Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Magneto-absorption in Narrow Gap InSb/AlInSb Parabolic Quantum Wells[1] D. SAHA, G. D. SANDERS, C. J. STANTON, University of Florida, T. KASTURIARACHCHI, W. GEMPEL, M. EDIRISOORIYA, T. D. MISHIMA, R. E. DOEZEMA, M. B. SANTOS, University of Oklahoma — Because of its narrow gap, InSb has considerable promise as a quantum well material because its small conduction-band mass gives it the highest room temperature electron mobility among the III-V materials. We present experiments and calculations for the magneto-absorption spectra in a strained, narrow gap InSb/AlInSb parabolic quantum well. Our calculations are based on the 8-band Pidgeon-Brown model generalized to include the effects of the parabolic confinement potential as well as pseudomorphic strain. Optical properties are calculated within the golden rule approximation and compared with experiments. The magneto-optical absorption spectrum is calculated for magnetic fields from 1 to 8 T for x-linear, e-active and h-active polarizations. Comparison to experiment allows one to accurately determine the quantum confined, spin-split conduction and valence band energies. Results show a sensitive dependence on the strain at the pseudomorphic interfaces.

[1]This work was supported by the NSF under Grants DMR-0520550, DMR-0808086 and DMR 0706313.

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Date submitted: 20 Nov 2009 Electronic form version 1.4