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Exciton Determination of Strain Parameters in InSb/AlInSb Quantum Wells T. KASTURIARACHCHI, X.H. ZHANG, F. BROWN, N. DAI, R.E. DOEZEMA, N. GOEL, S.J. CHUNG, M.B. SANTOS, The University of Oklahoma — Excitons in semiconductors can be used as a tool to probe various material and structural properties. We studied strain-related material parameters in the strained and nonparabolic InSb /AlInSb quantum well system. The strain present in the InSb wells alters the spectrum from that for unstrained systems by introducing a shift in both the heavy and light hole band gaps. With the change of Al concentration in the barrier layers, the strain in the quantum well system can be tuned continuously. Using FTIR spectroscopy, we were able to trace the strain-induced shifts of the exciton energies. The different strain dependence of the light- and heavy-hole band edges allows us to determine deformation potentials a and b simultaneously. Our samples were nominally undoped InSb/AlInSb quantum wells with Al concentration ranging from 5 to15% grown by molecular beam epitaxy on GaAs substrates. This work is supported by the National Science Foundation under Grants No. DMR-0080054 and DMR-0209371

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