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Ionization modulation from interference of phase-locked ultrafast pulse pairs DAVID FOOTE, KEVIN LEHR, WENDELL HILL, University of Maryland — We have performed two distinct multiphoton ionization experiments of xenon using 800 nm, twin-peaked pulses, each of which were nominally 75 fs in duration. In each experiment, the separation and relative phase of the peaks could be adjusted. In both cases, a 2π-periodic variation of Xe^+ yield was observed as a function of the relative phase. Two different mechanisms that can lead to such a modulation have been considered: optical interference of the two peaks and electron-wavepacket interference between the electrons liberated by each peak, similar to what was observed for single-photon ionization of potassium [1]. To this end, we extended the theory of [1] to the multiphoton case. Details of our experimental results and numerical simulations will be presented along with what these results mean for control experiments. [1] M. Wollenhaupt et al., Phys. Rev. Lett. 89, 173001 (2002).

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