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Magnetic Response of J1-J2 Spin Hamiltonian from Classical Monte Carlo and Schwinger Boson Mean Field Theory

Jung Hoon Han
Sungkyunkwan University, Suwon, Korea

Magnetic susceptibilities at several wave vectors (0,0), (pi,0), (0,pi) and (pi,pi) and the specific heat are analyzed for the antiferromagnetic J1- J2 spin Hamiltonian by classical Monte Carlo and Schwinger boson mean field theory calculations. We find nearly linear-T behavior of the uniform susceptibility consistent with recent susceptibility measurements on FeAs parent compound. The linear-T susceptibility behavior diminishes as |2J2-J1| approaches zero. We conclude that the experimental observation of the linear temperature dependence of susceptibility is possible only when the relevant physical parameters are sufficiently removed from the putative critical point J1 = 2J2 for FeAs.

Keywords : J1-J2 Spin Hamiltonian, magnetic susceptibility, critical point