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NUMERICAL MODEL REDUCTION AND DATA-DRIVEN SURROGATES FOR MULTI-PHYSICS APPLICATIONS TRACK NUMBER (700)

RALF JÄNICKE*, FELIX FRITZEN†, MICHEL ROCHETTE♯ AND DAVID RYCKELYNCK♭

* Chalmers University of Technology, Sweden, ralf.janicke@chalmers.se

† University of Stuttgart, Germany, felix.fritzen@mechbau.uni-stuttgart.de

♯ ANSYS France SAS, michel.rochette@ansys.com

♭ Mines ParisTech, France, david.ryckelynck@mines-paristech.fr

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ABSTRACT

Complex computation domains, nonlinear material behaviour and manifold multi-physical coupling phenomena necessitate the solution of high-dimensional systems and the handling of large data sets. Computational resources required to cope with these challenging problems are substantial, particularly in view of ecologic sustainability. In the recent years, the field of model reduction was established in order to render complex simulations both reliable and computationally feasible at the same time. NMR [1], hyper-reduction [2] and related techniques (PGD, DEIM, etc.) are examples which can (partially) eliminate the resource-constraints. Moreover, methods inspired by data science and machine learning, as well as hybrid NMR/data-driven techniques were proposed, e.g., [3].
The mini-symposium addresses computational aspects related but not limited to: Robust, fast and memory efficient surrogate models; error estimation and model adaptivity; solvers for linear and non-linear NMR; greedy procedures; sparse approximation of big data sets; data-assisted predictions; machine learning.

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