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THEORY AND APPLICATION OF PROVABLY-ROBUST AND EFFICIENT HIGH-ORDER METHODS FOR HIGH-FIDELITY COMPUTATIONAL FLUID DYNAMICS

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MINISYMPOSIUM

The objective of this minisymposium is to bring together researchers working on discretizations of nonlinear partial differential equations (PDEs) with provable properties such as nonlinear stability with an emphasis on robust schemes and applications towards industrial strength cases. The focus will be on the use of high-order methods for high-fidelity simulations; where traditionally the stated methods have suffered from lack of stability and efficiency. In this minisymposium, we look broadly at nonlinear PDEs and the mathematics required to develop efficient high-order schemes with provable properties. Example PDEs of interest include but are not limited to, incompressible and compressible flow equations, multiphase equations, nonlinear wave equations, and nonlinear reaction diffusion equations. The sessions will be scheduled in such a manner where the first one or two sessions will present state-of-the-art development on topics related to, for example, nonlinear stability, postitivity preserving, time-integration, and shock-capturing; while the subsequent sessions will present research on the application of such methods on industrial-relevant cases.