

Abstract Submitted
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Ac-DBD vs Ns-DBD Plasma Actuation on a Turbulent Mixing Layer ASHISH SINGH, JESSE LITTLE, University of Arizona — A parametric study is undertaken to compare ac-DBD (momentum) and ns-DBD (thermal) plasma actuators in a low speed turbulent mixing layer using an identical load. The mean flow response to each actuation technique is matched at a fixed downstream location. The imposed equivalence in local control authority between the two actuators extends to the global flow, both in the mean and fluctuating components. The ns-DBD plasma actuator requires six times more energy to achieve the same control as the ac-DBD in this specific flow. By studying the flow field very near the splitter plate trailing edge, the difference in momentum versus thermal actuation mechanisms is revealed. A velocity deficit is observed for both actuators, but a thermal bump-like mechanism is responsible in the ns-DBD case while a near surface jet redirecting momentum is found in the ac-DBD case.

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