

PROPOSAL FOR A MINISYMPOSIUM FOR
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Applications of Goal-Oriented Error Estimation and Adaptivity

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Error estimation and adaptation in Computational Sciences and Engineering aim at developing efficient methods to assess the accuracy of computer simulations and to design optimal adaptive strategies for reliable predictions of physical phenomena. Defining optimal meshes is therefore of paramount importance for reducing computational costs. Today, the topic also extends beyond classical discretization error assessment and mesh refinement. It also encompasses adaptive modeling with the objective of adaptively enriching surrogate models that can arise from concurrent coupling techniques, model reduction, or response surface techniques, models which are particularly useful in the context of multi-query simulations for uncertainty analysis or design optimization. It further involves novel topics relevant to engineering applications, including goal-oriented methods for the control of errors in quantities of interest, the calculation of error bounds for a large class of physical problems, the control of errors in uncertainty analyses, etc.

The objectives of the mini-symposium will be to present the latest contributions to goal-oriented error estimation and adaptive methods. We anticipate talks on the following topics:

- Estimation of discretization and modeling errors for nonlinear or time-dependent problems;
- Control of errors in Multiphysics and Multiscale problems;
- Adaptive approaches in model reduction techniques;
- r-adaptivity based on optimization formulations, moving mesh methods, or optimal transport;
- Stability, convergence, and optimality analysis of adaptive methods;
- Error estimation and adaptive schemes for uncertainty quantification;
- Use of machine learning techniques for error estimation and adaptivity; etc.

Those interested are welcome to contribute to the mini-symposium with an abstract.