JOHANNES KEPLER UNIVERSITY LINZ

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INSTITUTE OF NUMERICAL MATHEMATICS

Talk announcement

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15:30, S2 416-1

Adaptive finite element methods for distributed optimal control problems with state constraints

We consider a distributed optimal control problem constrained by the partial differential equation (PDE) $By = u$, with the goal, to reach a given target y_d with some given accuracy under minimal costs. Assuming that the operator $B : Y \to X^*$ defines an isomorphism, this problem will be analyzed on an abstract level. For a conforming trial space $Y_h \subset Y$ this will lead to quasi optimal estimates for the distance between the computable state $y_h \in Y_h$ and the desired target y_d, depending on the regularity of the target and the cost parameter. The control $u_H \in U_H \subset X^*$ is then reconstructed in a post processing step, for which a rigorous analysis will be given. Moreover, the choice of different, but equivalent, norms for the control and the incorporation of state constraints will be discussed. While this framework applies to a wide class of PDEs, we will consider the Poisson equation as a model problem to apply the proposed methods. Numerical examples, including an adaptive refinement scheme and a discontinuous target, will complement the theory.

This talk is based on joint work with Ulrich Langer (Linz) and Huidong Yang (Wien).