



JACOBS
UNIVERSITY

Mathematics Colloquium at Jacobs University Bremen

ANGELA KUNOTH

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will speak on

*Wavelet Methods for PDE-Constrained Control Problems:
Optimal Preconditioners, Fast Iterative Solvers, and Adaptivity*

Date: Monday, April 28, 2008

Time: 17:15

Place: Lecture Hall Research II, Jacobs University

Abstract:

The numerical solution of PDE-constrained control problems requires to repeatedly solve a system of PDEs for the involved variables (state, costate and control). Considering specifically constraints in form of a linear elliptic PDE, we aim at deriving most efficient numerical solution schemes. These schemes will be based on wavelet representations which yield uniformly bounded condition numbers of the system matrices and which, together with nested iteration, provide fast solution schemes of optimal linear complexity on uniform discretizations. A further substantial reduction of complexity can be achieved by introducing adaptivity for solutions exhibiting singularities. For discretizations based on wavelets, we are able to prove convergence of an adaptive scheme together with optimal complexity estimates when compared to the wavelet-best N -term approximation.

Finally, I would like to address PDE-constrained control problems with additional inequality constraints on the control which pose substantial difficulties for deriving fast numerical solution schemes.

Colloquium Tea at ca. 16:45 in the Tea Room of Research II, close to the lecture hall. Everybody is welcome!

M. STOLL