

# Analysis for optimal control of the elastic Allen-Cahn system

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In this talk we describe interface evolution with the help of a phase field approach, while taking elastic effects into account. This theory is used for example to model spinodal decomposition and coarsening in materials science.

Here we discuss the Allen-Cahn system describing the interface evolution, which is extended by some mechanic equations including the elastic effects. Altogether we get a second order semi-linear parabolic equation coupled to an elliptic system. Similar considerations already have been carried out for the related Cahn-Hilliard system.

Moreover, we consider an optimal control problem, where the state equations are given by the elastic Allen-Cahn system. We control the evolution with a forcing-term on a part of the boundary. We start considering first fundamental mathematical questions with respect to this optimal control problem. Eventually, we obtain first order optimality conditions for this optimal control problem.