GROUND STATE OF TWO-DIMENSIONAL HEISENBERG ANTIFERROMAGNET ON BIPARTITE UNIFORM LATTICE: RVB APPROACH

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9.7 cm

Up to now, the influence of quantum fluctuations on the long range (LR) magnetic order in nearest neighbor, spin-$\frac{1}{2}$ antiferromagnetic (AF) lattice systems has been examined for eight from the eleven existing uniform lattices. Such lattices (e.g., square, triangular, kagomé) are formed from different regular polygons. The LR order in the ground state of an AF spin system on a uniform (bipartite) lattice consisting of squares, hexagons and dodecagons, has been most recently investigated by variational and exact diagonalization methods. Here, the analysis of the same system within the RVB approach is presented. The results suggest the existence of LR magnetic order in this system. In the light of this and literature results, a simple conjecture concerning the existence of the long range order in the ground state of any two dimensional, uniform antiferromagnets is examined.

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