Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Emergence of spin structure in quantum wires under strong magnetic fields GILAD BARAK, GEORG SCHUSTERITSCH, AMIR YACOBY, Harvard University, LOREN PFEIFFER, KEN WEST, Bell Labs, Lucent Technologies — We study the effects of a perpendicular magnetic field on the spin and charge structure of a quantum wire. Using momentum resolved tunneling between two parallel wires we measure the dispersion relation for different perpendicular magnetic fields. We find that as the magnetic field increases, charges with opposing spin separate in the cross section of the wire giving rise to strips of polarized and unpolarized electrons. We argue that this structure results from the exchange interaction between electrons in the wire. We discuss the applicability of these results to the structure of Quantum Hall edge states.

Gilad Barak
Harvard University

Date submitted: 20 Nov 2008 Electronic form version 1.4