

Abstract Submitted  
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**Shape Comparison Between Non-equilibrium Droplets and Equilibrium Crystal Shapes for the 2D Ising Model**<sup>1</sup> HOWARD L. RICHARDS, Physics, Marshall University, AUSTIN SHIELDS, Physics, Richard Stockton College of NJ, AUSTIN GERMILLER, Computer Science, Oklahoma Baptist University, JESSE RAFFIELD, Physics, Florida State University — We use the Boost Graph Library to identify droplets in the single-droplet region of metastable decay for the 2D Ising model (using a single-spin flip algorithm), and likewise for equilibrium crystals (using Kawasaki dynamics). As a quantitative way of comparing shapes, we measure the number of broken bonds for the droplets/crystals and also (using the `igraph` library) the graph-theoretic diameter. Both measurements show that the droplets and crystals have the same shapes on average. This is consistent with earlier research, which used the nucleation rate of droplets to compare their surface free energy with the free energy of equilibrium crystals. The advantage of the present method is that it can be extended to nucleation and growth on irregular lattices.

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