

Abstract Submitted
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Insulating phases in the limit of strong Landau level mixing GABOR CSATHY, DANIEL C. TSUI, Princeton University, LOREN PFEIFFER, KEN WEST, Bell Labs — We have explored the electronic phases of 2D holes subjected to perpendicular magnetic fields in the new regime of very low densities. The sample density is $1.6 \times 10^{10} \text{cm}^{-2}$ and it is tunable with a backgate. At the highest densities, beside the $\nu = 1/3, 2/5,$ and $2/3$ fractional quantum Hall states, we observe both of the previously reported high field insulating and reentrant insulating phases. Similarly to the result in higher density samples, the reentrant insulating phase strengthens as the density is lowered. With a further decrease in density, however, the reentrant insulator unexpectedly weakens then it completely disappears. Since both of the insulating phases have been interpreted as electronic solids, the behavior observed can be regarded as a melting of the solid with decreasing density. Such a melting is at odds with expectations and we think that it reflects the influence of the strong Landau level mixing on the quantum fluctuations of the nodes of the solid.

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