Boulder Fluid and Thermal Sciences Seminar Series

Tuesday, September 13, 2016, 3:30pm-4:30pm (refreshments at 3:15pm)
Bechtel Collaboratory in the Discovery Learning Center (DLC)
University of Colorado, Boulder

Introduction to Problems in Computational Aeroelasticity

Adam Jirasek, *University of Colorado, Boulder*

Computational aeroelasticity is a dynamic area of research relevant to a wide range of aerospace systems and problems. In this presentation, an overview of research challenges associated with computational aeroelasticity will be provided through demonstrations of various test cases. The focus of the presentation is to illustrate problems that might be encountered by a researcher who is active in computational aeroelasticity, including time synchronization of separately run solvers and issues with turbulence modeling for separated flows around elastic configurations. Recent progress in extending aeroleastic modeling from a modal-based approach to fully coupled non-modal based approach will be outlined.

Parameter Estimation for a Turbulent Buoyant Jet Using Approximate Bayesian Computation

Jason Christopher, *University of Colorado, Boulder*

Approximate Bayesian Computation (ABC) is a powerful tool that allows sparse experimental or other “truth” data to be used for the prediction of unknown model parameters in numerical simulations of real-world engineering systems. In this presentation, I first introduce the ABC approach. I then use ABC to predict unknown inflow conditions in simulations of a two-dimensional (2D) turbulent, high-temperature buoyant jet. For this test case, “truth” data are obtained from a simulation with known boundary conditions and problem parameters. Using spatially- sparse temperature statistics from the 2D buoyant jet “truth” simulation, I show that the ABC method provides accurate predictions of the “true” jet inflow temperature. The success of the ABC approach in the present test suggests that ABC is a useful and versatile tool for engineering fluid dynamics research.