

Abstract Submitted
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Electron-phonon scattering rates in GaAs and AlAs under hydrostatic pressure NANDAN TANDON, Michigan State University, East Lansing, MI 48824, USA, L. R. RAM-MOHAN, Worcester Polytechnic Institute, Worcester, MA 01609, USA, JOHN D. ALBRECHT, Michigan State University, East Lansing, MI 48824, USA — We present a first-principles plane wave pseudopotential study on the electron-phonon (el-ph) scattering rates in GaAs and AlAs under hydrostatic pressure. Effect of pressure on the band gap and phonon dispersion is well studied in the past, where the direct band gap of GaAs becomes larger than the indirect band gap at X making it an indirect bandgap semiconductor over ~ 3 GPa. Under hydrostatic pressure AlAs remains an indirect bandgap semiconductor with the bandgap decreasing as pressure increases. Phonon dispersion under hydrostatic pressure results in softening of acoustic phonons and optical frequencies shift to higher values. We will discuss the resulting effect of pressure on the el-ph scattering rates. The hydrostatic pressure is varied between 0 – 15 GPa.

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