Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Real Space Entanglement Spectrum of Fractional Hall States EDWARD REZAYI[1], CSU Los Angeles, JEROME DUBAIL[2], NICHOLAS READ[3], Yale University — The entanglement spectrum has been shown by Li and Haldane to provide a reliable tool to detect the topological order of Hall states. For example, bi-partitioning the system in orbital space produces the signature count of Hall edge states. The spectrum, however, appears to bear no resemblance to the linear spectrum conjectured by Kitaev and Preskill analogous to the actual edge mode dispersion. Here we employ two types of cuts: a real space and a modified particle bi-partitioning. On the sphere, we obtain the entanglement spectrum for the Laughlin, Moore-Read and Read-Rezayi states for both. We also consider the filled Landau level with a real space cut and show that the Laughlin state for ν=1/3 has the same count of levels, which agrees with the chiral CFT (for up to $\Delta M = N/2$, $\Delta M = L_{\max} - L_z$). Moreover, the entanglement spectrum of the Laughlin state approaches a linear spectrum, similar to the filled Landau level, as the size of the system increases.

[1]supported by DOE grant no. DE-SC0002140
[2]Supported by Yale Postdoctoral Prize Fellowship
[3]Supported by NSF grant no. DMR-1005895

Edward Rezayi
CSU Los Angeles

Date submitted: 22 Nov 2011 Electronic form version 1.4