Lothar-Collatz-Kolloquium für Angewandte Mathematik

Donnerstag, den 15. Januar 2015, um 17:15 Uhr, im Hörsaal 5

Prof. Dr. Barbara Kaltenbacher*
(Alpen-Adria-Universität Klagenfurt, Institut für Mathematik)

Adaptive Discretization of Parameter Identification Problems in PDEs

Zusammenfassung/Abstract:

Parameter identification problems for PDEs often lead to large scale ill-posed inverse problems. Hence regularization has to be applied. To reduce the computational effort for the repeated solution of the forward and even of the inverse problem - as it is required for determining an appropriate regularization parameter - recently adaptive discretization strategies have been proposed.

In this talk we will concentrate on the use of goal oriented error estimators, originating from the optimal control of PDEs. This concepts allows to assess the error in a so-called quantity of interest, which is a functional of the control $q$ and the state $u$, and accordingly refine the discretizations of $q$ and $u$ separately and locally. The crucial question for the inverse problem is now how to choose an appropriate quantity of interest. This will be discussed in more detail for variational (Tikhonov) and iterative (Newton type) regularization methods.

Numerical tests will illustrate the efficiency of the proposed methods.

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