Abstract Submitted
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Flow Topology and Control of a Closed Separation Domain Over a Curved Surface[1] C.J. PETERSON, N.K. KOUKPAIZAN, B. VUKASINOVIC, M.J. SMITH, A. GLEZER, Georgia Institute of Technology — The unsteady interactions between fluidic oscillating jets and the vorticity concentration within a separation bubble formed by a subsonic cross flow over a curved surface is investigated experimentally. The nominally 2-D curved surface is designed to promote separation representative of that seen in rotorcraft applications. A spanwise array of fluidic oscillating jets located upstream of the separation provides dissipative, high-frequency actuation, which in turn controls the characteristic scale of the separation domain. The effect of the actuation and its progression from the upstream to the downstream edges of the separated bubble are assessed using stereoscopic particle image velocimetry. Emphasis is placed on local entrainment and flow features near the actuators and their ensuing downstream progression throughout the separated region. Additionally, the relationship between the local flow features at separation and characteristics of the ensuing separated flow will be assessed with respect to the global flow control effectiveness.

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