

Abstract Submitted
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An Experimental Study of Airfoil Self-Noise DANIEL W. SHANNON, SCOTT C. MORRIS, MARK ROSS, University of Notre Dame — The acoustic signature of airfoils at low Mach number is typically dominated by noise generated at the trailing edge. This “self-noise” is dipole-like in nature, and results from the scattering of the turbulent pressure fluctuations in proximity to a sharp edge. Predicting the radiated sound requires a detailed understanding of the stochastic properties of the turbulence, as well as knowledge of the acoustic Green’s function for a particular geometry. The present research has focused on the direct measurement of edge scattering acoustics for a number of geometries. The experiments were conducted in an Anechoic Wind Tunnel using a pair of 40 microphone phased arrays. The test specimens include compact and non-compact airfoils, circular cylinders, blunt and sharp trailing edges, and a blown slot edge used for circulation control. The discussion will focus on the comparison of the various results in order to derive an improved understanding of the sound generation physics.

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