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Interference between nonsequential and sequential two-photon double ionization in short XUV pulses¹ J. FEIST, R. PAZOUREK, S. NAGELE, E. PERSSON, J. BURGDÖRFER, Institute for Theoretical Physics, Vienna University of Technology, Austria, L.A. COLLINS, Theoretical Division, Los Alamos National Laboratory, USA, B.I. SCHNEIDER, Physics Division, National Science Foundation, USA — We investigate the effects of electron correlation in the two-photon double ionization of helium for ultrashort XUV pulses with durations ranging from a hundred attoseconds to a few femtoseconds. We perform time-dependent *ab initio* calculations of the two-electron Schrödinger equation. For photon energies above 65.4 eV, two-photon double ionization can proceed via two different channels: one where the intermediate state after one-photon absorption is the ground state of the He^+ ion, and another where it is an excited (shake-up) state. The “nonsequential” contribution from the ground state channel can then interfere with the “sequential” contribution from the shake-up channel. The relative strength of these contributions is controlled by the pulse duration. This observation may provide a route toward measuring the pulse duration of FEL pulses.

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Prefer Oral Session

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