Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

X-ray and Laser-Induced Fragmentation of 2,6- and 3,5-difluroiodobenzene[1] UTUQ ABLIKIM, FARZANEH ZIAEE, RAJESH KUSHWAHANA, ARTEM RUDENKO, DANIEL ROLLES, J. R. Macdonald Laboratory, Department of Physics, Kansas State University, Manhattan, KS, CEDRIC BOMME, EVGENY SAVELYEV, Deutsches Elektronen-Synchrotron (DESY), Hamburg, Germany, HUI XIONG, NORA BERRAH, Department of Physics, University of Connecticut, Storrs,CT, TIMUR OSIPOV, SLAC National Accelerator Laboratory, Menlo Park, CA — Studying the intramolecular dynamics of complex (bio-) molecules is challenging both theoretically and experimentally. These large molecules typically exhibit multiple structural isomers, which are distinct species with different physical and chemical properties. We carried out coincidence momentum imaging experiments on gas-phase 2,6- and 3,5-difluroiodobenzene isomers, using both soft X-rays and ultrafast lasers. Using the momentum correlation between iodine and fluorine cations in three-fold coincidence channels, we can distinguish the two isomers experimentally. We also find that the majority of the many-body fragmentations happen in a two-step process, where the iodine-carbon bond is broken first and the second-step Coulomb explosion occurs when the metastable $C_6H_3F_2^{++}$ dication fragments into smaller ionic species.

[1]Supported by DOE Award Number DE-FG02-86ER13491(Kansas group), Award Number DE-SC0012376 (U Conn group). D.R. acknowledges Helmholtz Young Investigator program from DESY, U.A. acknowledges Advanced Light Soure Doctoral fellowship from LBNL

Utuq Ablikim
Kansas State University; Lawrence Berkeley National Lab

Date submitted: 01 Feb 2017 Electronic form version 1.4