

X-FAST: A NEW XUV FEMTOSECOND ABSORPTION SPECTROSCOPY TABLETOP INSTRUMENT AT UW-MADISON

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Core-level spectroscopies enable element specific measurements of electronic and vibrational dynamics on the femtosecond timescale. Advancements in the generation of XUV light through high harmonic generation (HHG) has opened the door to doing such measurements in-house; we are currently in the commissioning phase of the X-FAST instrument at the University of Wisconsin - Madison. Here, we describe the instrument and show the initial capabilities and studies carried out using the X-FAST instrument.

The instrument is comprised of two paths, an optical pump in air and an XUV probe in vacuum. We used this system to carry out two preliminary experiments: a study of the kinetics and dynamics of transition-metal perovskite oxides, and a collection of static transient absorption spectra of a metallic shape-memory alloy, Ni_2MnGa .