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Title:Beat excitation of terahertz radiation in a semiconductor slab in a magnetic field
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Abstract:Two infrared lasers of frequencies Ω1 and Ω2 propagating in the TM/TE mode along z direction in a rippled density semiconductor waveguide are shown to resonantly excite terahertz radiation at the beat frequency when ripple wave number is suitably chosen to satisfy the phase matching. The wave vector of the density ripple is along the direction of laser propagation while a static magnetic field is applied transverse to it. The lasers exert a ponderomotive force on the electrons at the beat frequency. This force, in the presence of density ripple and transverse magnetic field, produces a nonlinear current at the terahertz frequency. The magnetic field enhances the amplitude of the terahertz wave. However terahertz yield is significantly higher in the TM mode laser beating than in the TE mode laser beating.
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