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Interference of $e/3$ quasiparticles encircling $2/5$ fractional quantum Hall island PING V. LIN, F.E. CAMINO[1], V.J. GOLDMAN, Stony Brook University — We report experiments in a large, 2.5 micron Fabry-Perot interferometer fabricated from a GaAs/AlGaAs heterostructure. Device is defined by etch trenches; front gates deposited in the trenches allow to tune the device. Tunneling in the two constrictions closes an Aharonov-Bohm path around the 2D electron island. Quantized plateaus in R_{XX} and R_{XY} allow to find out both: the bulk and the constriction filling. Etch trench depletion is such that in the fractional quantum Hall regime we obtain the situation when $1/3$ chiral edge channels pass through the constrictions and encircle an island of the $2/5$ FQH fluid. In this regime the magnetic field oscillation period is 5.4 ± 0.3 of the integer filling 1 period. In this large device magnetic field period well approximates the flux period. We thus conclude that the flux period is $5h/e$, and the corresponding back-gate period is $2e$. These results agree with our previous reports of these superperiods in smaller size devices [1]. The experimental superperiods are interpreted as imposed by the anyonic statistics of the fractionally charged $e/3$ and $e/5$ quasiparticles. [1] F. E. Camino et al., PRB 72, 075342 (2005); W. Zhou et al., PRB 73, 245322 (2006).

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