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Theoretical investigation of spatial and temporal properties of HHG in solids LUN YUE, CHRISTOPHER ABADIE, MENGXI WU, METTE GAARDE, Louisiana State University — High-order harmonic generation (HHG) in solids has attracted extensive interest in recent years, partly due to its potential as an avenue towards bright and compact extreme ultraviolet radiation. We present a theoretical study of the spatio-temporal properties of the harmonic radiation from a model solid interacting with a focused laser beam. We show in particular that the contributions from the interband and the intraband currents have different spatiotemporal properties. We also explore the consequences of starting from a full valence band, as opposed to a single (Gamma) point in the Brillouin zone, and the influence of dephasing and decay on the harmonic radiation. Finally, we discuss the advantages and drawbacks of the different theoretical methods that exists today for investigation of HHG in solids, ranging from the numerical solution of the time-dependent Schroedinger equation to semiconductor Bloch equations.

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