Abstract Submitted
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AntiFerromagnetic Heisenberg model on three lattices by a self-consistent Gaussian study SHIRIN POURMIRI, Univ of Delaware — The low temperature dynamics of the classical Heisenberg antiferromagnet with nearest neighbor interaction on three lattices were studied using self-consistent Gaussian approximation(SCGA). It is reported that the results from SCGA method are identical to the Monte Carlo's results. The phase transition temperature(Tc=1.37) and critical exponent of susceptibility(γ =1.34) on simple cubic lattice are obtained by applying SCGA method on correlation function. Also the SCGA method is considered on FCC lattice and it is observed that the system cannot find a unique ground state and maintains its geometrical frustration. The effect of weak second-neighbor exchange on the appearance of order in FCC lattice is considered and points in which the antiferromagnetic order arise, are calculated. Moreover XY model on kagome lattice is studied and it's reported that there is no phase transition in this model. But the effect of adding anisotropic term to Hamiltonian is considered and phase transition temperature and critical exponent of susceptibility is obtained through SCGA: Tc=0.15, Tc=0.28 and Tc=0.40 respectively for D=0.2,D=0.5 and D=1 which are well consistent with Monte Carlo simulation.

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