Large-eddy simulation of propeller noise\textsuperscript{1} JACOB KELLER, KRISHNAN MAHESH, Univ of Minnesota - Twin Cities  — We will discuss our ongoing work towards developing the capability to predict far field sound from the large-eddy simulation of propellers. A porous surface Ffowcs-Williams and Hawkings (FW-H) acoustic analogy, with a dynamic endcapping method (Nitzkorski and Mahesh,2014) is developed for unstructured grids in a rotating frame of reference. The FW-H surface is generated automatically using Delaunay triangulation and is representative of the underlying volume mesh. The approach is validated for tonal trailing edge sound from a NACA 0012 airfoil. LES of flow around a propeller at design advance ratio is compared to experiment and good agreement is obtained. Results for the emitted far field sound will be discussed.


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