

Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Exploring strong-field isomerization and dissociation of acetylene anion and cation targets¹ BETHANY JOCHIM, BEN BERRY, T. SEVERT, PEYMAN FEIZOLLAH, M. ZOHRABI, K. J. BETSCH, KANAKA RAJU P., K. D. CARNES, I. BEN-ITZHAK, J. R. Macdonald Laboratory, Department of Physics, Kansas State University, Manhattan, KS 66506 USA, E. WELLS, Department of Physics, Augustana University, Sioux Falls, SD 57197 USA — Over the past several years, acetylene has generated substantial interest as a prototype system for examining isomerization processes, specifically hydrogen migration. Using coincidence 3D momentum imaging, we investigate intense ultrafast laser-induced isomerization and two-body fragmentation of keV beams of various charge states of acetylene, including $C_2H_2^-$, $C_2H_2^+$, and $C_2H_2^{2+}$. Whereas the vast majority of previous work on strong field isomerization and fragmentation of acetylene has necessarily involved ionization step(s), by focusing on dissociation, we ensure that the dynamics ensue within a single molecular ion species, potentially simplifying interpretation. Also, we find the behavior of the branching ratios of the acetylene ($CH^{q_1}+CH^{q_2}$) and vinylidene ($C^{q_1}+CH_2^{q_2}$) dissociation channels to depend strongly upon the initial ionic species.

¹Supported by the Chemical Sciences, Geosciences, and Biosciences Division, Office of Basic Energy Sciences, Office of Science, U. S. Department of Energy under Award #DE-FG02-86ER13491. EW was also supported by the National Science Foundation.

Bethany Jochim
J. R. Macdonald Laboratory, Kansas State University

Date submitted: 07 Feb 2018

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