

Far-Field Noise Prediction of Tandem Cylinders Using Incompressible Large Eddy Simulation

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Abstract : A three-dimensional incompressible Large Eddy Simulation (LES) is performed to compute the hydrodynamic field around a pair of tandem cylinders. Symmetry-preserving schemes will be used during this simulation in conjunction with Finite Volume Method (FVM) to obtain the hydrodynamic field around the selected geometry. A set of results consisting of pressure and velocity and the combination of them will be stored at different surfaces near the cylinders as the initial input for the second part of the study. A post-processing of the obtained results based on Ffowcs-Williams and Hawkings (FWH) equation with a Fourier Transform of the acoustic sources will be used to compute noise at several probes located far away from the region where the hydrodynamics are computed. Directivities as well as spectral profile of the obtained acoustic field will be analyzed.

Keywords : far-field noise, Ffowcs-Williams and Hawkings, finite volume method, large eddy simulation, long-span bodies

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