

Abstract Submitted
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High-order harmonic generation of Ar and Ne atoms in intense ultrashort laser fields: An all-electron time-dependent density-functional approach including macroscopic propagation effects¹ PENG-CHENG LI, National Taiwan University, Taiwan, SHIH-I CHU, University of Kansas, USA — We present an accurate study of high-order harmonic generation (HHG) of rare-gas atoms (Ar and Ne) in intense ultrashort laser fields by simultaneous solution of the time-dependent Schrödinger equation and the Maxwell's equation. The single-atom response is calculated by means of *self-interaction-free* time-dependent density-functional theoretical (TDDFT) approach, this approach allows the contributions of the valence electrons of many-electron atoms are considered explicitly and non-perturbatively. Macroscopic propagation effects are taken into account by solving Maxwell's equation using multiple electronic-shell single-atom induced dipole moment. In this study, we show the contributions of multiple electronic shells play an important role in HHG after propagation through the nonlinear medium as the intensity of laser fields is increased.

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