

Abstract Submitted  
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**Flow Separation Control over a High-lift Airfoil using Multiple DBD Plasma Actuators**<sup>1</sup> JESSE LITTLE, MUNETAKE NISHIHARA, IGOR ADAMOVICH, MO SAMIMY, The Ohio State University — This work continues an ongoing experimental study on the efficacy of plasma actuators for controlling flow separation on a high-lift airfoil. Previous results showed that a single dielectric barrier discharge (DBD) plasma actuator at the shoulder of a simple trailing edge flap can be effective for enhancing lift by increasing momentum transport between the freestream and separated region through amplification of large-scale structures at low frequencies. This work examines the ability of multiple actuators to further generate and amplify flow structures using pulsed actuation with variable phase. Multiple actuators are also operated at high frequency in an effort to reattach the separating boundary layer with quasi-steady plasma induced flow. Results show that low frequency pulsed forcing requires less power input and generates greater lift increases than high frequency actuation, but has a penalty of increased fluctuating pressure loads on the flap. These studies constitute necessary steps in the development and implementation of plasma actuators for control of flow separation at velocities associated with take-off and landing applications in transport aircraft.

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