Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

An experimental investigation of the shear-layer and acoustic sources produced by a leading edge slat[1] STEPHEN WILKINS, PATRICK RICHARD, JOSEPH HALL, University of New Brunswick, TURBULENCE AND FLOW NOISE LABORATORY TEAM — Leading edge slats are a common addition to airfoils as part of a high lift configuration employed during take-off and landing; the unsteady flow caused by these slats is a major contributor to the overal airframe noise. As the next generation of aircraft seeks to reduce these noise concerns, a better understanding of the sources of aeroacoustic noise generation is sought. Particle Image Velocimetry (PIV) and simultaneous multipoint measurements of the unsteady surface pressure are used herein to investigate the unsteady flow around a leading edge slat coupled with an airfoil for several different configurations and a range of Reynolds numbers ($Re = 156,000$ to $Re = 1.2$ million based on the wing chord). Shear-layer development off the slat cusp and the related unsteady vortex structures are examined in detail to better establish and understand the mechanisms responsible for the generation of aeroacoustic slat noise.

[1]The authors are grateful for the support provided by GARDN.

Joseph Hall
University of New Brunswick

Date submitted: 24 Jul 2013 Electronic form version 1.4