Non-equilibrium clustering and the Mermin-Wagner-Hohenberg theorem

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In this work we study the absorbing state phase transition of a recently introduced model for interacting particles with neighbourhood-dependent evolution rates[1,2,3]. The novelty of the transition is that as soon as the active phase is reached by increasing a control parameter a periodically arranged structure of the particles appear.
A detailed numerical study in one and two dimensions shows that the system falls into the Directed Percolation Universality class[4] in good agreement with theoretical field prediction.
On the other hand, numerical finite size scaling methods show a surprising behavior, patterns in one and two dimensions persist also in the termodinamic limit, contrary to the awaited behavior given by Mermin-Wagner-Hohenberg theorem[5].

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