

# Existence of weak solutions and numerical simulations for a new phase-field model with periodic boundary conditions

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June 6, 2020

## Abstract

This article is concerned with an initial-boundary value problem (IBVP) for a new phase-field model describing the evolution of structural phase transition in elastically deformable solid materials. The model consists of an elliptic-parabolic system in which the displacement field and the order parameter both satisfy periodic boundary conditions. We prove the existence of global solutions to this IBVP by applying the method of continuation of local solutions and perform numerical simulations to investigate the microstructure evolution of MnNi alloys by using this new phase-field model.

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figures/42/42-eps-converted-to.pdf

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