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Domain Growth Behavior in the Compressible Ising Model[1]
MENG MENG, DAVID LANDAU, Center for Simulational Physics, University of Georgia — We perform large scale Monte Carlo simulations to study long-time domain growth behavior in a compressible, spin-exchange, two-dimensional triangular-lattice Ising model with continuous particle positions and zero total magnetization. To investigate the effects of compressibility on domain growth behavior, we include an elastic energy term in the Hamiltonian of our model to adjust the rigidity. The system is quenched below the critical temperature from a homogenous disordered state to an ordered phase where multiple domains coexist. Theory expects the domain size $R(t)$ grow as a power law $R(t) = A + Bt^n$, where t is the time after quench, and n is the domain growth exponent. Lifshitz and Slyozov have predicted n to be $\frac{1}{3}$ at late-time, but earlier studies[2] suggested that n could be affected by compressibility. We observe the domain growth exponent to be significantly smaller than the Lifshitz-Slyozov value of $n = \frac{1}{3}$.

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[2]S. J. Mitchell and D. P. Landau, Phys. Rev. Lett. **97**, 025701(2006).

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