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Title:Single attosecond pulse from terahertz-assisted high-order harmonic generation
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Abstract:High-order harmonic generation by few-cycle 800 nm laser pulses in neon gas in the presence of a strong terahertz (THz) field is investigated numerically with propagation effects taken into account. Our calculations show that the combination of THz fields with up to 12 fs laser pulses can be an effective gating technique to generate single attosecond pulses. We show that in the presence of the strong THz field only a single attosecond burst can be phase matched, whereas radiation emitted during other half cycles disappears during propagation. The cutoff is extended and a wide supercontinuum appears in the near-field spectra, extending the available spectral width for isolated attosecond pulse generation from 23 to 93 eV. We demonstrate that phase-matching effects are responsible for the generation of isolated attosecond pulses, even in conditions when single-atom response yields an attosecond pulse train.
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