432. Title:Excitation of relaxation oscillations in a semiconductor superlattice by incident waves: Efficient terahertz harmonics generation
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Abstract:Generation of terahertz harmonics by frequency multiplication with a semiconductor superlattice due to an excitation of relaxation oscillations by incident waves is investigated

superlattice due to an excitation of relaxation oscillations by incident waves is investigated theoretically. It is shown that the relaxation oscillation excitation becomes feasible if the superlattice dc resistance is low enough in comparison with a characteristic radiation impedance of the external waveguide system. The power of the generated harmonics as a function of the incident wave power demonstrates a threshold-like behavior at a specific input power level dependent on the superlattice peak current. We demonstrate that for typical superlattice parameters the roll-of frequency of the generated harmonics is mostly specified by the plasma frequency of electrons in a superlattice miniband. We argue that an increase of the superlattice miniband widths could essentially enhance both the efficiency and the spectral range of the generated terahertz harmonics.