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Experimental study and optimization of Plasma Actuators for Flow control in subsonic regime PRADEEP MOISE, JOSEPH MATHEW, KARTIK VENKATRAMAN, JOY THOMAS, Indian Institute of Science, FLOW CONTROL TEAM — The induced jet produced by a dielectric barrier discharge (DBD) setup is capable of preventing flow separation on airfoils at high angles of attack. The effect of various parameters on the velocity of this induced jet was studied experimentally. The glow discharge was created at atmospheric conditions by using a high voltage RF power supply. Flow visualization, photographic studies of the plasma, and hot-wire measurements on the induced jet were performed. The parametric investigation of the characteristics of the plasma show that the width of the plasma in the uniform glow discharge regime was an indication of the velocity induced. It was observed that the spanwise and streamwise overlap of the two electrodes, dielectric thickness, voltage and frequency of the applied voltage are the major parameters that govern the velocity and the extent of plasma. The effect of the optimized configuration on the performance characteristics of an airfoil was studied experimentally.

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