Boulder Fluid Dynamics Seminar Series

Tuesday, September 30, 2014
3:30pm-4:30pm (refreshments at 3:15pm)
Bechtel Collaboratory in the Discovery Learning Center (DLC)
University of Colorado at Boulder

Study, Implementation, and Testing of Active Flow Control

John Farnsworth, *University of Colorado Boulder*

A survey of projects conducted by the presenter in the field of active flow control and the future plans for continuing similar research at the University of Colorado Boulder (CU) will be presented. Specifically three projects will be briefly discussed. (1) Controlling the local boundary layer characteristics on the Stingray UAV at low angles of attack using synthetic jet actuators. (2) Controlling the fore-body vortices that form on a slender axisymmetric body at high angles of attack through dielectric barrier discharge plasma actuators. (3) Current work and future plans to intelligently control stall flutter on high aspect ratio flexible wings. Finally, the presentation will conclude with a brief discussion of the presenter's plans for assembling a new experimental aerodynamic testing laboratory at CU; including a moderate scale open-return low-speed wind tunnel and the supporting measurement equipment. The presenter envisages this laboratory as significant asset to the local fluids community because of the potential it brings for future collaborations.

Evaluating wind plant controls concepts using SOWFA

Paul Fleming, *National Renewable Energy Laboratory*

Wind plant controls is an active field of research in which the global performance of a wind plant is improved by coordinating the control of individual wind turbines. Various strategies have been put forward to achieve this improvement. In this presentation, we review our investigations into wind plant control using the Simulator for Wind Farm Applications (SOWFA). SOWFA is an open-source tool developed at the National Wind Technology Center which couples the OpenFOAM CFD toolbox with NREL's FAST wind turbine simulator. Techniques investigated include pitch and torque control, yaw and tilt control, and turbine repositioning.