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Surface critical behavior at a nonequilibrium phase transition[1]

HYUNHANG PARK, MICHEL PLEIMLING, Virginia Tech — We study the local critical phenomena at a dynamic phase transition by means of numerical simulations of the kinetic Ising models with surfaces subjected to a periodic oscillating field. We examine layer-dependent quantities, such as the period-averaged magnetization per layer $Q(z)$ and the layer susceptibility $\chi_Q(z)$, and determine local critical exponents through finite size scaling. Both for two and three dimensions, we find that the values of the surface exponents differ from those of the equilibrium critical surface. It is revealed that the surface phase diagram of the nonequilibrium system is not identical to that of the equilibrium system in three dimensions.

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