

Aerodynamic and Aeroacoustic Properties of a Flatback Airfoil: An Update

Matthew F. Barone*, Dale Berg†
Sandia National Laboratories
Albuquerque, NM 87185

Results from an experimental study of the aerodynamic and aeroacoustic properties of a flatback version of the TU Delft DU97-W-300 airfoil are presented for a chord Reynolds number of 3×10^6 . The data were gathered in the Virginia Tech Stability Wind Tunnel, which uses a special aeroacoustic test section to enable measurements of airfoil self-noise. Corrected wind tunnel aerodynamic measurements for the DU97-W-300 are compared to previous solid wall wind tunnel data and are shown to give good agreement. Aeroacoustic data are presented for the flatback airfoil, with a focus on the amplitude and frequency of noise associated with the vortex-shedding tone from the blunt trailing edge wake. The effect of a splitter plate attachment on both drag and noise is also presented. Computational Fluid Dynamics predictions of the aerodynamic properties of both the unmodified DU97-W-300 and the flatback version are compared to the experimental data.