Dynamics of a degenerate PDE model of epitaxial crystal growth

Abstract:
Epitaxial growth is an important physical process for forming solid films or other nano-structures. It occurs as atoms, deposited from above, adsorb and diffuse on a crystal surface. Modeling the rates that atoms hop and break bonds leads in the continuum limit to degenerate 4th-order PDE that involve exponential nonlinearity and the p-Laplacian with p=1, for example. We discuss a number of analytical results for such models, some of which involve subgradient dynamics for Radon measure solutions and a new notion of weak solutions.