

442. Title:Two-phonon processes of intraband relaxation in the terahertz regime in quantum dots

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Abstract:We theoretically investigate the intraband relaxation of quantum dots in the terahertz regime due to two acoustic phonon scattering by applying a lattice relaxation approach based on the deformation potential coupling between electrons and acoustic phonons. In particular, we find that the relaxation time depends strongly on the ratio of two acoustic phonons. The influences of the energy separation between the ground and first excited state, the quantum dot height, and the lattice temperature on the relaxation time are also discussed. Our theoretical results not only give a reasonable explanation for the current experimental measurement but also provide some insight into two-phonon intraband relaxation in quantum dots.