Abstract Submitted
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Two-Photon Resonant-Single and Double Ionization of Helium by Ultrashort Laser Pulses[1] ALICIA PALACIOS, THOMAS N. RESCIGNO, Lawrence Berkeley National Lab., C. WILLIAM MCCURDY, U. C. Davis and LBNL — Two-photon single and double ionization induced by ultrashort laser pulses in He are explored in accurate time-dependent calculations including a full treatment of electron correlation. Ionization amplitudes and cross sections are extracted from the wave packet using exterior complex scaling. For photon energies above the first ionization threshold, two-photon single ionization is enhanced by core excited resonances, in processes visible with pulses as short as two femtoseconds when the photon frequency is equal to a transition energy in He^+. Subfemtosecond pulses are seen to suppress the two-peak signature of sequential ionization in the energy sharing cross section, mostly due to Fourier broadening. However, triple differential cross sections from subfemtosecond pulses show the evidence of nonsequential ionization competing more strongly with the sequential process. Peaks in the single differential cross section due to sequential ionization via excited intermediate states of the ion are observed to occur at energies displaced by about two eV from the expected values by novel interference effects between continuum channels.

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C. William McCurdy
U. C. Davis and Lawrence Berkeley National Laboratory

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