The Numerical Solution of the Phase Field Equations Using Adaptive Moving Meshes

John A Mackenzie
jam@maths.strath.ac.uk
Strathclyde University, Scotland, U.K.

An adaptive moving mesh method is developed for the numerical solution of the phase-field equations. Distinguished limits of these equations include the classical Stefan model, its modification to include surface tension and surface kinetics, and the Cahn-Allen model of motion by mean curvature. The moving mesh method is based on a variational formulation and the governing equations are approximated using a moving finite element method. We will show how the mesh should be clustered to accuratly follow solution interfaces. Numerical results will be given for a planar travelling wave example and anisotropic crystal growth.