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Title:Optically driven quantum dots as source of coherent cavity phonons: A proposal for a phonon laser scheme
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Abstract:We present a microscopically based scheme for the generation of coherent cavity phonons (phonon laser) by an optically driven semiconductor quantum dot coupled to a THz acoustic nanocavity. External laser pump light on an anti-Stokes resonance creates an effective Lambda system within a two-level dot that leads to coherent phonon statistics. We use an inductive equation of motion method to estimate a realistic parameter range for an experimental realization of such phonon lasers. This scheme for the creation of nonequilibrium phonons is robust with respect to radiative and phononic damping and only requires optical Rabi frequencies of the order of the electron-phonon coupling strength. © 2012 American Physical Society.
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