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Effect of vertical confinement on pinning mode of electron solids G. SAMBANDAMURTHY, NHMFL and Princeton University, YONG P. CHEN, Princeton University and NHMFL, LLOYD ENGEL, NHMFL, D.C. TSUI, Princeton University, L.N. PFEIFFER, K.W. WEST, Bell Labs, Lucent Technologies — We present the results from a study of the electron solid regime that terminates the fractional quantum Hall series in very clean two-dimensional electron systems (2DES). The disorder-induced pinning mode of the electron solid appears as a resonance in the microwave conductivity spectrum. In the present study, we compare results from two quantum well samples that were grown in the same way, with the only difference being the well widths (15 and 65 nm), allowing us to observe the effect of vertical confinement of electrons on the pinning mode of electron solids. We find that the narrower well (15 nm width) has a resonance with peak frequency $(f_{pk}) \sim 6$ -8 GHz, whereas the wider well (65 nm width) has $f_{pk} \sim 100$ -200 MHz. Moreover, f_{pk} vs. B for the two samples show markedly different behaviors. Our results suggest that the disorder that dominates the pinning of electron solids is from the interface roughness associated with the quantum well.

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