Solutions to a three phase-field model for solidification

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February 15, 2021

Abstract

In this paper we present the phase-field models to describe nonisothermal solidification of ideal multicomponent and multiphase alloy systems. Governing equations are developed for the temporal and spatial variation of three phase-field functions, as well as the temperature field. The global existence of weak solutions to parabolic differential equations in three dimension was proved by the Galerkin method. The existence of a maximum theorem are also extensively studied.

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