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XUV Transient Absorption of Strong-Field Ionized Ferrocene
ADAM S. CHATTERLEY, FLORIAN LACKNER, DANIEL M. NEUMARK, STEPHEN R. LEONE, OLIVER GESSNER, Lawrence Berkeley National Lab —
Femtosecond extreme ultraviolet (XUV) transient absorption experiments are underway to study the dynamics of ferrocene following strong field ionization. Ferrocene is a textbook organometallic compound, composed of an iron atom sandwiched between two aromatic organic rings. An intense infrared (IR, 790 nm) pump pulse is used to ionize the ferrocene molecules. Femtosecond XUV pulses, created by high harmonic generation (HHG) are used to probe the induced dynamics. Iron 3p innershell to valence transitions (M edge, 50 eV $<h\nu<$70 eV) are expected to be sensitive to the electronic structure in the vicinity of the iron atom. Hence, transient XUV absorption spectra will probe the strong-field induced molecular dynamics from the perspective of the metal center. We will induce dissociation dynamics at high field intensities and use lower IR intensities to study dynamics of electronically and/or vibrationally excited ferrocene cations. Preliminary results will be presented, demonstrating current progress of XUV transient absorption experiments on moderately large molecular systems.

Adam Chatterley
Lawrence Berkeley National Lab

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