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Spin Resolved Cyclotron Resonance and Magneto-absorption in InSb Multiple Quantum Wells[1] XINGYUAN PAN, G.D. SANDERS, C.J. STANTON, University of Florida, T. KASTURIARACHCHI, W. GEMPEL, X.H. ZHANG, R.C. MEYER, N. GOEL, M. EDIRISOORIYA, T.D. MISHIMA, R.E. DOEZEMA, M.B. SANTOS, University of Oklahoma, Y.J. WANG, National High Magnetic Field Laboratory — We present calculations of the spin-dependent cyclotron resonance and magneto-absorption spectra in strained, narrow gap AlInSb/InSb multiple quantum wells. Our calculations are based on the 8-band Pidgeon-Brown model generalized to including the effects of the confinement potential and pseudomorphic strain. Optical properties are calculated within the golden rule approximation and compared with experiments. The large g-factors allow one to spin-resolve the transitions at modest magnetic fields (<10T). In the magneto-absorption, we see spin-split transitions and identify both bright and dark transitions in agreement with experiment. For cyclotron resonance, we see not only spin-resolved anticrossings between Landau levels with the same spin, but also anticrossings between levels of opposite spin. These opposite spin anticrossings result from spin-orbit coupling and the resonance-enhanced mixing of the second Landau level of the ground state subband and the lowest Landau level of the first excited state of opposite spin.

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