

THERMODYNAMIC AND RELAXATION DYNAMICS OF THE SPIN-GLASS MODEL WITHIN CLUSTER APPROXIMATION

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Within the two-particle cluster approximation and within the Glauber dynamics approach we study an Ising-type model with essential competing short-range interaction (first coordination sphere with distribution $(1-x)\delta(\sigma-1)+x\delta(1+\alpha)$ of interaction and with Gaussian distribution of interaction parameter) and with weak competing long-range interactions for different lattices. The system of equations for average values of dynamic short-range field and dynamic long-range field and its dispersions is found. The linear dynamic susceptibility and $T-x$ phase diagram are explored. It is shown that at low frequency the imaginary part of the susceptibility exhibits a low-temperature peak which corresponds to the system transition to a non-ergodic state. We demonstrate an essential smoothing of the temperature peaks of the real and imaginary parts of the susceptibility due to macroscopic fluctuations of competing interactions concentration.

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