Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Edge-State Velocity and Coherence in a Quantum Hall Fabry-Perot Interferometer[1] DOUGLAS MCCLURE, YIMING ZHANG, ELI LEVENSON-FALK, CHARLES MARCUS, Harvard University, LOREN PFEIFFER, KEN WEST, Bell Labs, Alcatel-Lucent — We present finite-bias measurements of electronic Fabry-Perot interferometers in the integer quantum Hall regime. In devices large enough that Coulomb blockade is absent, checkerboard-like patterns of oscillations as a function of magnetic field and dc bias appear. Comparing our data to predictions for electromagnetic Aharonov-Bohm interference, we extract edge-state velocities over a range of magnetic fields, finding dependence consistent with a crossover from skipping orbits at low fields to $E \times B$ drift at high fields. Suppression of visibility observed at high bias and high field is quantitatively accounted for by including an energy-dependent dephasing rate.

[1]We acknowledge funding from Microsoft Corporation Project Q, IBM, NSF (DMR-0501796), and Harvard University.

Douglas McClure
Harvard University

Date submitted: 21 Nov 2008 Electronic form version 1.4