

Abstract Submitted  
for the DAMOP20 Meeting of  
The American Physical Society

**Distinguishing geometrical conformers using Coulomb Explosion Imaging**<sup>1</sup> SHASHANK PATHAK, JOHANNES BUERGER, XIANG LI, JAN TROSS, J.R. Macdonald Lab, Kansas State University, RENE BILODEAU, Department of Physics, University of Connecticut and Advanced Light Source, Berkeley, RAZIB OBAID, BRANDIN DAVIS, CARLOS TRALLERO, NORA BERRAH, Department of Physics, University of Connecticut, DANIEL ROLLES, J.R. Macdonald Lab, Kansas State University — We report the results of an experimental study on distinguishing molecular conformers using coincident ion momentum imaging. This work extends our earlier study on identifying *cis* and *trans* isomers of 1,2-dibromoethene ( $C_2H_2Br_2$ ) using Coulomb explosion imaging (CEI). The experiment was performed on 1,2-dibromoethane ( $C_2H_4Br_2$ ) using 140 eV photons at the Advanced Light Source (ALS). Our results suggest that CEI can distinguish between *anti* and *gauche* conformational isomers, which are only distinguished by rotation around single bond. Moreover, we can observe a change in the ratio between *anti* and *gauche* conformers as a function of temperature. The observed breakup patterns show similarities to the related *cis-trans* isomers but indicate a higher fraction of sequential breakup.

<sup>1</sup>Supported by the U.S. Department of Energy, Office of Science, Office of Basic Energy Science, Chemical Science, Geosciences, and Bio-Science division, under grant no. DE-FG02-86ER13491

Shashank Pathak  
Kansas State Univ

Date submitted: 31 Jan 2020

Electronic form version 1.4