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KAMP: a new photoion-photoelectron coincidence setup for time-resolved XUV-IR experiments[1] S. J ROBATJAZI, S. PATHAK, W. L. PEARSON, J. POWELL, KANAKA RAJU P., J. BUERGER, D. ROLLES, A. RUDENKO, Kansas State University — We describe a newly developed Kansas Atomic and Molecular Physics (KAMP) instrument, which combines a femtosecond pump-probe setup employing extreme-ultraviolet (XUV) and near-infrared (NIR) pulses with a double-sided velocity map imaging (VMI) spectrometer for photoion–photoelectron coincidence measurements. The spectrometer equipped with two time- and position-sensitive delay-line detectors is attached to a high-harmonics generation (HHG) setup based on a commercial KM Labs eXtreme Ultraviolet Ultrafast Source. The latter is capable of delivering HHG radiation of less than 30 fs pulse duration in the photon energy range of ˜17 - 100 eV. We present the results of the instrument's commissioning, including ion-electron coincidence spectra from XUV-NIR pump-probe measurements on valence-shell and inner-shell ionization of Xe and Kr atoms, as well as ionization and fragmentation of CO2 molecules. Most of the major setup elements such as the interaction chamber, VMI spectrometer, detectors and a gas target arrangement are compatible with the CAMP and LAMP instruments installed at FLASH and LCLS free-electron laser facilities, respectively, enabling efficient testing of the new equipment components for experiments at these facilities.

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