Abstract Submitted
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Dependence of pinning modes of 2D electron system on short-ranged alloy disorder B.H. MOON, B.A. MAGILL, L.W. ENGEL, NHMFL/FSU, D.C. TSUI, L.N. PFEIFFER, K.W. WEST, Princeton University — A 2D electron system (2DES) in a low Landau filling (ν) pinned Wigner solid state exhibits a striking resonance in its rf or microwave spectrum. The resonance is understood as a pinning mode, in which the electrons oscillate about their pinned positions, and the frequency (f_{pk}) increases for larger disorder. We report on microwave spectroscopy of the low-ν Wigner solids in $Al_xGa_{1-x}As$-$Al_{0.1}Ga_{0.9}As$ heterojunctions with x=0.4 and 0.8%. The 2DES resides mainly in the dilute $Al_xGa_{1-x}As$, and the alloy disorder has been shown to be randomly distributed [1]. We compare the pinning modes of the samples as density (n, controlled by backgates) and magnetic field are varied. For example, with densities around $n \sim 6.5\times10^{10}cm^{-2}$ (in sample state with no indication of a 1/5 fractional quantum Hall effect) $f_{pk} \approx 5.93$ and 8.55 GHz at $\nu \sim 0.2$ for x=0.4 and 0.8% respectively.

[1] W. Li *et al.*, Appl. Phys. Lett., 83, 2832 (2003).

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