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Coulomb-Laser Coupling Effects in Attosecond Time-Resolved Photoelectron Spectra[1] CHANG-HUA ZHANG, UWE THUMM, Kansas State University — Photoionization by attosecond (as) extreme ultraviolet pulses into the laser-dressed continuum of the ionized atom is commonly approximated in strong-field approximation, i.e., by neglecting the Coulomb interaction between the emitted photoelectron (PE) and the residual ion [1]. By solving the time-dependent Schödinger (TDSE) equation, we find a temporal shift in the streaked photoemission spectra that is due to the Coulomb-laser coupling in the final-state and reaches in excess of 50 as at small photoelectron kinetic energies. The examination of this shift enables i) the experimental scrutiny of effects that are due to the combined action of Coulomb and laser forces on the PE and ii) tests of theoretical approximations to the exact Coulomb-Volkov state of the PE. Within an eikonal approximation, we derive a simple analytical expression for this coupling effect and assess its accuracy by comparison with full TDSE numerical results.

[1] e.g., Zhang and Thumm, PRL 102, 123601 (2009).
[2] Submitted to PRL.

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Chang-hua Zhang
Kansas State University

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