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A quantitative examination of the collapse of spin splitting in the quantum Hall regime[1] W. PAN, Sandia National Labs, K.W. BALDWIN, K.W. WEST, L.N. PFEIFFER, D.C. TSUI, Princeton University — There is a great deal of current interest in understanding electron spin physics in semiconductors for potential quantum computation applications. The quantum Hall effect in the two-dimensional electron system (2DES) has proved to be a unique system in this avenue due to a tunability in the difference of spin population and thus the strength of exchange interaction provided by the formation of Landau levels. In this talk, we want to present our experimental results to *quantitatively* examine the theoretical model of spin splitting collapse in the quantum Hall regime [by Fogler and Shklovskii, Phys. Rev. B 52, 17366 (1995)] at fixed magnetic fields as a function of electron density in a high quality heterojunction insulated-gate field effect transistor. In the density range between $n = 2\times10^{10}$ and 2×10^{11} cm^{-2}, the Landau level number N follows a power-law dependence on the critical electron density n_c, where the spin splitting collapses, and $N=11.47\times n_c^{0.64\pm0.01}$. This power law dependence is in good agreement with the theoretical prediction in the low density regime.

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