

Abstract Submitted
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Resonant magnetopolaron effect in a high-electron-density quantum well in a tilted magnetic field. Anticrossing at TO-phonon frequency.¹ S. N. KLIMIN, J. T. DEVREESE, TFVS, Departement Fysica, Universiteit Antwerpen, B-2610 Antwerpen, Belgium — The cyclotron resonance (CR) spectra are calculated for a high electron density GaAs/AlAs quantum well in a tilted magnetic field taking into account both the electron-phonon and the electron-electron interactions. When the electron density is sufficiently high, the electron-phonon interaction is strongly influenced by screening and by the magnetoplasmon-phonon mixing. As a result of this mixing, a renormalization of the LO-phonon modes occurs, so that the resonant magnetopolaron effect is manifested for CR energies close to the TO-phonon frequency in both perpendicular and tilted configurations of the magnetic field. For a tilted magnetic field, a double splitting of the CR peaks appears due to the resonant magnetopolaron effect and to the anticrossing of CR and plasmon-phonon intersubband modes. The calculated CR peak positions and amplitudes are in good agreement with experiment. It is shown that the experimental CR spectra find an adequate explanation within the polaron concept.

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