Abstract Submitted
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Minimizing the Duration of Isolated Attosecond Pulses[1] DIAN PENG, MATTHIAS FUCHS, ANTHONY F. STARACE, University of Nebraska - Lincoln — We have employed an analytic method of calculating high-order harmonic generation (HHG) by few-cycle pulses to explore how the duration of an isolated attosecond pulse can be minimized by carefully selecting and coherently combining frequencies in the HHG spectra produced by ultrashort driving pulses. One advantage of the analytic method is that it allows very fast calculations even for very long driving wavelengths. In the analytic description, all the short and long trajectory contributions from one laser cycle are encoded into an Airy function. The computation time using this analytic method is negligibly short comparing to solving the time-dependent Schrödinger equation (TDSE). HHG spectra obtained from the analytic method are accurate near the cutoff and compare well with TDSE results over the entire plateau region. Moreover, this analytic method provides clear physical interpretations that we have previously utilized to explore how HHG can be enhanced by time delays[1] or chirps[2] in a two-pulse setup. Using this analytic method, we present attosecond-pulse results obtained by selecting various frequency portions of the HHG spectrum produced by a short driving pulse. [1] D. Peng et al., Phys. Rev. A 95, 033413 (2017). [2] D. Peng et al., Phys. Rev. A 97, 053414 (2018).

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