

Singular limit of a damped wave equation with a bistable nonlinearity

by

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We study the singular limit of a damped wave equation with a bistable nonlinearity. In order to understand interfacial phenomena, we derive estimates for the generation and the motion of interfaces. We prove that steep interfaces are generated in a short time and that their motion is governed by mean curvature flow under the assumption that the damping is strong enough. To this purpose, we prove a comparison principle for the damped wave equation and construct suitable sub- and super-solutions. The equation which we study is inspired upon a model derived by Brandon, Nepomnyashchy, Novick-Cohen and Rotstein.