Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Plasma Streamwise Vortex Generators in an Adverse Pressure Gradient CHRISTOPHER KELLEY, THOMAS CORKE, FLINT THOMAS, University of Notre Dame — A wind tunnel experiment was conducted to compare plasma streamwise vortex generators (PSVGs) and passive vortex generators (VGs). These devices were installed on a wing section by which the angle of attack could be used to vary the streamwise pressure gradient. The experiment was performed for freestream Mach numbers 0.1–0.2. Three-dimensional velocity components were measured using a 5-hole Pitot probe in the boundary layer. These measurements were used to quantify the production of streamwise vorticity and the magnitude of the reorientation term from the vorticity transport equation. The effect of Mach number, pressure gradient, operating voltage, and electrode length was then investigated for the PSVGs. The results indicate that the PSVGs could easily outperform the passive VGs and provide a suitable alternative for flow control.

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Date submitted: 01 Aug 2013 Electronic form version 1.4