Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

A soluble model for a Spin-1 Kagomé Antiferromagnet KIRILL SHTENGEL, Caltech, GIL REFAEL, KITP, UCSB — We propose an exactly soluble spin-1 model on a $2D$ Kagomé lattice. The Klein-type Hamiltonian involves interactions between nearest and next-nearest spins and, unlike the closely related AKLT Hamiltonians, has extensively degenerate ground states. These ground sates are characterised by an exponential fall-off of correlations between spins which strongly suggests a gap to the excited states. Simple spin-1 and spin-0 excitations can be viewed as bound states of $S = 1/2$ spinons. We also show that generic Heisenberg-like perturbations lead to a unique ground state – a featureless fluctuating valence bond "solid" obtained by placing a benzol ring on every hexagon of the lattice. Finally, we consider an additional term of the type $\alpha(S^z)^2$ which can drive the system into another featureless ground state. We introduce the notion of "wedge" excitations that allow to distinguish between these states leading to the conclusion that these sates must be separated by at least one quantum phase transition.

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Date submitted: 02 Dec 2004

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