Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Ground state of the 5/2 fractional quantum Hall effect in the presence of Landau level mixing[1] EDWARD REZAYI, Cal State Univ- Los Angeles — By now there is widespread agreement that the leading candidates for the quantized Hall states at $\nu = 5/2$ is either the Moore-Read (Pfaffian) state or its particle-hole (PH) conjugate, the anti-Pfaffian. These represent distinct phases of topological matter. In the presence of PH symmetry both are equally valid candidates for the generic Coulomb Hamiltonian; the system will choose one of them by spontaneously breaking the PH symmetry. If, on the other hand, PH symmetry is broken externally one of the two will be selected and an extensive gap will separate the two states. In experiment PH symmetry is broken by inter Landau level (LL) transitions. Previously, in a 3-Landau-level (3-LL) model using exact diagonalization and iDMRG, it was found that the anti-Pfaffian is favored irrespective of the strength of the LL-mixing parameter $\kappa = ke^2/\ell/\hbar\omega$. In a separate approach, Pakrousky et. al.(PRX 5, 2015), using a 2 and 3-body effective Hamiltonian that accounts for LL-mixing to the lowest order in κ, found the opposite, casting doubt on the validity of the 3-LL model. In this talk the source of the discrepancy will be addressed by finite-size calculations for both spherical and toroidal geometries. It will be shown that the two approaches are in agreement.

[1]Supported by DOE

Edward Rezayi
Cal State Univ- Los Angeles

Date submitted: 11 Nov 2016 Electronic form version 1.4