

Optimal control of multiphase flows (joint work with Harald Garcke, Uni Regensburg und Christian Kahle, TU München)

We consider the optimal control of a two-phase fluid that is described by the thermodynamically consistent diffuse interface model proposed in 2012 by Abels/Garcke/Grün. As key ingredient we present an energy stable simulation scheme proposed by the authors in 2016. It allows us to simulate two-phase fluids in an energy stable way and provides enough regularity to apply classic theory from optimal control. We prove existence of solutions to a semi-discrete in time optimal control problem, and present a convergence analysis for its finite element discretization. We illustrate the performance of our approach with some numerical examples.