Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Sequential three-body breakup of a CO_2^+ beam[1] JYOTI RAJPUT, U. ABLIKIM, M. ZOHRABI, BETHANY JOCHIM, BEN BERRY, K. D. CARNES, B. D. ESRY, I. BEN-ITZHAK, J. R. Macdonald Laboratory, Department of Physics, Kansas State University, Manhattan, KS 66506, USA — The dissociative double ionization of a CO_2^+ beam leading to the three-body fragmentation channel $C^+ + O^+ + O^+$ can have its origin in either a sequential or concerted process. In case of the sequential mechanism, the first step is a two-body breakup into $CO^{2+} + O^+$, followed by a second step wherein CO^{2+} further fragments into $C^+ + O^+$. The rotation of the CO^{2+} formed during the first step [1] has been used to discriminate between the sequential and non-sequential mechanisms in experiments which employ multi-coincidence momentum imaging techniques for detecting recoil fragments [2,3]. We propose a novel way to look at this discriminating feature in terms of the angle of rotation of the CO^{2+} intermediate. We will also discuss the implications on the measured momentum distribution of detecting indistinguishable fragments in a coincidence measurement. [1] E. Krishnakumar *et al.* ,Phys. Rev. A **44**, R4098 (1991). [2] N. Neumann *et al.* ,Phys. Rev. Lett. **104**, 103201 (2010). [3] C. Wu *et al.* ,Phys. Rev. Lett. **110**, 103601 (2013).

[1]This work was supported by the Chemical Sciences, Geosciences, and Biosciences Division, Office of Basic Energy Sciences, Office of Science, U.S. Department of Energy. BJ was also supported by DOE-SCGF (DE-AC05-06OR23100).

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Date submitted: 06 Feb 2016 Electronic form version 1.4