Abstract Submitted
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A RABBITT attoclock for the direct measurement of photoionization time delays[1] LUCA ARGENTI, NICOLAS DOUGUET, University of Central Florida, STEFAN DONSA, IVA BREZINOVA, JOACHIM BURGDRFER, Vienna University of Technology — We propose the "RABBITT attoclock", an XUV-pump IR-probe photoionization scheme that employs isolated pairs of counter-rotating consecutive harmonics, such as those produced with bi-circular fields [1-2], in conjunction with angularly resolved detectors. This method differs from Rainbow RABBITT [3] in two major respects: i) it gives direct access to rapidly varying photoemission delays, thus eliminating the interference from the continuum-continuum probe stage, and ii) it does not require any time-delay scan. The scheme is based on the interference between one-photon and two-photon ionization pathways whose phase difference is imprinted in the photoelectron anisotropy. We illustrate the method with *ab initio* simulations [4,5] of the resonant ionization of the helium atom, showing that the angular photoelectron distribution exactly reproduces the rapid excursion of the scattering phase shift near the $(2s2p)^1\mathrm{P}^\mathrm{o}$ resonance. [1] O. Kfir *et al.*, Nat. Photonics **9**, 99 (2015). [2] P.-C. Huang *et al.*, Nat. Photonics **12**, 349 (2018). [3] V. Gruson *et al.*, Science **354**, 734 (2016). [4] L. Argenti *et al.* Phys. Rev. A **87**, 053405 (2013). [5] S. Donsa *et al.* arXiv:1811.09110 [physics.atom-ph].

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