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Title:Quasi-phase-matching high-harmonic radiation using chirped THz pulses
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Abstract:High-order harmonic generation in the presence of a chirped THz pulse is investigated numerically with a complete 3D nonadiabatic model. The assisting THz pulse illuminates the high-order harmonic generation gas cell laterally inducing quasi-phase-matching. We demonstrate that it is possible to compensate the phase mismatch during propagation and extend the macroscopic cutoff of a propagated strong IR pulse to the single-dipole cutoff. We obtain 2 orders of magnitude increase in the harmonic efficiency of cutoff harmonics (≈170 eV) using a THz pulse of constant wavelength, and a further factor of 3 enhancement when a chirped THz pulse is used.
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Uncontrolled terms:quasi-phase-matching - high-order harmonic generation - chirped terahertz pulses - 3D nonadiabatic model - gas cell - macroscopic cutoff - single-dipole cutoff - harmonic efficiency
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