Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Simulation of carrier-envelope phase effects on polarization gated attosecond spectra ZENGHU CHANG, Kansas State University — Polarization gating of harmonic generation by a laser field with a time dependent ellipticity has been demonstrated as a powerful method to produce single attosecond pulses. A single attosecond in time domain correspond to an extreme ultraviolet (XUV) supercontinuum in the spectrum domain. Previous numerical simulations and experiments show that the attosecond pulses and the corresponding spectra are sensitive to the variation of the carrier-envelope (CE) phase of the laser pulses. In this work, the mechanism of the effects of CE phase on the polarization gating process is investigated. In the simulation, the laser pulses for polarizating gating are obtained by transforming linearly polarized few-cycle pulses with a quartz plate and an achromatic waveplate. The laser pulse can be decomposed into two orthogonally polarized pulses, i.e., a driving pulses and a gating pulse. The CE phase is defined as the phase of the driving field at the time when the ellipticity of combined pulses is zero. We found that when the CE phase changes from zero to Pi, the XUV spectra evolves from a supercontinuum to discrete harmonic peaks and than back to a supercontinuum. The evolution can be understood by the interference of the two attosecond pulses. The amplitudes and spectral phases of two pulses are controlled by the CE phase and the envelope of the driving field.

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Date submitted: 01 Feb 2007 Electronic form version 1.4