

Numerical simulations of high-order harmonic generation from solids

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We introduced a quasi-classical step-by-step model [1,2] for interband transitions in the k space to reveal the mechanisms of high-order harmonic generation (HHG) in solids. The ultrafast dynamics are also investigated in the real space by solving the time-dependent Schrodinger equations [3]. The inter- and intraband dynamics in k space correspond to the local and global oscillations of the Bloch electron wave packet in the coordinate space moving at phase and group velocities, respectively [4]. Their contributions can be controlled by different laser parameters, such as chirp, pulse duration, carrier-envelope phase, two-color field, and so on. We also introduced an efficient way to enhance the yield of HHG in inhomogeneous laser fields below the damage threshold [5]. We also studied the multi-channel HHG at the edge of the Brillouin zone [6] and the interference between intra- and interband currents [7].

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