

Critical Behavior of Gaussian Model on X Fractal Lattices in External Magnetic Fields

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(Received: 2002-7-26; Revised: 2002-9-29)

Abstract: Using the renormalization group method, the critical behavior of Gaussian model is studied in external magnetic fields on X fractal lattices embedded in two-dimensional and d-dimensional ($d > 2$) Euclidean spaces, respectively. Critical points and exponents are calculated. It is found that there is long-range order at finite temperature for this model, and that the critical points do not change with the space dimensionality d (or the fractal dimensionality d_f). It is also found that the critical exponents are very different from results of Ising model on the same lattices, and that the exponents on X lattices are different from the exact results on translationally symmetric lattices.

PACS: 64.60.A, 75.10.H

Key words: Gaussian model, X fractal, renormalization group, critical phenomena

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