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**Channel-resolved photo- and Auger-electron spectroscopy of halogenated hydrocarbons**[1] UTUQ ABLIKIM, B. KADERIYA, V. KUMARAPAN, R. KUSHAWAHA, A. RUDENKO, D. ROLLES, J. R. Macdonald Laboratory, Physics. Dept, Kansas State University, H. XIONG, N. BERRAH, Dept of Physics, University of Connecticut, C. BOMME, E. SAVELYEV, Deutsches Elektronen-Synchrotron (DESY), D. KILCOYNE, Advanced Light Source, LBNL — Inner-shell photoelectron and Auger electron spectra of polyatomic molecules such as halogenated hydrocarbons are typically hard to interpret and assign due to many overlapping states that form broad bands even in high-resolution measurements [1]. With the help of electron-ion-ion coincidence measurements performed using the velocity map imaging technique, we are able to detect high-energy ($\leq$ 150 eV) photo- and Auger electrons in coincidence with two- or many-body ionic fragmentation channels. Such channel-resolved measurements allow disentangling the overlapping electronic structures and help assigning individual components of the electron spectra to specific potential surfaces and final states. In this work, we present measurements on $CH_3I$, $CH_2IBr$, and $CH_2ICl$ molecules in the gas-phase using soft x-ray light provided by the Advanced Light Source at LBNL. [1] D.M.P. Holland *et al.* Chem. Phys. **326**: 535–550 (2006).

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