

Abstract Submitted
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Monte Carlo Studies of Irreversibly Growing Droplets on Small-World Graphs HOWARD RICHARDS, Physics, Marshall University — For the Ising model on a regular, nearest-neighbor lattice of less than 6 dimensions, metastable decay occurs via the nucleation of critical droplets; subcritical droplets are biased toward shrinkage, whereas supercritical droplets are biased toward growth. The size of a critical droplet is governed by the competition between the coupling of the magnetic field to the volume V of the droplet, which lowers the free energy, and the coupling of the droplet of the stable state to metastable state at the surface S of the droplet, which increases the free energy. This competition between volume effects and surface effects makes the isoperimetric dimension d , defined by $(d-1)/d \equiv (V/S)(dS/dV)$, relevant to metastable decay. The simulations show that for a moderate percentage of small-world connections, d tends to saturate at 6, as should be expected from work on regular lattices.

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