

Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Active flow control over a finite wing. Part 1: Experimental investigation¹ JOSHUA WOOD, MICHAEL AMITAY, KENNETH JANSEN, Rensselaer Polytechnic Institute — The effect of active flow control, via arrays of synthetic jet actuators, on the flow field around a finite wing was investigated experimentally and numerically. In the present abstract, the experimental component is discussed. To fully and properly implement flow control, a fundamental understanding of the interaction of the synthetic jets with the three-dimensional cross flow must be possessed. The experiments were conducted in a wind tunnel on a finite wing having a cross-sectional profile of NACA 4421 at a wide range of angles of attack, Reynolds numbers, and several arrangements of synthetic jets. Stereoscopic PIV data were collected in conjunction with dynamic surface pressure. Using these data, the complex 3-D interactions were analyzed to form a cohesive understanding of the parameters that may impact the effectiveness of flow control on 3-D configurations.

¹Supported by AFOSR.

Michael Amitay
Rensselaer Polytechnic Institute

Date submitted: 30 Jul 2008

Electronic form version 1.4