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Interaction of Finite-span Synthetic-jets with a Cross-flow over a Swept Wing JOSEPH VASILE, MICHAEL AMITAY, Rensselaer Polytechnic Institute — The formation of secondary flow structures due to the interaction of three finite span synthetic jets with a cross-flow was investigated experimentally over a finite sweptback wing (cross-sectional profile of the NACA 4421) at a Reynolds number of 100,000. Stereoscopic PIV data were collected across the three jets in the wing's mid-span section, where the effect of the jets' location, and their blowing ratio were analyzed based on the three-dimensional flow field using time-averaged and phase-averaged statistics. The arrangement of synthetic jets was investigated through the use of varying actuation combinations in order to fully understand the interaction of the three jets with the cross flow. In the present study, an angle of attack of 13.5deg was chosen for the model, in which the boundary layer was attached in the vicinity of the middle synthetic jet and partially separated in the vicinity of the jet closer to the wing tip. The present work confirmed the previous findings of the presence of secondary tilted flow structures.

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