

Abstract Submitted  
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**Searching for the Topological Degeneracy in the Hubbard Model on a Honeycomb Lattice** BRYAN CLARK, Princeton Center for Theoretical Science, Princeton University — Recent quantum Monte Carlo calculations by Meng, et. al [1] have produced strong numerical evidence for a topological  $Z_2$  spin liquid on the Hubbard model on the honeycomb lattice. One feature of these spin liquids is the presence of a ground state degeneracy that depends on the manifold on which the system lives. Using finite temperature QMC calculations, we identify what states can live in the low-lying spectra, constraining the options for topologically degenerate ground states. In this talk we discuss these bounds and the implications for the  $Z_2$  spin liquid. [1] Z. Y. Meng, T. C. Lang, S. Wessel, F. F. Assaad, and A. Muramatsu, "Quantum spin-liquid emerging in two-dimensional correlated Dirac fermions," *Nature* 464, 847 (2010).

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