

Abstract Submitted  
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**Pressure Dependence of Plasma Actuated Flow Control** JOSEPH VALERIOTI, THOMAS CORKE, University of Notre Dame — An experimental investigation was conducted to determine how Single Dielectric-Barrier Discharge (SDBD) plasma actuators performed under variable ambient pressure. The static pressure was varied from 0.17 to 9.0 bar. The plasma initiation voltage and static thrust were measured and compared to similar data in literature. The results showed that at a given pressure, the plasma initiation voltage scaled with the actuator capacitor per unit area. The measured thrust showed the previously observed power-law relation with voltage, but the exponent varied with pressure. These trends were evaluated against simulations from the SDBD Space-Time Lumped Element Model. Parameters in the model affected by ambient pressure (capacitance, resistance, and Debye length of the air) were then systematically investigated to determine their effects on the plasma-produced body force. The overall trends were best modeled through a pressure dependence of the Debye length.

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