

Abstract Submitted
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Dissociative single ionization of CO^+ molecular ions into $C^{2+} + O$ by intense laser pulses¹ NORA G. JOHNSON, J. MCKENNA, A.M. SAYLER, B. GAIRE, M. ZOHRABI, K.D. CARNES, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Physics Department, Kansas State University — The charge asymmetric dissociative ionization (CADI) of a CO^+ molecular ion beam into $C^{2+} + O$ was studied by 7 and 40 fs intense ($10^{14} W/cm^2$) laser pulses with both linear and circular polarization. Using a three-dimensional coincidence imaging technique, we detected both charged and neutral fragments. The measured kinetic energy release and angular distributions allow us to investigate the pathway leading to this CADI channel. Preliminary analysis suggests that the CO^+ is first excited in the leading edge of the laser pulse and later ionized to the $C^{2+} + O$ dissociative curve. We speculate that the initial stretching allows the molecule to be ionized beyond a curve crossing between the $C^{2+} + O$ and high lying $C^+ + O^+$ potentials, therefore enabling dissociation into the otherwise hard-to-reach CADI channel. This possible pathway and the dependence on intensity, polarization, and pulse duration will be discussed.

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