

27th IFIP TC7 Conference 2015 on System Modelling and Optimization

Numerical Analysis for PDE-Constrained Optimal Control Problems

**On the regularity of the solutions of Dirichlet optimal control problems in
polygonal domains**

Thomas Apel

Universität der Bundeswehr München, Germany

Thomas.Apel@unibw.de

Abstract: A linear quadratic Dirichlet control problem posed on a possibly non-convex polygonal domain is analyzed. Detailed regularity results are provided in classical Sobolev (Slobodetskii) spaces. Whereas in many other control problems the regularity of the unconstrained solution is better than that of the constrained solution, we encounter here the phenomenon that the constraint inhibits poles of the unconstrained solution. For that reason the regularity of the constrained control is determined by the largest convex angle but the regularity of the unconstrained control is determined by the overall largest angle.

This is joint work with Mariano Mateos (Universidad de Oviedo), Johannes Pfefferer (UniBw München) and Arnd Rösch (Universität Duisburg-Essen).