Abstract Submitted
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Heat Transport Measurements on 2D Electron Systems at Zero Magnetic Field using Quantum Point Contacts[1] D.A. NICHOLS, G. GRANGER, J.P. EISENSTEIN, Caltech, J.L. RENO, Sandia, L.N. PFEIFFER, K.W. WEST, Bell Labs — Three adjacent quantum point contacts (QPCs) separated by 20 micrometers are fabricated along the edge of a GaAs/AlGaAs two-dimensional electron gas (2DEG). The 2DEG is heated locally by passing an electrical current through the middle QPC, which is tuned so only a few channels propagate. A thermovoltage develops across a detector QPC on either side of the heater, and its gate voltage dependence is related to the derivative of the conductance of the detector QPC as expected from Mott's formula. The thermovoltage dependences on power and temperature are also investigated. These experiments illustrate the feasibility of using mesoscopic devices to study heat transport in 2D electron gases with various geometries.

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G. Granger
Caltech

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