

Abstract Submitted
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DMRG study of the Kagome Antiferromagnetic Heisenberg Model SIMENG YAN, STEVEN WHITE, UCI — We have used DMRG to study the $S=1/2$ Heisenberg model on the Kagome lattice, using cylindrical boundary conditions and large clusters. We have focused on the spin gap and the presence or absence of the Valence Bond Crystal (VBC) order with a 36 unit cell as studied by Marston and Zeng, Singh and Huse, and others. Our results are probably the highest accuracy results for large clusters to date. Our extrapolated results find a finite spin gap with a value of about 0.05 J. To determine whether VBC order occurs, we calculated the ground states of a variety of clusters, some of which allow the 36 site VBC order, and others which do not allow it. For narrower cylinders (width < 12), the VBC patterns are found to vanish as the number of kept states increases. For wider systems, we do observe VBC ground states, but it is not always clear that the calculations have converged. The extrapolated energies of the two types of states are very close, within about 1%.

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