Abstract Submitted
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**On the accuracy of simulations of a 2D boundary layer with RANS models implemented in OpenFoam**[1] BENJAMIN J. GRAVES, SEBASTIAN GOMEZ, SVETLANA V. POROSEVA, University of New Mexico — The OpenFoam software is an attractive Computational Fluid Dynamics solver for evaluating new turbulence models due to the open-source nature, and the suite of existing standard model implementations. Before interpreting results obtained with a new model, a baseline for performance of the OpenFoam solver and existing models is required. In the current study we analyze the RANS models in the OpenFoam incompressible solver for two planar (two-dimensional mean flow) benchmark cases generated by the AIAA Turbulence Model Benchmarking Working Group (TMBWG): a zero-pressure-gradient flat plate and a bump-in-channel. The OpenFoam results are compared against both experimental data and simulation results obtained with the NASA CFD codes CFL3D and FUN3D. Sensitivity of simulation results to the grid resolution and model implementation are analyzed. Testing is conducted using the Spalart-Allmaras one-equation model, Wilcox's two-equation k-omega model, and the Launder-Reece-Rodi Reynolds-stress model. Simulations using both wall functions and wall-resolved (low Reynolds number) formulations are considered.

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