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Spatially Anisotropic d=3 Ising, XY Magnetic and Percolation Systems: Exact Renormalization-Group Solutions of Hierarchical Models AYKUT ERBAŞ, Koç U. and ITU, ASLI TUNCER, ITU, BURCU YÜCESOY, ITU, A. NIHAT BERKER, Koç U. and MIT — Hierarchical lattices that constitute spatially anisotropic systems are introduced. These lattices provide exact solutions for hierarchical models and, simultaneously, approximate solutions for uniaxially or fully anisotropic $d = 3$ physical models. The global phase diagrams, with $d = 2$ and $d = 1$ to $d = 3$ crossovers, are obtained for Ising, XY magnetic models and percolation systems, including crossovers from algebraic order to true long-range order.[1] Our approach has been applied to spatially anisotropic $d = 3$ tJ models of electronic conduction.[2]

1. A. Erbaş, A. Tuncer, B. Yücesoy, and A.N. Berker, Phys. Rev. E **72**, 026129 (2005).
2. M. Hinczewski and A.N. Berker, cond-mat/0504741.

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