

Abstract Submitted
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Performance Envelope of Flow Velocity Induced by a Single OAUGDP[®] Electrohydrodynamic (EHD) Plasma Actuator¹ J. REECE ROTH, XIN DAI², University of Tennessee — Electrohydrodynamic (EHD) plasma actuators using the One Atmosphere Uniform Glow Discharge Plasma (OAUGDP[®]) are emerging as a promising aerodynamic flow control technology.¹ It has been found that a single plasma actuator on the leading edge of a NACA-0015 airfoil increased its stall angle from 15° to 21° at free-stream flow velocities up to 75 m/s,² promising flow control applications at aircraft take-off and landing speeds. We are conducting a research program to maximize the induced flow velocity and minimize the power consumption of plasma actuators by adjusting the electrode width, width ratio, gap distance, dielectric thickness, and dielectric material.³ In this paper, we report the induced flow velocity and input power to the actuator as functions of the dielectric material, and RF voltage and frequency. We find that quartz and Teflon are superior dielectric materials. ¹J. R. Roth: *Physics of Plasmas*, Vol. 10, No. 5 (2003). ²D.F. Opaitis et al., 43rd AIAA Aerospace Sciences Meeting Reno, NV, January 10-14, 2005. ³J. R. Roth, Xin Dai, Jozef Rahel, and D. M. Sherman, 43rd AIAA Aerospace Sciences Meeting Reno, NV, January 10-14, 2005

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