

[P2] Universality classes and crossover behaviors in non-Abelian directed sandpiles

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We study universality classes and crossover behaviors in non-Abelian directed sandpile models, in terms of the metastable pattern analysis. The non-Abelian property induces spatially correlated metastable patterns, characterized by the algebraic decay of the grain density along the propagation direction of an avalanche. Crossover scaling behaviors are observed in the grain density due to the interplay between the toppling randomness and the parity of the threshold value. In the presence of such crossovers, we show that the broadness of the grain distribution plays a crucial role in resolving the ambiguity of the universality class. Finally, we claim that the metastable pattern analysis is important as much as the conventional analysis of avalanche dynamics.

References

- [1] H.-H. Jo and M. Ha, arXiv:1004.4861v2 (2010).