

Abstract Submitted  
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**Aerodynamic Control using Distributed Active Bleed**<sup>1</sup> JOHN M. KEARNEY, GEORGE T.K. WOO, ARI GLEZER, Georgia Institute of Technology — Aero-effected control of lifting surfaces using distributed active bleed driven by surface pressure differences and regulated by integrated louver actuators is investigated in wind tunnel experiments. The interaction between the bleed and cross flows alters the apparent aerodynamic shape of the lifting surface and consequently the distributions of forces and moments. A modular wind tunnel model based on a Clark-Y airfoil is mounted on high-resolution isolated load cells and is equipped with independently-controlled surface louvers on the pressure and suction sides near the leading edge. The louvers are activated using integrated SMA actuators that enable time-dependent actuation. Measurements of time-resolved forces and moment show that the actuation leads to significant changes in the lift force and pitching moment over a range of angles of attack. Phase-locked PIV shows the effects of the bleed on the flow on the suction surfaces and the corresponding changes in the near wake.

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John M. Kearney  
Georgia Institute of Technology

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