Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Active Control of Stationary Vortices.[1] GIOVANNI NINO, Quest Integrated LLC, ROBERT BREIDENTHAL, ADITI BHIDE, ADITYA SRIDHAR, University of Washington — A system for active stationary vortex control is presented. The system uses a combination of plasma actuators, pressure sensors and electrical circuits deposited on aerodynamic surfaces using printing electronics methods. Once the pressure sensors sense a change on the intensity or on the position of the stationary vortices, its associated controller activates a set of plasma actuator to return the vortices to their original or intended positions. The forces produced by the actuators act on the secondary flow in the transverse plane, where velocities are much less than in the streamwise direction. As a demonstration case, the active vortex control system is mounted on a flat plate under low speed wind tunnel testing. Here, a set of vortex generators are used to generate the stationary vortices and the plasma actuators are used to move them. Preliminary results from the experiments are presented and compared with theoretical values.

[1]Thanks to the USAF AFOSR STTR support under contract FA9550-15-C-0007

Robert Breidenthal
University of Washington

Date submitted: 02 Aug 2016 Electronic form version 1.4