

Abstract Submitted  
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**Noise prediction from external flows using Ffowcs-Williams and Hawkings techniques**<sup>1</sup> 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. Details of the development including arbitrary surface extraction techniques on unstructured grids and a novel end-cap correction for the quadrupole sound will be presented. 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. We have used these techniques to compute the noise from high Reynolds number cylinder flows and compare our results against available computations and experiments; base flow results as well as acoustic data will be compared.

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