

Abstract Submitted
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The dependence on initial configuration of strong field-driven isomerization of neutral and ionic C_2H_2 targets¹ BETHANY JOCHIM, BEN BERRY, T. SEVERT, PEYMAN FEIZOLLAH, M. ZOHRABI, KANAKA RAJU P., K. D. CARNES, I. BEN-ITZHAK, J. R. Macdonald Laboratory, Physics Department, Kansas State University, Manhattan, KS 66506 USA, E. WELLS, Physics Department, Augustana University, Sioux Falls, SD 57197 USA — As a test bed for hydrogen migration, the conversion between the C_2H_2 molecule's acetylene (HCCH) and vinylidene (H_2CC) isomers has been a subject of great interest. We further explore isomerization of this system, examining the ultrafast laser-induced dynamics of $C_2H_2^q$ ion beam targets. These ion beams are generated with various initial configurations, including HCCH, H_2CC , and *cis/trans*. We show that the branching ratio between acetylene-like ($CH^{q_1} + CH^{q_2}$) and vinylidene-like ($C^{q_1} + CH_2^{q_2}$) fragmentation[†], measured using a coincidence 3D momentum imaging technique, exhibits a strong dependence on the target's initial configuration. Specifically, while an HCCH target, such as a $C_2H_2^+$ beam produced from C_2H_2 , undergoes acetylene-like and vinylidene-like breakup at comparable levels, for H_2CC targets, there is a distinct preference for the latter. For example, acetylene breakup is negligible for $C_2H_2^-$.

[†]Includes $CH + CH$ and $C + CH_2$

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