



### Near-critical behavior of random field Ising model

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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  $\epsilon^2$  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 field FK-Ising model. The total variation (TV) distance between the FK-Ising measures with and without external field has the following phase transition: The critical order for  $\epsilon$  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