THERMODYNAMICAL PROPERTIES OF THE SPIN-$\frac{1}{2}$ HEISENBERG ANTIFERROMAGNET ON THE DECORATED SQUARE LATTICE

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9.7 cm

Two dimensional quantum Heisenberg spin systems with strong frustration which do not exhibit long range magnetic order in the ground state are currently being a subject of experimental and theoretical interest. It is well established that in such systems the excitation spectrum has a gap which can also be noticed in the temperature dependence of the specific heat. Recently it has been suggested[1] (using $1/N$ expansion and Mean Field Approximation) that the Heisenberg antiferromagnet on the decorated (in a checkerboard way) square lattice (so-called *squagome* lattice) should have a disordered ground state and and two-peak specific heat. The aim of our work is to present *a*) the justification of the existence of the additional low-temperature specific-heat peak by means of quantum decimation scheme of Suzuki and Takano[2] and *b*) some variational ground state functions for the Heisenberg antiferromagnet on the *squagome* lattice.

[1]Rahul Siddharthan, Antoine Georges, cond-mat/0103334.
[2]H. Takano, M. Suzuki, J. Stat. Phys. **26**, 635 (1981).

13.4 cm

Subject category :

6. Theory of Magnetism

Presentation mode :
poster

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