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MODEL REDUCTION AND SCIENTIFIC MACHINE LEARNING IN COMPUTATIONAL FLUID DYNAMICS

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ABSTRACT

This mini-symposium aims to create a dynamic forum for exchanging ideas, best practices, and recent advancements in integrating scientific machine learning (SciML) and model reduction techniques within the computational fluid dynamics (CFD) field. As emerging information technologies continue accelerating the convergence of simulation tools, high-performance computing (HPC), and SciML, this event provides a unique opportunity for researchers, practitioners, and industry leaders to stay at the forefront of these innovations.

The mini-symposium will cover a broad range of topics, including but not limited to:

- Computational environments and frameworks that support advanced scientific machine learning and large-scale engineering simulations.
- Large-scale model reduction and machine learning strategies in high-performance computing.
- Enabling software technologies that drive breakthroughs in CFD applications.
- Development of specialized software libraries for SciML and model order reduction.
- Integration of data science techniques in CFD workflows.
- Supporting tools for performance evaluation, visualization, verification, and validation.
- Theoretical foundations, methodologies, and algorithms that advance scientific workflows and push the boundaries of computational fluid dynamics.

By fostering a collaborative environment, this mini-symposium aims to highlight the transformative role of model order reduction and scientific machine learning in shaping the future of CFD. Attendees will gain valuable insights into the latest software, algorithms, and computational methodologies advancements, positioning themselves at the cutting edge of this rapidly evolving field.