Hidden degrees of freedom in the motion of interfaces in disordered media

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Interfaces are defined as the geometric boundary separating distinct coexisting phases in extended media. Effective models for the dynamics of such systems, in their simplest versions, focus on the (visible) position of the interface. However, certain (hidden) degrees of freedom internal to the materials can play an unexpected role: this is the case for instance of phases in magnetic material, or inertia in massive interfaces. Such internal degrees of freedom can play the role of a memory, influencing the dynamics of the extended domain walls they present. I will review results on this topic and focus on simple toy models of this phenomenon, illustrating the interplay between memory, dissipation and drive.