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Abstract for an Invited Paper
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Irving Langmuir Prize in Chemical Physics Talk: Attosecond Electron Dynamics¹

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Isolated attosecond pulses are produced by the process of high order harmonics, and these pulses are used as a soft X-ray probe in wavelength-dispersed transient absorption. Inner shell core-level spectroscopic transitions are thus used to analyze the chemical and electronic environment of specific atomic states as a function of time following ionization and dissociation. High field ionization processes, using 800 nm pulses, result in spin-orbit electronic state populations, alignment, and electronic wave packet superpositions, all of which are investigated by the spectrally-resolved X-ray probe. By using isolated attosecond pulses as the probe, high field ionization events on a subfemtosecond timescale are investigated. The generality of the transient absorption method for attosecond dynamics is described, as well as the challenges during the pump-probe pulse overlap time period. The results are compared to theoretical calculations by collaborators.

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