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JET NOISE SIMULATION USING HIGHER-ACCURACY NOT-DG METHOD ON UNSTRUCTURED MESHES

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The paper is devoted to turbulent jet simulation using hybrid scale-resolving approaches with the recent modification to accelerates RANS-to-LES transition in shear layers [1]. The postprocessing analysis of jet aeroacoustics is performed based the integration method of Ffowcs-Williams Hawkings (FWH). Immersed unheated subsonic and hot sonic underexpanded round jets are considered on "classical" anisotropic multi-block curvilinear structured and fully unstructured meshes using the same "unstructured" algorithm.

We use a different from Discontinuous Galerkin (DG) higher-accuracy method on unstructured meshes. It is referred to EBR (Eged-Based Reconstruction) schemes [2] which provide accuracy not higher than of the second order on arbitrary unstructured meshes within finite-volume approach and reduce to a high-order finite-difference method on translationally-invariant meshes. Shock capturing treatment is provided by the WENO extension of EBR schemes [3]. All the numerical techniques are implemented in the in-house code NOISEtte.

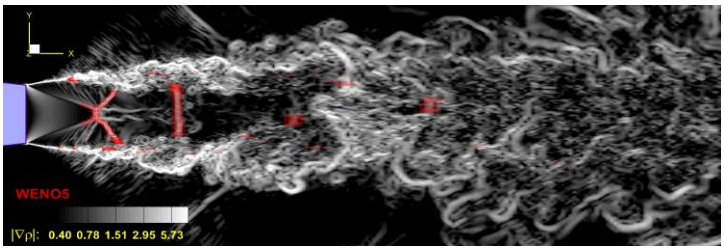

Fig. 1. Instantaneous field of underexpanded hot jet.

The research is focused at investigation of the numerical algorithm capabilities to predict jet noise on unstructured tetrahedral meshes. The assessment is based on the comparison of results against the experimental and reference numerical data with account for accuracy and computational costs.

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