Parameter identification for high-fidelity simulation

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Abstract

In this paper, modeling parameters are systematically classified according to high-fidelity modeling requirements, and a normalized modeling process of high-fidelity simulation is proposed. Meanwhile, several parameter identification techniques including global sensitivity analysis, regularization for high-fidelity modeling, hybrid computational inverse algorithms, and uncertainty invers analysis methods are developed for high-fidelity modeling. Four engineering applications are presented to demonstrate the feasibility and efficiency of these parameter identification techniques and high-fidelity modeling process.

Keywords: Parameter Identification, High-fidelity Simulation, Global Sensitivity Analysis, Regularization, Computational inverse, Uncertainty.