Abstract Submitted
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Separation of *cis* and *trans* geometric isomers by Coulomb explosion imaging[1] UTUQ ABLIKIM, B. KADERIYA, V. KUMARAPAN, A. RUDENKO, D. ROLLES, J. R. Macdonald Laboratory, Physics. Dept, Kansas State University, C. BOMME, E. SAVELYEV, Deutsches Elektronen-Synchrotron (DESY), H. XIONG, N. BERRAH, Dept of Physics, University of Connecticut, D. KILCOYNE, Advanced Light Source, Lawrence Berkeley National Laboratory — Isomers, i.e. molecules with the same chemical formula but different chemical structure, play an important role in many biological processes [1]. Recently, it was shown that it is possible to identify different isomers of a chiral molecule by Coulomb explosion imaging [2]. Here, we show that by imaging the Coulomb explosion of $C_2H_2Br_2$ molecules after inner-shell photoionization, we are able to separate a mixture of *cis* and *trans* structures using the momentum correlation between ionic fragments measured in coincidence. Furthermore, we used this capability to investigate the isomer-selective photoionization and fragmentation dynamics of $C_2H_2Br_2$ after Br (3d) ionization. Coulomb explosion simulation results for momentum correlation as well as kinetic energies match closely the experimental results. [1] B. Levine *et al,* Annu. Rev. Phys. Chem. **58**:613–34 (*2007*) [2] M. Pitzer *et al*, Science **341**, 1096-1100 (2013).

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