

Abstract Submitted
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Measurement of the local potential in the stripes and bubble phase JENS MARTIN, BASILE VERDENE, Weizmann Insitute of Science, Condensed Matter Physics, Rehovot 76100, ISRAEL, JURGEN SMET, Max-Planck-Insitut fr Festkrperforschung, Heisenbergstr. 1, 70569 Stuttgart, Germany, LOREN PFEIFFER, KEN WEST, Bell Labs, Lucent Technologies, 700 Mountain Avenue, Murray Hill, NJ 07974, USA, AMIR YACOBY, Weizmann Insitute of Science, Condensed Matter Physics, Rehovot 76100, ISRAEL — A single electron transistor is used to probe the local chemical potential of a two- dimensional electron gas in the quantum Hall regime. Our measurements focus on the stripe and bubble phases that occur between filling factors 4 and 5. In the absence of any external transport current we see clear electrostatic signature of the bubble phases at filling 4.25 and 4.75. Once an additional transport current is applied the changes in potential at these filling factors become more pronounced. In contrast, at filling factor 4.5 we cannot detect any measurable change in potential regardless of whether the current is flowing along the hard or easy direction. Increasing the transport current leads eventually to the destruction of the bubble phases. This is observed as a jump and hysteretic behavior in the local potential as well as in the 2-terminal resistance. Surprisingly, the change in potential is an order of magnitude larger than the change in Hall voltage across the sample.

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