

Abstract Submitted
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The Pressure Disturbance Produced by an Oscillating Fence on a Pitch Oscillating Wing¹ MANJINDER SAINI, WILLIAM LINDBERG, JONATHAN NAUGHTON, University of Wyoming — The ability of an oscillating fence to produce changes in the pressure distribution on a pitch-oscillating NACA 23012 wing is studied using time-resolved pressure measurements and Particle Image Velocimetry (PIV). The fence is located at 35% of chord, and the effect of fence Strouhal numbers is studied by varying the fence frequency between 20 and 80 Hz. The fence is tested under three different oscillation conditions with mean angles of attack of -5, 0 and +3 degrees and a pitch oscillation range of ± 5 degrees about the mean angle. The oscillating fence actuator produces a large vortical structure that induces large changes in the unsteady pressure distribution. The implication of these vortical disturbances for flow control is important because the local pressure changes produced are largely independent of the angle of attack during oscillation. However, all the cases studied show that the vortical structures and the resulting pressure disturbances are a function of the fence frequency. The experiments also indicate that the overall effect of fence for one complete oscillation cycle is a strong function of mean angle of oscillation.

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Jonathan Naughton
University of Wyoming

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