Abstract Submitted
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Multiphoton ionization and fragmentation of iodine-containing molecules by femtosecond ultraintense hard X-rays[1] S.J. ROBATJAZI, X. LI, D. ROLLES, A. RUDENKO, Kansas State University, B. ERK, R. BOLL, C. BOMME, E. SAVELYEV, DESY, Hamburg, B. RUDEK, PTB, Braunschweig, L. FOUCAR, MPI for Medical Research, Heidelberg, CH. BOSTEDT, S. SOUTHWORTH, C.S. LEHMANN, B. KRAESSIG, L. YOUNG, Argonne National Laboratory, T. MARCHENKO, M. SIMON, UPMC, Paris, K. UEDA, Tohoku University, Sendai, K.R. FERGUSON, M. BUCHER, T. GORKHOVER, S. CARRON, R. ALONSO-MORI, G. WILLIAMS, S. BOUTET, LCLS, SLAC National Accelerator Laboratory — We present ion charge state distributions and kinetic energy spectra resulting from the breakup of CH_3I and C_6H_5I molecules induced by femtosecond X-ray pulses from the Linac Coherent Light Source (LCLS) at 8.3 keV photon energy. Using a few-hundred nm focus of the LCLS CXI beamline, we reach peak intensities of up to 10^{20} W/cm^2, resulting in stripping of more than 50 electrons per molecule within few tens of fs. We find that in this regime the interplay between multiphoton absorption and subsequent charge rearrangement considerably differs from earlier observations for soft X-rays [1] or for weaker hard X-rays [2]. We discuss the pulse duration dependence of the data, and compare the results for seeded and unseeded LCLS pulses. [1] B. Erk *et al.*, Phys. Rev. Lett. **110**, 053003 (2013). [2] K. Motomura *et al.*, J. Phys. Chem. Lett. **6**, 2994 (2015).

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