

# Towards the Optimal Control of a One-Phase Stefan Problem

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In this talk, we discuss a motion planning problem for a one-phase Stefan problem. This problem class is modeled by a parabolic PDE on a domain with moving boundary. For capturing the moving boundary, level-set techniques are used. In the first part, we present a solver for the direct problem that is based on a discontinuous Galerkin scheme for the level-set equation and the X-FEM method for the approximation of the temperature field. We illustrate the behavior of this solver with a numerical example. In the second part of the talk, optimality conditions for a motion planning problem for a one-phase Stefan problem in level-set formulation will be discussed. The derivation of these techniques is based on optimal shape design tools.

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