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Statics and dynamics of elastic manifolds in media with long-range correlated disorder[1] ANDREI FEDORENKO, PIERRE LE DOUSSAL, KAY WIESE, CNRS - LPT ENS, 24 rue Lhomond, 75231 Paris, France — We study the statics and dynamics of an elastic manifold in a disordered medium with quenched defects correlated as $\sim r^{-a}$ for large separation r. We derive the functional renormalization group equations to one-loop order, which allow us to describe the universal properties of the system in equilibrium and at the depinning transition. Using a double $\varepsilon = 4-d$ and $\delta = 4-a$ expansion, we compute the fixed points characterizing different universality classes and analyze their regions of stability. The long-range disorder-correlator remains analytic but generates short-range disorder whose correlator exhibits the usual cusp. The critical exponents and universal amplitudes are computed to first order in ε and δ at the fixed points. At depinning, a velocity-versus-force exponent β larger than unity can occur. We discuss possible realizations using extended defects.

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