

Abstract Submitted
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Photoion-photoelectron coincidence measurement on dissociative ionization of CO₂ driven by XUV pump and NIR probe pulses.¹ S. J. ROBATJAZI, S. PATHAK, W. L. PEARSON, J. POWELL, KANAKA RAJU P., J. BUERGER, D. ROLLES, A. RUDENKO, Kansas State University — We present the results of an extreme-ultraviolet (XUV) pump near-infrared (NIR) probe experiment on dissociative ionization of a CO₂ molecule. The molecules are ionized by a train of high harmonics (11th to 19th) of the NIR laser beam at 790 nm, and the ensuing dynamics are probed by the time-delayed NIR pulse. A double-sided velocity map imaging spectrometer equipped with two delay-line detectors is employed to detect photoions and photoelectrons in coincidence. Coincident measurement of the photoelectron energies allows us to separate contributions from higher-order harmonics, and to focus on the dynamics driven only by the 11th and 13th harmonics. We show the yields of CO₂⁺ parent ions as well as CO⁺ and O⁺ fragments resulting from the XUV-NIR dissociative ionization as a function of XUV-NIR delay, and analyze coincident electron spectra for each channel. Filtering on photoelectron energies allows us to disentangle contributions from different excited cationic states, and enables deeper understanding of ultrafast dynamics observed in earlier, non-coincident measurement on CO₂ dissociative ionization by XUV-NIR pump-probe pulses [1]. [1] H. Timmers et al, Phys. Rev. Lett. 113, 113003 (2014).

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