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Quantum Hall effect in a quantum point contact at Landau filling fraction $\nu = \frac{5}{2}$ JEFFREY MILLER, Harvard University, IULIANA RADU, MIT, DOMINIK ZUMBÜHL, MIT and Basel University, ELI LEVENSON-FALK, Harvard University, MARC KASTNER, MIT, CHARLES MARCUS, Harvard University, LOREN PFEIFFER, KEN WEST, Lucent — We study the transport properties of quantum point contacts (QPC) fabricated on a GaAs/AlGaAs two dimensional electron gas that exhibits excellent bulk fractional quantum Hall effect, including a strong plateau in the Hall resistance at Landau level filling fraction $\nu = \frac{5}{2}$. We find that the $\nu = \frac{5}{2}$ plateau is identifiable in point contacts with lithographic separations as small as 0.8 microns, but is not present in a 0.5 micron QPC. We study the temperature and dc-current-bias dependence of the $\nu = \frac{5}{2}$ plateau—as well as neighboring fractional and integer plateaus—in the QPC. We also discuss our method to study the QPC at one filling fraction while the bulk remains at a higher filling fraction. Research supported in part by Microsoft Corporation, Project Q, and HCRP at Harvard University, and ARO (W911NF-05-1-0062), the NSEC program of the NSF (PHY-0117795) and NSF (DMR-0353209) at MIT.

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