Triggering coherent electronic hole motion with strong-field pulses

STEFAN PABST, CFEL, DESY and ITAMP, Harvard-Smithsonian CFA, HANS-JAKOB WÖRNER, Laboratorium für Physikalische Chemie, ETH Zürich

— We report about a very effective way to create coherent hole wave packets in atoms and molecules. In xenon, we demonstrate how strong-field pulses can trigger coherent spin-orbit hole motion in the valence 5p shell via tunnel ionization. The degree of coherence between the ionic states $5p_{1/2}^{-1}$ and $5p_{3/2}^{-1}$ can be controlled by the pulse duration and driving wavelength.