, EPJD (2016), in press.
[3] O. Zatsarinny, Comp. Phys. Commun. 174 (2006) 272.

[1]Work supported by the China Scholarship Council and the United States National Science Foundation under grants PHY-1403245 and PHY-1520970, and by the XSEDE allocation PHY-090031.

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Date submitted: 28 Jan 2016 Electronic form version 1.4