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Control of Harmonic Genration in SuperLattices-Coherence and Relaxation ANDRE D. BANDRAUK[1], Univ de Sherbrooke, KYRIL PRONIN, Russian Academy of Sciences — We consider a d-dimentional conductor (a superlattice- Phys Rev B 69,195308(2004)) within the independent-electron one-band model taking into account relaxation effects. Its nonperturbative response to time-periodic electric fields is studied analytically for the dynamic and kinetic harmonic generation spectra. It is shown that in the dynamic (short time) regime field induced localization does not influence the high order harmonic spectra whereas in the kinetic (long time) regime all harmonic amplitudes can be suppressed by localization. The harmonic spectra reveal a plateau as in molecular systems (Phys Rev A 49,3943(1994)) and these plateaus are characterized by the parameter eEa/hv, where E is the maximum field amplitude of frequency v and a is the periodicity of the lattice. We show that in the case of a periodic rectangular electric field a new effect of single-mode response occurs:for specific values of the field E and frequency v, all harmonic amplitudes vanish except for a single one. Coherent control of such spectra will be illustrated.

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