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DK Seminar

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Vienna University of Technology,
Freihaus, green area, 4th floor, 101C

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Adaptive Modeling for Partitioned-Domain Concurrent Multiscale Continuum Models

Joint work with Serge Prudhomme and J. Tinsley Oden

In this contribution I will consider adaptive modeling strategies for the control of modeling errors in so-called partitioned-domain concurrent multiscale models. In these models, the exact fine model is considered intractable to solve throughout the entire domain. It is therefore replaced by an approximate concurrent multiscale model where the fine model is only solved in a small subdomain, and a coarse model is employed in the remainder. I will start with theory of duality-based a posteriori error estimation which is fundamental to controlling errors in quantities of interest. Subsequently, I will present two approaches to adaptively improve approximate models in a general framework assuming the concurrent model is described by continuum models separated by a sharp interface. Several numerical experiments illustrate the strategies.