

Abstract Submitted
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Observation of a Fractional Quantum Hall State at $\nu = 1/4$ in a Single Wide GaAs Quantum Well DWIGHT R. LUHMAN, Department of Electrical Engineering Princeton University, W. PAN, Sandia National Laboratories, D.C. TSUI, Department of Electrical Engineering Princeton University, L.N. PFEIFFER, K.W. BALDWIN, K.W. WEST, Bell Laboratories — We have performed low temperature ($T \sim 35$ mK) transport measurements using a 50 nm high-quality GaAs quantum well with an electron density of $n_e = 2.55 \times 10^{11}$ cm⁻² and a mobility of $\mu \sim 10^7$ cm²/Vs. Magnetic fields up to $B = 45$ T were used to reach filling factor $\nu = 1/4$. With the sample situated perpendicular to the applied magnetic field, the diagonal resistance displays a kink at $\nu = 1/4$. When the sample is tilted to an angle of $\theta = 20.3^\circ$, a clear minimum in the diagonal resistance and plateau in the Hall resistance are present at $\nu = 1/4$ indicating a fractional quantum Hall state at $\nu = 1/4$ in this sample. Several possibilities regarding the origin of this state will also be discussed.

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