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Extension of High Harmonic Generation Cutoff via Coherent Control of Intense Few-Cycle Chirped Laser Pulses[1] JUAN J. CARRERA, SHIH-I. CHU, University of Kansas — We present an *ab initio* quantum investigation of the high-order harmonic generation (HHG) cutoff extension using intense few-cycle chirped laser pulses. For few-cycle chirped driving laser pulse, it is shown that significant cutoff extension can be achieved through the optimization of the chirping rate parameters. The HHG power spectrum is calculated by solving accurately and efficiently the time-dependent Schrödinger equation by means of the time-dependent generalized pseudospectral method. The time-frequency characteristics of the HHG power spectrum are analyzed in details by means of the wavelet transform of the time-dependent induced dipole acceleration. In addition, we perform classical trajectory simulation of the strong-field electron dynamics and electron return map. It is found that the quantum and classical results provide complementary and consistent information regarding the underlying mechanisms responsible for the substantial extension of the cutoff region.

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