Abstract Submitted
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Three-body fragmentation of triatomic molecular ions in a strong laser field[1] U. ABLIKIM, M. ZOHRABI, BETHANY JOCHIM, BEN BERRY, K.D. CARNES, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Physics Department, Kansas State University, Manhattan, KS 66506, USA — Coincidence three-dimensional momentum imaging measurements of three-body fragmentation of transient triply-charged CO_2 molecules reveal competing fragmentation paths involving bending, symmetric and asymmetric stretching, as well as the more complex sequential breakup (i.e. one bond at a time) [1,2]. We have extended these studies using a CO_2^+ molecular-ion-beam target, providing similar results for the breakup of the transient $CO_2^{3+} \rightarrow O^+ + C^+ + O^+$. The detection of neutral fragments also enables kinematically complete measurements of the three-body breakup of the transient CO_2^{2+}. Our results, for CO_2^+ in ultrashort ($\sim$26 fs) intense (10^{15} to 10^{16} W/cm^2) laser pulses at 790 nm, suggest significant bending in the $C^+ + O^+ + O^+$ channel as well as sequential breakup. In contrast, sequential breakup is suppressed in the $O^+ + C^+ + O$ and $O^+ + C + O^+$ channels.

[1] N. Neumann *et al.*, Phys Rev. Lett. **104**, 103201 (2010)
[2] Cong Wu *et al.*, Phys Rev. Lett. **110**, 103601 (2013)

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Utuq Ablikim
J.R. Macdonald Laboratory, Physics Department,
Kansas State University, Manhattan, KS 66506, USA

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