Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Effects of Landau-level mixing on charge density wave formation in quantum Hall systems PETER SMITH, MALCOLM KENNETT, Simon Fraser University — Anisotropic transport in half-filled Landau levels has been explained in terms of interaction induced charge-density wave (CDW) formation. We use the Hartree-Fock approximation to study the influence of electron-electron interactions and Landau level mixing on the formation of CDWs in two-dimensional electron and hole systems. For the situation of two nearly degenerate levels near the Fermi energy, we construct a Landau theory appropriate for competing order parameters that allows for both striped and triangular CDW formation and use this to construct a phase diagram as a function of filling, Landau level mixing parameter and temperature. We find the possibility of coexisting CDW ordering in the two states, along with possible hysteretic behaviour. We discuss how an external tuning parameter such as Rashba spin-orbit coupling might be used to explore this phase diagram experimentally.

Peter Smith
Simon Fraser University

Date submitted: 20 Nov 2009 Electronic form version 1.4