

TRANSONIC FLOW EXPERIMENTS WITH A 2-D RECTANGULAR WING SECTION OSCILLATING IN PITCH

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Abstract

The interaction of aerodynamic and structural forces on a 2-D rectangular wing section in transonic flow oscillating in pitch is studied experimentally. Emphasis is placed upon flow induced excitation of pitching motion by transient separated flow regions and local shocks. Unsteady forces and surface pressures are determined on the oscillating rectangular rigid wing model for different amplitudes at mean incidence angles of zero to two degrees and at Mach numbers of about 0.50 up to 0.75. The investigations include measurements with free oscillation due to shock oscillations and shock induced flow separation for different initial conditions. The crosssection of the wing model is given by a supercritical BAC-airfoil, which has a relative thickness of 11% at 39% of chord length.