

Abstract Submitted
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Modeling Unsteady Lift and Radiated Sound Generated by a 2-D Airfoil in an Intermittent Flow MARK ROSS, SCOTT MORRIS, University of Notre Dame — The spanwise correlation length scale of lateral velocity and the gust response function are the quantities of interest in predicting the sound production from an airfoil. Typically, these quantities are taken to be a correlation length scale model based on isotropic turbulence and Sears' gust response function, respectively. The present study is an experimental investigation of the accuracy of these selections when the turbulent approach flow is intermittently irrotational. Acoustic measurements of a flat-plate airfoil placed at three lateral locations in a single stream shear layer are presented. The acoustic measurements are compared to radiated sound predictions based on detailed velocity field measurements. A potential model which accounts for the effect of approach flow intermittency on the radiated sound will also be presented.

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