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Evolution of the $\nu = 1/2$ Fractional Quantum Hall State in Tilted Magnetic Fields[1] HAO DENG, SUKRET HASDEMIR, YANG LIU, MANSOUR SHAYEGAN, LOREN PFEIFFER, KEN WEST, KIRK BALDWIN, Princeton University — We report magneto-transport measurements of two-dimensional electron systems confined to 65-nm-wide GaAs quantum wells with density 1.4 10^{11} cm^{-2}. We observe a remarkable evolution of the magnetoresistance around filling factor ν=1/2 as we increase the tilting angle. The weak ν=1/2 fractional quantum Hall (FQH) state at fully perpendicular field gets stronger as the sample is tilted, but abruptly disappears at higher tilting angles as an insulating phase moves from low fillings to higher ones near ν=1/2. This insulating phase likely signals a bilayer, pinned Wigner crystal. At higher tilting angles, we observe a disappearance of the ν=1 quantum Hall state and the appearance of even-numerator FQH states around ν=1, which are also consistent with the interpretation that the system becomes bilayer.

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