Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

Time-resolved imaging of XUV-induced fragmentation dynamics in halomethanes[1] B. KADERIYA, X. LI, D. ROLLES, A. RUDENKO, J. R. Macdonald Laboratory, Department of Physics, Kansas State University, S. MEISTER, G. SCHMID, S. AUGUSTIN, K. SCHNORR, Y. LIU, H. LINDENBLATT, F. TROST, R. MOSHAMMER, Max-Planck-Institut fr Kernphysik, Heidelberg, Germany, M. BRAUNE, Deutsches Elektronen-Synchrotron DESY, Germany — Halomethanes are extensive used as model systems for understanding laser-driven and laser-controlled chemistry in the optical and ultraviolet domain. Here, we extend these studies to photo-fragmentation dynamics of CH_2ICl and CH_3I triggered by femtosecond extreme ultraviolet (XUV) pulses at 24 eV photon energy. We employ a combination of an XUV-pump - XUV-probe arrangement and a dedicated coincident momentum imaging spectrometer installed at the FLASH-II free-electron laser facility. By measuring yields, kinetic energies and angular distribution of ionic fragments resulting from the breakup of doubly- and triply-charged final states as a function of time delay between two XUV pulses, we disentangle different dissociative ionization pathways triggered by the absorption of 24 eV XUV photon(s). For both molecular systems, the results are compared to the outcome of a similar measurement of the molecular fragmentation dynamics driven by intense near-infrared laser pulses with comparable pulse duration.

[1]Supported by the Chemical Sciences, Geosciences, and Biosciences Division, Office of Basic Energy Sciences, Office of Science, U. S. Department of Energy under Award DE-FG02-86ER13491

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Date submitted: 01 Feb 2019 Electronic form version 1.4