# Cellular automaton for the order-disorder transition

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**Abstract**

We propose a probabilistic cellular automaton model with a rule that interchanges neighboring atoms to simulate the diffusion driven dynamics of binary alloys. In particular, we consider the ordering transition of two dimensional binary alloys on a square lattice by assuming antiferromagnetic couplings and measure the energy, specific heat, and correlation functions as functions of temperature. We perform damage spreading simulations and the phase space structure that emerges consists of a single paramagnetic thermodynamic state at high temperatures and a two-basin phase space at low temperatures. The results are compatible with an order-disorder phase transition at a temperature close to the Onsager exact value.