

Short-range stationary patterns and long-range disorder in an evolution equation for one-dimensional interfaces

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Abstract-

A local evolution equation for one-dimensional interfaces is derived in the context of erosion by ion beam sputtering. We present numerical simulations of this equation which show interrupted coarsening in which an ordered cell pattern develops with constant wavelength and amplitude at intermediate distances, while the profile is disordered and rough at larger distances. Moreover, for a wide range of parameters the lateral extent of ordered domains ranges up to tens of cells. We also provide analytical estimates for the stationary pattern wavelength and mean growth velocity.

Index Terms- ion-sputtered surfaces, aeolian sand ripples, thin-film growth, instabilities, model

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