27th IFIP TC7 Conference 2015 on System Modelling and Optimization

Numerical Analysis for PDE-Constrained Optimal Control Problems

Finite element error estimates for Dirichlet boundary control problems in polygonal domains

Johannes Pfefferer

Universität der Bundeswehr München, Germany

Johannes.Pfefferer@unibw.de

Abstract: This talk is concerned with the discretization error analysis for a linear quadratic Dirichlet control problem in polygonal domains. In order to solve this problem, the state and the control are discretized by piecewise linear and continuous functions on quasi-uniform meshes. Error estimates are discussed which are mainly based on new regularity results for the solution of such problems already presented in the talk by Thomas Apel. As a consequence the quality of the approximations does not only depend on the size of the interior angles but also on the presence of control constraints. Finally, different numerical examples are presented in order to illustrate the theoretical results.

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