Abstract Submitted
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Energy- and angle-resolved non-resonant 2-photon single valence ionization of N_2 using 9.3 eV femtosecond pulses KIRK LARSEN, University of California, Berkeley, ROGER BELLO, ROBERT LUCCHESE, C. WILLIAM MCCURDY, DANIEL SLAUGHTER, THORSTEN WEBER, Lawrence Berkeley National Laboratory — We present an experimental and theoretical study on the photoionization dynamics of non-resonant 2-photon single valence ionization of molecular nitrogen. Using 30 femtosecond 9.3 eV pulses produced via 400 nm driven high harmonic generation and a 3-D momentum imaging spectrometer, we detect the photoelectrons and ions produced from 2-photon ionization in coincidence. Photoionization populates nitrogens $X(^2\Sigma_g^+)$, $A(^2\Pi_u)$ and $B(^2\Sigma_u^+)$ ionic states, where the photoelectron angular distributions of the $X(^2\Sigma_g^+)$ and $A(^2\Pi_u)$ states both vary with changes in electron kinetic energy of only a few hundred meV, which we attribute to 2-electron resonances. These results are compared against time-dependent full ab initio calculations.

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