Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Spin-dependent resistivity at transitions between integer quantum Hall states KAMRAN VAKILI, YAKOV SHKOLNIKOV, EMANUEL TUTUC, NATHAN BISHOP, ETIENNE DE POORTERE, MANSOUR SHAYEGAN, Department of Electrical Engineering, Princeton University, Princeton, NJ 08544
— The longitudinal resistivity at transitions between integer quantum Hall states is found to depend strongly on the spin orientation of the corresponding partially-filled Landau level in two-dimensional electrons confined to narrow AlAs quantum wells. By tilting the sample with respect to the applied magnetic field, different Landau level spin branches can be brought to and driven past energetic coincidence. The result is a flip of the spin-orientation for the energy level corresponding to a given quantum Hall transition that is accompanied by a change in resistivity. This change can be as much as an order of magnitude. We discuss possible causes and suggest a new explanation for spike-like features, associated with quantum Hall ferromagnetic transitions, observed at the edges of quantum Hall minima.

Kamran Vakili
Princeton University

Date submitted: 30 Nov 2004 Electronic form version 1.4