Abstract Submitted
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Observation of fractional statistics V.J. GOLDMAN, F.E. CAMINO, W. ZHOU, Stony Brook University — Our present experiment utilizes a novel Laughlin quasiparticle interferometer, where a quasiparticle with charge $e/3$ of the $f = 1/3$ FQH fluid executes a closed path around an island of the $f = 2/5$ fluid. The interference fringes are observed as peaks in conductance as a function of the magnetic flux Φ through the $f = 2/5$ island, in a kind of the Aharonov-Bohm effect. A similar situation of resonant tunneling in an FQH fluid at filling f_1 surrounding an FHQ island at a different filling f_2 was considered theoretically by Jain et. al.. We observe the interference pattern shift by one fringe upon introduction of five magnetic flux quanta into the $f = 2/5$ island, i.e., the Aharonov-Bohm period $\Delta\Phi = 5h/e$, corresponding to excitation of ten $q = e/5$ quasiparticles of the $f = 2/5$ fluid. Such "superperiod" of $\Delta\Phi > h/e$ has never been reported before. This $\Delta Q = 2e$ charge period is directly confirmed in calibrated backgate experiments. These observations imply *relative* statistics of $\Theta^{1/3}_{2/5} = -1/15$, when a charge $e/3$, statistics $\Theta^{=}_{1/3}2/3$ Laughlin quasiparticle encircles one $e/5$, $\Theta^{=}_{2/5}2/5$ quasiparticle of the $f = 2/5$ fluid.

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