

Critical Properties of Mixed Ising Spin System with Different Trimodal Transverse Fields in the Presence of Single-Ion Anisotropy

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Abstract: Within the framework of an effective field approximation, the effects of single-ion anisotropy and different trimodal transverse fields of two sublattices on the critical properties of the mixed spin-1/2 and spin-1 Ising system are investigated on the simple cubic lattice. A smaller single-ion anisotropy can magnify magnetic ordering phases and a larger one can depress magnetic ordering phase for T - $\Omega_{1/2}$ space at low temperatures, while a smaller single-ion anisotropy can hardly change the value of critical transverse field for T - Ω_1 space. On the other hand, influences of two different trimodal transverse fields concentrations on tricritical points and magnetic ordering phases take on some interesting results in T - D space. The main reason comes from the common action of single-ion anisotropy, different transverse fields and two trimodal distributions.

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Key words: critical property, mixed spin system, trimodal transverse field, single-ion anisotropy

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