

POD Reduced-Order Modeling of Complex Fluid Flows

Zhu Wang, University of South Carolina

Computational efficiency is of paramount importance in many scientific and engineering applications such as flow control and optimization problems. Model reduction techniques are frequently used to generate a surrogate offline for achieving fast online simulations. To balance the low computational cost required by a reduced-order model and the complexity of the target flows, appropriate closure modeling strategies need to be applied. In this talk, we present reduced-order modeling strategies synthesizing ideas originating from proper orthogonal decomposition and large eddy simulation, develop error estimates and discuss efficient numerical algorithms for implementations.