

Recent Advances in Model and Complexity Reduction for Coupled Problems

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ABSTRACT

Realtime and/or multi-query simulations are typical needs for coupled systems appearing in many real-world scenarios such as engineering (e.g., fluid-structure interaction), plasma physics or climate modeling. Sufficiently fine discretizations for resolving all relevant phenomena often yield computing times excluding realtime or multi-query demands. Therefore, a reduction of the computational complexity is a must.

In this invited session, we will concentrate on recent advances in two reduction techniques, namely the model reduction (e.g. in terms of the Reduced Basis Method, Model Order Reduction, Proper Orthogonal Decomposition etc.) and machine learning methods (deep learning, kernel-based methods, etc.). The aim is to bring experts of both fields together in order to support joint approaches with particular emphasis on coupled problems and the corresponding challenges.