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Improved Measurements of Quasi-Particle Tunneling in the nu = 5/2 Fractional Quantum Hall State[1] XI LIN, COLIN DILLARD, MARC KASTNER, MIT, LOREN PFEIFFER, KEN WEST, Princeton University — It is predicted that the nu = 5/2 fractional quantum Hall state may potentially exhibit novel non-abelian quasi-particle statistics, which would make it a candidate for implementation of topological quantum computation. We present measurements of quasi-particle tunneling between edge channels, which provide information about the wave function of the nu = 5/2 state. Weak tunneling is investigated as a function of temperature and DC bias and fit to the theoretical tunneling conductance. We improve on previous quasi-particle tunneling measurements by reducing measurement noise and studying two different quantum point contact (QPC) geometries. For both QPCs the best fits give e*, the quasi-particle effective charge, close to the expected value of e/4 and g , the strength of the interaction between quasi-particles, close to 3/8. Here we show that fits corresponding to the various proposed wave functions, along with qualitative features of the data, strongly favor the abelian 331 state.

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