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Coherent Attosecond Control of Photoelectron Emission[1] BRADY UNZICKER, SPENSER BURROWS, MORGAN TATUM, JOHN VAUGHAN, TREVOR HART, DAVIS ARTHUR, PATRICK STRINGER, GUILLAUME LAURENT, Auburn University — Coherent control of electron dynamics in matter is a growing research field in ultrafast science, which has been mainly driven over the last two decades by major advances in laser technology. Recently, the advent of extreme-ultraviolet (XUV) light pulses in the attosecond time scale (1 as = 10^{-18} s) has opened new avenues for experimentalists to manipulate the electronic dynamics with unprecedented temporal precision. In this work, attosecond pulses with controlled temporal profiles were used to guide the electron emission from an atomic target. Attosecond pulse trains made of odd and even harmonics were used to ionize the target in the presence of a weak IR field. An asymmetric photoelectron emission resulting from the interference between one- and two-photon transitions is produced. We show that the direction of photoemission can be varied along the polarization axis of the driving field by tailoring the spectral components of the attosecond pulse.

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