

466. Title:Cyclotron resonance mass and Fermi energy pinning in the In(AsN) alloy

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Abstract:We report cyclotron resonance (CR) experiments on the midinfrared alloy InAs_{1-x}N_x grown on GaAs with x from 0% to 1.9%. Using magnetic fields up to 60 T and terahertz photon sources from 3 to 30 THz, we determine the dependence on x of the electron density and CR mass. The increase in the carrier density with increasing x is accompanied by a redshift in the interband photoluminescence emission and is explained in terms of the pinning of the Fermi level to its value at x=0. The high carrier densities ($\sim 10^{18}$ cm⁻³) at x \sim 1% give rise to a CR mass that is only weakly dependent on the excitation energy, significantly weaker than that in InAs.