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Enhancement of spin susceptibility of low-density two-dimensional electrons in a high quality Si/SiGe quantum well TZU-MING LU, XIAOYAN SHI, WEI PAN, Sandia National Laboratories, SHI-HSIEN HUANG, CHEEWEE LIU, JIUN-YUN LI, National Taiwan University — We report magneto-transport measurement results of two-dimensional electrons in a high quality Si/SiGe quantum well under tilted magnetic fields. The electron peak mobility reaches 2 x 10^6 cm^2/Vs and the density is varied from 0.8 to 2.1 x 10^{11} cm^{-2}. Under tilted magnetic fields, two Landau levels with opposite spins are brought into energetic coincidence. From the coincidence angles we determine the effective spin susceptibility g*m*. At n =2.1 x 10^{11} cm^{-2}, g*m* ~ 4 (in units of $m_b g_b$), consistent with previous work [Lai et al, PRL 96, 076805 (2006)]. Our results further show that the spin susceptibility is enhanced by 20% at 0.8 x 10^{11} cm^{-2} from its high density value. Surprisingly, unlike previous results in modulation doped Si/SiGe quantum wells, a resistance peak is observed at nu=3 when Landau level coincidence occurs in our undoped Si/SiGe field-effect transistor sample. 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. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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