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Time Delays in Two-Photon Ionization[1] ANDREAS BECKER, JING SU, JILA and Department of Physics, University of Colorado, Boulder, CO, HONGCHENG NI, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, AGNIESZKA JARON-BECKER, JILA and Department of Physics, University of Colorado, Boulder, CO — We present results of ab-initio numerical simulations of time delays in two-photon ionization of the helium atom using the attosecond streaking technique [1]. The temporal shifts in the streaking traces consist of two contributions, namely, a time delay acquired during the absorption of the two photons from the extreme-ultraviolet field and a time delay accumulated by the photoelectron after photoabsorption [2,3]. In the case of a nonresonant transition, the absorption of the two photons is found to occur without time delay. In contrast, for a resonant transition a substantial absorption time delay is found, which scales linearly with the duration of the ionizing pulse. The latter can be related to the phase acquired during the transition of the electron from the initial ground state to the continuum and the influence of the streaking field on the resonant structure of the atom.

[1] J. Su et al., Phys. Rev. Lett. **113**, 263002 (2014);
[2] J. Su et al., Phys. Rev. A **88**, 023413 (2013);
[3] J. Su et al., Phys. Rev. A **89**, 013404 (2014).

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