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Critical properties of three-dimensional lattice multiflavor scalar chromodynamics

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We study the nature of the transition of a three-dimensional lattice scalar model characterized by a nonabelian SU(N_c) gauge symmetry and a continuous global flavor symmetry. For $N_f > 1$ this model presents two different phases, associated with the spontaneous breaking of the flavor symmetry, hence it is an ideal tool to investigate whether the presence of nonabelian gauge symmetry can affect the critical properties of a statistical field theory. Two different effective models are studied, which are expected to describe the phase transition when the gauge degrees of freedom are relevant (continuum scalar chromodynamics) or when they are irrelevant (gauge invariant Landau-Ginzburg-Wilson approach), and their predictions are checked against the results of numerical lattice simulations.

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