



北京理工大学

数学与统计学院学术报告

Near-critical behavior of random field Ising model

报告人: 夏傲腾 (北京大学)

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摘要:

We study the two dimensional random field Ising model in a box with size N where the external field is given by i.i.d. normal variables with mean 0 and variance ϵ^2 and derive the following phase transition of boundary influence (i.e., the difference between the spin averages at the center of the box with the plus and the minus boundary conditions) at critical temperature $T_c = T_c(2)$: For $\epsilon \ll N^{-7/8}$, the boundary influence decays as $N^{-1/8}$; for $\epsilon \gg N^{-7/8}$, the boundary influence decays as $N^{-1/8}e^{-\Theta(\epsilon^{8/7}N)}$.

We also study the two dimensional random filed FK-Ising model. The total variation (TV) distance between the FK-Ising measures with and without external filed has the following phase transition: The critical order for ϵ is N^{-1} , $N^{-15/16}$ and $N^{-1/2}$ for $T > T_c$, $T = T_c$ and $0 < T < T_c$ respectively; in each case, above this critical order, the TV distance converges to 1 as N goes to infinity and to 0 below.

This talk is based on joint works with Jian Ding, Chenxu Hao and Fenglin Huang.

邀请人: 徐伟、侯浩杰