Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Experimental evaluation of sound produced by two cylinders in a cross flow in various configurations MICHAEL BILKA, PETER KERRIAN, SCOTT MORRIS, University of Notre Dame — Cylinders in a cross flow is a canonical test case that is considered representative of industrial fluid flow problems, such as heat exchangers and aircraft landing gear. The general configurations are cylinders in tandem, parallel or staggered, which lead to several interesting flow phenomena such as wake cavity/wake interaction effects (tandem), symmetric/asymmetric wake behavior (parallel) or wake interaction/coanda effects (staggered), depending on relative location of the cylinders. In many cases, it is important to not only understand the flow interaction between the cylinders but also the acoustic consequence of such configurations. However, information on the acoustical behavior based on these configurations is relatively small compared to that of the steady aerodynamic and flow interaction behavior. The present work investigates the acoustic spectral properties of these configurations in order to characterize the sound produced by cylinder proximity and wake effects. The spectra are measured using an acoustic beam-forming technique to identify the sources and remove spurious content from the spectra.

Michael Bilka
University of Notre Dame

Date submitted: 02 Aug 2012 Electronic form version 1.4