

Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Noise prediction from external flows using Ffowcs-Williams and Hawkings techniques¹ ZANE NITZKORSKI, KRISHNAN MAHESH, University of Minnesota — We investigate noise production from turbulent flow using the Ffowcs-Williams and Hawkings (FWH) acoustic analogy for general hydrodynamic flow configurations. We describe our methodology of using porous implementations of the FWH equations to calculate far-field sound from sources that are computed by either incompressible or compressible LES/DNS. We discuss a novel endcap methodology for the quadrupole source terms. The methodology allows for estimation of volumetric noise computed over a small volume as opposed to the common approach of ignoring the entire volume term while providing fewer limitations on the propagation function. We compute the noise from cylinders at various Reynolds' numbers ($Re = 150, 10k, 89k$) and trailing edge configurations and compare our results, base flow as well as acoustic data, to available computations and experiments.

¹This work is supported by the Office of Naval Research

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Date submitted: 01 Aug 2013

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