Abstract Submitted
for the FWS15 Meeting of
The American Physical Society

Extracting the topological entropy for a particle-hole symmetric ansatz of the fractional quantum hall effect in the half-filled second Landau level[1] JOHN MCCORD, MICHAEL PETERSON, California State University Long Beach — Quantum entanglement measurements have proven useful in characterizing many-body quantum states. In particular, entanglement entropy is a highly effective tool for probing topological order. In this work, we estimate the topological entanglement entropy for a particle-hole symmetric ansatz of the fractional quantum hall effect in the half-filled second Landau level. As a preliminary measure we characterize the parent Hamiltonian, in terms of Haldane pseudopotentials, that produces the particle-hole symmetric ansatz as its exact ground state. We then probe its topological order by estimating the topological entanglement entropy. We find the topological entanglement entropy to be 1.2 ± 0.4 (the non-Abelian Moore-Read Pfaffian state has topological entanglement entropy of $\gamma = \ln(8)/2 \approx 1.04$ for comparison).

[1]Funded through the Department of Physics Astronomy Summer Research Scholarship and the National Science Foundation DMR-1508290.

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Date submitted: 12 Oct 2015 Electronic form version 1.4