MONTE CARLO STUDY OF PHASE DIAGRAMS OF THE MIXED SPIN-1/2 AND SPIN-1 ISING SYSTEM

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9.7 cm

The standard Metropolis algorithm and histogram Monte Carlo simulations have been applied to study the phase diagrams of mixed spin-1/2 and spin-1 Ising model. Three different geometrical structures, namely, the square lattice ($L \times L$), the bilayer system ($L \times L \times 2$) and the simple cubic lattice ($L \times L \times L$) with $L \leq 64$ have been investigated and the crystal-field dependences of the critical temperature have been obtained. The Monte Carlo results are compared with those of the standard Bethe-Peierls-Weiss approximation. The occurrence of the tricritical behaviour and the first order phase transition in the system is analysed in detail and a possible relation of the model under investigation to experimental bimetallic molecular-based magnetic systems is also discussed.

13.4 cm

Subject category :

5. Phase Transitions and Critical Phenomena

Presentation mode :
poster

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