

Abstract Submitted
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Investigation of the Acoustic Properties of Supersonic Jets with Fluidic Injection on Chevrons: Experimental Results¹ DAVID MUNDAY, NICK HEEB, University of Cincinnati, EPHRAIM GUTMARK, University of Cincinnati, JUNHUI LIU, K. KAILASANATH, Naval Research Laboratory — An experimental investigation of two jet noise reduction techniques is presented. These techniques are currently employed on commercial aircraft, and we now apply them to a convergent-divergent nozzle with geometry typical of military aircraft. The acoustic effects of chevrons and fluidic injection on chevrons are quantified by Near-Field and Far-Field acoustic measurements. Experimental tests are shown for overexpanded, underexpanded, and on design nozzle pressure ratios to simulate the entire flight envelope of a military aircraft. In nearly all cases chevrons are shown to reduce noise and eliminate screech tones. Adding fluidic injection to chevrons shows additional far-field noise reduction for underexpanded conditions. This presentation is the experimental portion of a joint numerical/experimental program.

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