Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

SO(N) Singlet Projection Model on the Kagome Lattice[1]
MATTHEW BLOCK, Cal State Univ - Sacramento, RIBHU KAUL, University of Kentucky — We explore the SO(N)-symmetric, nearest-neighbor singlet projection model on the two-dimensional kagome lattice using a quantum Monte Carlo simulation that employs the stochastic series expansion with global loop updates. There is no sign problem with this model, which is appropriate for nonbipartite lattices. We characterize the valence bond solid (VBS) phase that emerges for sufficiently large N and, by augmenting our model with either a next-nearest neighbor interaction that tends to order spins on the same sublattice, which encourages magnetic order for large N, or a plaquette-like interaction, which encourages VBS order for small N, we are able to examine the properties of the quantum phase transitions separating the two ordered phases. This work attempts to build off the success of investigations of the same SO(N) model on the triangular lattice [Kaul, Phys. Rev. Lett. **115**, 157202] and the analogous SU(N) model on the bipartite square, rectangular, and honeycomb lattices [Kaul and Sandvik, Phys. Rev. Lett. **108**, 137201; Block, Melko, and Kaul, Phys. Rev. Lett. **111**, 137202] where the model is a natural generalization of the SU(2), spin-1/2 Heisenberg antiferromagnet.

[1]XSEDE (SDSC, Comet): DMR-130040; DMR-1056536

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Date submitted: 11 Nov 2016 Electronic form version 1.4