

NUMERICAL ANALYSIS FOR A MEAN-FIELD EQUATION FOR THE ISING MODEL WITH GLAUBER DYNAMICS

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摘要

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Abstract In this paper, a mean-field equation of motion which is derived by Penrose (1991) for the dynamic Ising model with Glauber dynamics is considered. Various finite difference schemes such as explicit Euler scheme, predictor-corrector scheme and some implicit schemes are given and their convergence, stabilities and dynamical properties are discussed. Moreover, a Lyapunov functional for the discrete semigroup $\{S_n\}_{n>0}$ is constructed. Finally, numerical examples are computed and analyzed. It shows that the model is a better approximation to Cahn-Allen equation which is mentioned in Penrose (1991).

Key words

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