

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Oscillatory transport in electron Fabry-Perot interferometers F.E. CAMINO¹, P.V. LIN, V.J. GOLDMAN, Stony Brook University — We report experiments on GaAs/AlGaAs heterostructure interferometers in the integer QH regime with filling $f = 1 - 4$. Etch trenches define the device, which consists of an electron island connected to the 2DES bulk via two wide constrictions. Front gates deposited in the trenches permit to fine tune the device. When tunneling occurs in the constrictions, electrons perform closed orbits around the island, producing an Aharonov-Bohm oscillatory signal in the conductance. On QH plateau transition between $f + 1$ and f , we observe f oscillations per flux h/e . In contrast, for all fillings, we observe one oscillation per back-gate charging period e . We also report a linear dependence of magnetic field period on front-gate voltage for three devices, with the slope inversely proportional to f . We attribute this behavior to self-consistent electrostatics of the electron island, and discuss the models of edge channel structure.

¹Present address: Center for Functional Nanomaterials, Brookhaven National Laboratory

V. J. Goldman

Date submitted: 15 Dec 2008

Electronic form version 1.4