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XUV Laser Assisted Control of High Harmonic Generation[1]
MICHELLE MILLER, ANDREAS BECKER, JILA and Department of Physics, University of Colorado — We have conducted a theoretical study to investigate control of the high-order harmonic generation (HHG) emitted by a one-electron atomic system by using an XUV laser pulse. In this scheme, a linearly polarized 800 nm three-cycle driving laser field is incident upon a He^+ ion. While initially prepared in the ground state, the electron is promoted to an excited state using a second, linearly polarized XUV laser pulse tuned to resonance with the energy level transition. By selecting the driving laser intensity so that ionization from the ground state is strongly disfavored, we are afforded control over the time of ionization and the initiation of the HHG process. The span of the plateau of the resulting harmonic spectrum is equivalent to that of HHG from an ion prepared in the ground state, but the harmonic emission is stronger in magnitude. Excitation through the tail end of the driving pulse additionally allows control of the location of the cutoff within the spectrum.

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