

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Trial Wavefunctions and Ground State Energies of Some Non-Laughlin Correlated Quantum Hall Systems JOHN QUINN, University of Tennessee — In the lowest Landau level (LL0), incompressible quantum liquid (IQL) states occur at the Laughlin-Jain sequence of filling factors $\nu = n(2pn \pm 1)^{-1}$, where n and p are positive integers. In all of these states, Laughlin correlations (avoidance of pair states with the largest repulsion) are the cause. In the first excited Landau level (LL1), IQL states occur at $\nu' = \nu - 2 = 1/2$. This state and daughter states of Laughlin quasiparticles with $\nu_{QE} = 1/3$ cannot be caused by Laughlin correlations. Paired states described by the Moore-Reed Pfaffian wavefunction and by a novel wavefunction with different pairing correlations are studied as candidate wavefunctions. The energy of each of these states is evaluated analytically for an arbitrary pair pseudopotential $V(L_2)$, where L_2 is the pair angular momentum. Explicit results are derived for a six particle system. The generalization to N particle systems is proposed and compared for both trial functions.

John Quinn
University of Tennessee

Date submitted: 18 Nov 2010

Electronic form version 1.4