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Random Fields at a Nonequilibrium Phase Transition[1] HATEM BARGHATHI, THOMAS VOJTA, Missouri University of Science and Technology
— We study nonequilibrium phase transitions in the presence of disorder that locally breaks the symmetry between two equivalent macroscopic states. In low-dimensional equilibrium systems, such random-field disorder is known to have dramatic effects: it prevents spontaneous symmetry breaking and completely destroys the phase transition. In contrast, we show that the phase transition of the one-dimensional generalized contact process persists in the presence of random-field disorder. The ultraslow dynamics in the symmetry-broken phase is described by a Sinai walk of the domain walls between two different absorbing states. We discuss the generality and limitations of our theory, and we illustrate our results by large-scale Monte Carlo simulations.

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