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ADVANCEMENTS IN MODEL REDUCTION, DATA ASSIMILATION, AND UNCERTAINTY QUANTIFICATION FOR COMPLEX PHYSICAL SYSTEMS

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MINISYMPOSIUM

High-fidelity simulations have become indispensable in design and analysis of complex physical systems. However, these simulations present two major challenges for real-world applications: 1. they remain computationally expensive and infeasible for many-query upstream tasks such as optimization and uncertainty quantification; and 2. the ability of these simulations to accurately describe physical phenomena, such as transient and chaotic dynamics, is limited and accompanied with high uncertainties. In this regard, recent progress in data-driven methods for complex physical systems is receiving growing attention as a potential path to address these two major challenges. This mini-symposium focuses on challenges, advances, and prospects in model reduction, data assimilation, and uncertainty quantification for complex physics problems and will provide a platform for discussion and interaction between researchers working on different aspects of the techniques.