Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

K-shell Photodetachment of C_n^- Anions[1] SAMANTHA FONSECA DOS SANTOS, NICOLAS DOUGUET, Drake University, A. E. OREL, UC Davis, T. N. RESCIGNO, LBNL — The cross section for inner-shell ionization of the C^- anion is known to be characterized by a single, prominent 1s $\rightarrow$ kp shape resonance just above the K-edge.[2] More recently, Berrah and coworkers [3] have found similar behavior in the heavier carbon anion chains C_n^-, $n = 2, 3, ...8$, but with the added feature that in the longer chains the single peak seen in C^- inner-shell photodetachment splits into multiple peaks, depending on the length of the chain. To understand this finding, we have undertaken a theoretical study of inner-shell photodetachment of the molecular anions using the complex Kohn variational method. Our preliminary results for photodetachment of C_2^- and C_3^- are found to be in good agreement with experiment and exhibit both bound resonances below threshold and shape resonances above the K-edge. We will also discuss the basic physical mechanism underlying the splitting of the observed shape resonances in these systems.

[1]Work supported by USDOE, OBES Chemical Sciences, Geosciences, and Biosciences Division
[2]C. W. Walter *et al.*, Phys. Rev. A 73, 062702 (2006)
[3]R. Bilodeau *et al.*, meetings.aps.org/link/BAPS.2015.DAMOP.K1.140

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Date submitted: 26 Jan 2017 Electronic form version 1.4