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Separation Control from the Flap of a High-Lift Airfoil Using DBD Plasma Actuators[1] JESSE LITTLE, MUNETAKE NISHIHARA, IGOR ADAMOVICH, MO SAMIMY, The Ohio State University — Control of separation from the flap of a high-lift airfoil using a single dielectric barrier discharge (DBD) plasma actuator has been investigated experimentally. This project is motivated by the desire to replace existing multi-element flap configurations with a single simple flap to allow more efficient high-lift generation. The results show that a single DBD plasma actuator located at the flap shoulder can increase or reduce the size of the time-averaged separation bubble over the flap depending on the frequency of actuation. In the latter case, the lift on the airfoil is increased due to improved circulation around the model, but it does not result in full reattachment on the deflected flap. These findings are consistent with previous research on high-lift airfoil configurations. The work will be expanded by exploring the effect of multiple actuators as well as their geometry and location on the size and structure of the separated region over the flap. This portion of the work will be done with an emphasis on optimizing the relative phase of each actuator and its effect on the separated flow region.

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