

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Carrier and Spin Dynamics in Narrow Gap Parabolic Quantum Well Structures¹ M. BHOWMICK, T. MERRITT, G.A. KHODAPARAST, Virginia Tech, T.D. MISHIMA, M.B. SANTOS, University of Oklahoma, D. SAHA, G.D. SANDERS, C.J. STANTON, University of Florida — Heterostructures with parabolic confinement potentials are important systems to study for many reasons. In a perfect Parabolic Quantum Well (PQW), the subbands are equally spaced and electron-electron interactions are virtually non-existent, allowing coupling of long-wavelength radiation only to the center-of-mass coordinate of the electron system. Narrow band PQW systems are well suited for THz devices because by careful design, one can tune the transition frequency, temperature stability, and narrow-band emission. In our studies, the parabolic confinement was created by an effective parabolic Al compositional gradient inside each well. We studied carrier/spin dynamics in an InSb/ $Al_xIn_{1-x}Sb$ multiple- PQW structure using several time resolved differential transmission schemes in the mid-infrared. Our results demonstrate the unique and complex dynamics in InSb heterostructures that can be important for electronic and optoelectronic devices.

¹Supported by: NSF-DMR-0507866, DMR-0520550, DMR-0706313, and NSF-Career Award DMR-0846834.

Giti Khodaparast

Date submitted: 16 Dec 2010

Electronic form version 1.4