Hole-LO phonon interaction in InAs/GaAs quantum dots

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We present a study of holes confined in InAs/GaAs quantum dots doped with Be. The interaction between the holes in the dots and the LO phonons of the lattice is studied experimentally by spectroscopy in the FIR (50 – 700 cm\(^{-1}\)) energy range and under the influence of a magnetic field (0-15T). We observe several resonances in magneto-transmission around 200 cm\(^{-1}\). In order to interpret our experimental results, we calculate the coupling between the hole-phonon states, using the Fröhlich Hamiltonian. The resulting polaron states we find are in good agreement with our experimental results.

References


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