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Coherent control of the photoelectron angular distribution in short-pulse XUV ionization of neon.[1] N. DOUGUET, K. BARTSCHAT, Drake University, A. N. GRUM-GRZHIMAILO, E. V. GRYZLOVA, E. I. STAROSELSKAYA, Moscow State University — Light-induced coherent control of the photoelectron angular distribution (PAD) in neon was recently achieved using the Free-Electron Laser (FEL) at FERMI [1]. To gain a better understanding of these processes, which promise a rich field of possibilities in the control of matter, we investigated two-pathway interferences in the ionization of neon induced by the fundamental and second harmonic of a femtosecond XUV pulse when either $(2p^5 4s)^1P$ [1] or $(2p^5 3s)^1P$ [2] are chosen as intermediate states to enhance the two-photon ionization probability. Using a time-dependent approach supported by a perturbative formalism, we analyze the effects of varying the fundamental frequency, intensity ratio between harmonics, and carrier envelope phase. Our results are compared with new experimental data [3]. We also discuss the additional degree of freedom provided by adding an infrared field [4] and comparing the PADs of the sidebands obtained by time-dependent calculations and the strong-field approximation. [1] K. C. Prince et al., Nature Photon. **10** (2016) 176. [2] N. Douguet et al., Eur. Phys. J. D **71** (2017), in press. [3] G. Sansone et al., private communication (2017). [4] N. Douguet, A. N. Grum-Grzhimailo, and K. Bartschat, Phys. Rev. A **95** (2017) 013407.

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