Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

What Determines the Fermi Wave Vector of Composite Fermions[1] DOBROMIR KAMBUROV, Princeton Univ, YANG LIU, M.A. MUEED, MANSOUR SHAYEGAN, LOREN PFEIFFER, KENNETH WEST, KIRK BALDWIN, Princeton University — We report the observation of a pronounced asymmetry in the magnetic field positions of the commensurability resistance minima of fully spin-polarized composite fermions (CFs) with respect to the field at $\nu = 1/2$ in two-dimensional (2D) electron and hole systems. The asymmetry is observed across a wide range of 2D densities and modulation periods. We can explain the asymmetry quantitatively if we assume that the CFs are fully spin-polarized and their density is equal to the density of the minority carriers in the lowest, spin-resolved Landau level (LL), namely the density of electrons when $\nu < 1/2$ and of holes when $\nu > 1/2$. Our results provide direct evidence that CFs are formed by pairing up of the minority carriers in the lowest spin-resolved LL with flux quanta. They further indicate that the CF commensurability minima are not observed at ν and (1 - ν), as expected from a simple particle-hole symmetry principle, pointing to a subtle breaking of this symmetry.

[1]We acknowledge support through the DOE BES (DEFG02-00-ER45841), the Gordon and Betty Moore Foundation (Grant GBMF4420), Keck Foundation, NSF (ECCS-1001719, DMR-1305691, and MRSEC DMR-0819860). A portion of this work was performed at the NHMFL.

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Date submitted: 14 Nov 2014 Electronic form version 1.4