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Time Resolved Probe of Spin and Carrier Lifetimes in InSb Based Quantum Wells and Films[1] RAJEEV N. KINI, K. NONTAPOT, M. FRAZIER, B. SPENCER, J.J. HEREMANS, G.A. KHODAPARAST, Department of Physics, Virginia Tech, N. GOEL, S.J. CHUNG, M.B. SANTOS, University of Oklahoma — Semiconductor quantum wells (QWs) based on InSb have potential applications in the rapidly growing field of spintronics. Due the large Bychkov-Rashba and Dresselhaus spin-orbit interaction terms, g factor, and the high electron mobility of InSb, it may be possible to realize a number of novel high speed, spin-sensitive electronic, and optoelectronic devices. A recent measurement has indicated a value of $\sim$ 0.5ps for the room temperature spin lifetime in InSb/AlInSb QWs (Litvinenko *et al*, New Journal of Physics, 8, 49, (2006)). Here we present our measurements of the spin and carrier relaxations in InSb based QWs with symmetric and asymmetric doping profile and n-type InSb films. We use pump probe and magneto-optical Kerr effect (MOKE) spectroscopy to study the dynamics at different excitation wavelengths, power densities, and temperatures. We observe relaxations which last longer than 5ps and our measurements can provide important information regarding the relaxation mechanisms in this narrow gap system.

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