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Density dependence of the 5/2 energy gap[1] Z.G. GE, Princeton University and Sandia National Labs, N. MASUHARA, N.S. SULLIVAN, NHMFL and University of Florida, W. PAN, Sandia National Labs, D.C. TSUI, L.N. PFEIFFER, K.W. BALDWIN, K.W. WEST, Princeton University — In this talk, we will present results from our recent experiments examining the spin-polarization of the 5/2 state by investigating the competition between the Coulomb and Zeeman energies utilizing a HIGFET (heterojunction insulated-gated field-effect transistor) device. Rather than tuning their ratio in a fixed density specimen by tilt, we keep the B-field perpendicular to the 2D electron gas and vary its density. This approach is equivalent to tilting the sample, but it cannot cause a tilted-field induced phase transition. The HIGFET device has a peak electron mobility of 12×10^6 cm^2/Vs, more than a factor of two increase compared to the one used in an earlier study. We observed that in the density range of $1.2 - 3.6 \times 10^{11}$ cm^{-2} the 5/2 state was activated. Therefore, a true 5/2 energy gap was obtained. It increases with increasing electron density. We have fitted the density dependence with various theoretical models and will discuss its implications on the spin polarization of the 5/2 state.

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