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High Frequency Magneto Oscillations in low Electron Density GaAs/AlGaAs Quantum Wells Y.-W. TAN, Phys. Dept., Columbia Univ., H. L. STORMER, Phys. Dept., Appl. Phys. and Math. Dept., Columbia Univ., and Bell Labs, L. N. PFEIFFER, K. W. WEST, Bell Labs — We have observed exceptional magneto oscillations in modulation doped GaAs/AlGaAs quantum well structures with low (10%) Al barriers. These reproducible, rapid oscillations appear in our low density samples ($n \sim 6.5 \times 10^{10}/cm^2$) after standard illumination and are robust against thermal cycling. They are periodic in *inverse* magnetic field (1/B) and the amplitude increases with temperature up to $\sim 600mK$. With increasing temperature, these oscillations shift from the $\nu \sim 1/2$ range towards the $\nu \sim 1/3$ range of the underlying, low density 2DES. Some aspects are reminiscent of recent work by G. A. Csáthy et. al. (PRL, **92**, 256804(2004)) Under tilt, these oscillations follow the standard $\cos\theta$ behavior of a 2D system. The period, if naively translates into density, yields $1.4 \times 10^{13}/cm^2$, which significantly outnumbers all countable carriers in the device. A backside gate affects the QHE in the 2DES as well as the rapid oscillations, although the density shifts for the latter are highly incompatible with dimensions and screening considerations.

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