Properties of a Single Hole in a Kagome Antiferromagnet

SUMIRAN PUJARI, Cornell University, MICHAEL J. LAWLER, SUNY at Binghamton, Cornell University — Various Spin Liquid states have been considered as candidate ground states for the frustrated Kagome Antiferromagnet. Ran et al showed that the Dirac Spin Liquid (DSL) state has the lowest ground state energy amongst several proposals\(^1\)\(^2\). Assuming the DSL as the ground state, we consider the question of a single hole doped into the antiferromagnet. Our aim is to calculate the hole spectral function 1) at mean field level - where the DSL mean field decomposition of the Heisenberg exchange term forms a background field in presence of which the hole propagates, and 2) beyond mean field - where the question is whether the fluctuations of the DSL mean field renormalizes the hole in a nontrivial way or not.