

Abstract Submitted
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S-Duct Engine Inlet Flow Control Using SDBD Plasma Streamwise Vortex Generators¹ CHRISTOPHER KELLEY, CHUAN HE, THOMAS CORKE, University of Notre Dame — The results of a numerical simulation and experiment characterizing the performance of plasma streamwise vortex generators in controlling separation and secondary flow within a serpentine, diffusing duct are presented. A no flow control case is first run to check agreement of location of separation, development of secondary flow, and total pressure recovery between the experiment and numerical results. Upon validation, passive vane-type vortex generators and plasma streamwise vortex generators are implemented to increase total pressure recovery and reduce flow distortion at the aerodynamic interface plane: the exit of the S-duct. Total pressure recovery is found experimentally with a pitot probe rake assembly at the aerodynamic interface plane. Stagnation pressure distortion descriptors are also presented to show the performance increase with plasma streamwise vortex generators in comparison to the baseline no flow control case. These performance parameters show that streamwise plasma vortex generators are an effective alternative to vane-type vortex generators in total pressure recovery and total pressure distortion reduction in S-duct inlets.

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