

Abstract Submitted
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Aero-Effected Flight Control Using Distributed Active Bleed¹

JOHN M. KEARNEY, ARI GLEZER, Georgia Institute of Technology — The aerodynamic effects of large-area air bleed that is driven through surface openings in a lifting airfoil by pressure differences are investigated in wind tunnel experiments. The bleed is actively regulated by arrays of addressable integrated louvers, and the time-dependent interactions between the bleed and cross flows alter the apparent aerodynamic shape of the lifting surface, and, consequently, the distributions of aerodynamic forces and moments. The 2-D Clark-Y wind tunnel model is oscillating in pitch, and the dynamic changes in the time-dependent forces and moment are measured over a wide range of angles of attack from pre- to post-stall using integrated load cells. Induced changes in surface vorticity concentrations are measured using PIV with emphasis on the effects of leading edge bleed at high angles of attack on the evolution of the dynamic stall vorticity concentrations.

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