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**Theory of carrier dynamics in InSb parabolic quantum wells**[1] D. SAHA, G.D. SANDERS, C.J. STANTON, University of Florida, M. BHOWMICK, T. MERRITT, G.A. KHODAPARAST, Virginia Tech, T.D. MISHIMA, M.B. SANTOS, University of Oklahoma — InSb, with the narrowest gap among the III-V compound semiconductors, shows considerable promise as a quantum well material because its small conduction-band mass gives it a large room temperature electron mobility, and its large g-factor makes it attractive for spintronic devices. We present experiments and theoretical calculations for carrier dynamics in a strained 50-nm thick 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. We model one and two color, time-resolved pump-probe differential transmission and reflectivity experiments. The change in the infrared probe pulse as a function of delay time provides information on carrier and spin relaxation dynamics. Both interband and intra-band dynamics are studied.

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