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Local Thermometry of Neutral Modes on the Quantum Hall Edge SEAN HART, VIVEK VENKATACHALAM, Harvard University, LOREN PFEIFFER, KEN WEST, Princeton University, AMIR YACOBY, Harvard University — A system of electrons in two dimensions and strong magnetic fields can be tuned to create a gapped 2D system with one dimensional channels along the edge. Interactions among these edge modes can lead to independent transport of charge and heat, even in opposite directions. Measuring the chirality and transport properties of these charge and heat modes can reveal otherwise hidden structure in the edge. Here, we heat the outer edge of such a quantum Hall system using a quantum point contact. By placing quantum dots upstream and downstream along the edge of the heater, we can measure both the chemical potential and temperature of that edge to study charge and heat transport, respectively. We find that charge is transported exclusively downstream, but heat can be transported upstream when the edge has additional structure related to fractional quantum Hall physics.

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