

Abstract Submitted
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Electron bilayers in an undoped Si/SiGe double-quantum-well heterostructure TZU-MING LU, DOMINIQUE LAROCHE, Sandia National laboratories, SHIH-HSIEN HUANG, National Taiwan University, ERIK NIELSEN, Sandia National laboratories, YEN CHUANG, JIUN-YUN LI, CHEEWEE LIU, National Taiwan University — We report the design, fabrication, and the magneto-transport study of an undoped Si/SiGe double quantum well heterostructure. We show that employing asymmetric quantum wells for our single-side-gated devices allows us to observe a cross-over from single-layer-like to bi-layer-like behavior in the mobility-density dependence. We also observe an integer quantum Hall state at filling factor $\nu = 2$, which is expected to arise from inter-layer effects for Si electrons. This state could be due to either inter-layer coherence, or the symmetric-antisymmetric tunneling gap. This work has been supported by the Division of Materials Sciences and Engineering, Office of Basic Energy Sciences, U.S. Department of Energy (DOE). Sandia National Laboratories is a multi program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. DOE's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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