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Geometrical relations during coarsening for the Potts model, MARCOS PAULO DE O. LOUREIRO, *Universidade Federal de Viçosa - Campus Rio Paranaíba*, JEFERSON J. ARENZON, *Universidade Federal do Rio Grande do Sul*, LETICIA F. CUGLIANDOLO, *Université Pierre et Marie Curie* ■When taken out of equilibrium by an instantaneous temperature quench, from above to below the critical temperature, several systems form a time evolving complex pattern (coarsening) in which several equilibrium phases compete. The energy excess is concentrated at the interfaces (hulls) separating these several states while the curvature-driven dynamics attempts do decrease the total length of these interfaces. Despite the very different nature of these systems, many of them satisfy the dynamic scaling hypothesis that states that the behavior becomes universal when a proper rescaling is performed using the characteristic length $R(t)$ that increases in time as $t^{1/2}$ when the order parameter is not conserved. The study of the topological and geometrical properties in liquid crystals, soap froths, cellular tissues, magnetic materials, superconductors and polycrystalline microstructures has attracted attention for several decades. The morphology of the coarsening patterns in these experimental systems can be reproduced by the q-states Potts model. Several phenomenological laws have been proposed from the analysis of area and perimeter (e.g.,the Lewis and Fetham's laws) and confronted with data from two-dimensional biological tissues and metal grains. Here we follow the formation and evolution of patterns generated by Monte Carlo simulations of the two-dimensional Potts model for several values of q after a deep quench in order to check the validity of those empirical laws in less isotropic systems and the dependence on the order of the underlying phase transition and the amount of correlation present in the initial state.

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