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Hydrodynamic limit of a model of unstable diffusive interface growth[1] MATTEO NICOLI, Universidad Carlos III de Madrid, MARIO CASTRO, Universidad Pontificia Comillas de Madrid, RODOLFO CUERNO, Universidad Carlos III de Madrid — Recently we have proposed a stochastic moving boundary model to describe the morphological evolution of a large class of diffusive growth systems, with thin film production by Chemical Vapor Deposition and Electrochemical Deposition (ECD) as relevant physical examples. The model has a direct connection with measurable experimental parameters. In order to study the hydrodynamic limit of this model we have performed a small slopes expansion (SSE) that leads to an effective interfacial stochastic equation (ISE). In case of attachment kinetics much larger than the mean growth velocity the kinetic roughening exponents of this ISE are completely different from those of standard universality classes. This equation is a particular instance of a new class of nonlocal interface equations whose novel properties we have studied by numerical and RG techniques. In order to study the model beyond the SSE we have mapped it into an equivalent phase-field model. Numerical simulations of the latter show a remarkable quantitative agreement with ECD experiments.

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