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Gate Tunable InSb Quantum Well Structures grown on GaSb (001) MIHIR PENDHARKAR, ANTHONY MCFADDEN, BORZOYEH SHOJAEI, JOON SUE LEE, CHRIS PALMSTROM, Univ of California - Santa Barbara — Study of quantum well structures with InSb channels is of special interest to the field of spintronics and quantum computing due to the strong spin orbit coupling and large g-factor of InSb. Gate control of InSb quantum wells is a necessary component in construction of an InSb based Spin-Field Effect Transistor. In this work, InSb quantum well structures have been grown on lattice mismatched GaSb substrates by Molecular Beam Epitaxy. Magneto-transport measurements at low temperatures have been used to investigate the influence of gate voltage on electron mobility and density. A conventional metal top gate, separated from the III-V structure with an Atomic Layer Deposited insulating dielectric, has been used. Use of the conducting GaSb substrate as a potential, bottom gate electrode has also been investigated. Surface morphology of as-grown films has been studied using Atomic Force Microscopy.

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