Abstract Submitted
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Strong-field ionization of Xe probed by femtosecond high-order harmonic absorption spectroscopy[1] ZHI-HENG LOH, MUNIRA KHALIL, RAOUL E. CORREA, Department of Chemistry, University of California, Berkeley, CA 94720, ROBIN SANTRA, Argonne National Laboratory, Argonne, IL 60439, STEPHEN R. LEONE, Departments of Chemistry and Physics, University of California, Berkeley, CA 94720 — Recent experiments on strong-field ionization of atoms and ions have led to conflicting conclusions regarding the existence of orbital alignment in the ionized species. Using table-top, femtosecond high-order harmonic absorption spectroscopy, we have measured the alignment of Xe^+ formed via strong-field ionization. High-order harmonics generated by focusing an intense 800 nm pulse into a Ne-filled capillary are spatially overlapped with an optical pump pulse in a sample gas cell before they are spectrally dispersed in an extreme ultraviolet spectrometer. Probing the transition from the $4d$ core level to the $^2P_{3/2}$ state of Xe^+ at 55.4 eV yields a polarization anisotropy of 0.12 ± 0.01, in good agreement with the theoretical value of 0.1. This result suggests that strong-field ionization exclusively populates the $m_J = \pm 1/2$ sub-levels in the Xe^+ $^2P_{3/2}$ state.

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