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**Tilt Magnetic Field Dependence of the 12/5 Fractional Quantum Hall State** CHI ZHANG, Princeton University, Sandia National Labs, CHAO HUAN, JIAN-SHENG XIA, NEIL S. SULLIVAN, University of Florida and NHMFL, WEI PAN, Sandia National Labs, K.W. BALDWIN, K.W. WEST, L.N. PFEIFFER, D.C. TSUI, Princeton University — The 12/5 state has attracted growing interest due to its superior potential in performing universal topological quantum computation. Up to date, except for the observation of a well developed quantum Hall plateau at this filling, much less experimental work has been carried out and there is no experimental evidence to support this state being a paraferminoic or non-Abelian state. Here, we present our tilt magnetic field dependence results in examining its spin-polarization. It was observed that the diagonal resistance $R_{xx}$ at $\nu$=12/5 shows a non-monotonic dependence on tilt angle ($\theta$). It first increases sharply with increasing $\theta$, reaches a maximal value of $\sim 60\ \Omega$ around $\theta \sim 14^o$, and then decreases with $\theta$ further increased. Correlated with this $R_{xx}$ dependence, the 12/5 activation energy gap ($\Delta_{12/5}$) also shows a non-monotonic $\theta$ dependence. $\Delta_{12/5}$first decreases. Around $14^o$, $R_{xx}$ becomes non-activated and a true activation energy gap is not obtainable. With further increasing $\theta$, $R_{xx}$ becomes activated again and $\Delta_{12/5}$increases with $\theta$. This tilt dependence in $R_{xx}$ and $\Delta_{12/5}$is similar to the composite fermion states at $\nu$=2/5 and 8/5 in the lowest Landau level, which was interpreted as a spin transition. Our results thus call for more investigations on the nature of the 12/5 ground state.

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