

Abstract Submitted  
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**Metastable Decay in the Square-Lattice Ising Model: Restriction to a Single Droplet**<sup>1</sup> HOWARD L. RICHARDS, Physics and Physical Science, Marshall University, JAMES W. HOWARD, Math, Morehead State University — For finite, regular, Euclidian lattices of Ising spins with nearest-neighbor ferromagnetic interactions, the “metastable” state, in which practically all spins are antiparallel to a weak magnetic field, can persist for a long time (measured in Monte Carlo steps per spin). Extensive previous studies have shown that the mechanism of decay depends on the relationships between the size of the lattice, the critical droplet radius, and the average distance between nucleating droplets. During the 2010 session of Marshall University’s REU in Computational Science, we have used the Boost Graph Library to explore the effect of restricting the “stable state” to a single connected region. Such a restriction could simplify future studies of metastable decay on random graphs. However, the restriction produced some unexpected effects on the metastable lifetime, which we suspect are due to the entropic self-repulsion of the droplet boundary.

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