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Extraction of Electron Above-Threshold-Ionization Spectra from Core Region of Time-Dependent Wave Packet DMITRY TELNOV, Department of Physics, St. Petersburg State University, Russia, SHIH-I CHU, Department of Chemistry, University of Kansas — We present a new method for accurate calculations of electron energy and angular distributions after above-threshold multiphoton ionization. The procedure does not require propagation of the wave packet at large distances since the electron spectra are extracted from the vicinity of the atomic core. The method is based on the extension of the Kramers–Henneberger picture of the ionization process while the final expressions involve the wave function in the laboratory frame only. The approach is illustrated by a case study of above-threshold ionization of the hydrogen atom subject to intense laser pulses with the wavelength 800 nm. The ejected electron energy and angle distributions have been calculated and analyzed for long (20 optical cycles) as well as short (4 optical cycles) laser pulses. We explore the electron spectra dependence on the duration of the laser pulse and carrier-envelope phase (CEP). In particular, we predict a non-zero CEP-dependent total momentum gained by the electrons as a result of the interaction with the laser pulse.

Shih-I Chu
Department of Chemistry, University of Kansas

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