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Partially-Averaged Navier-Stokes for Computations of Flow Around Three-Dimensional Ahmed Bodies

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Abstract : The paper reports a study about the prediction of flows around simplified vehicles using Partially-Averaged Navier-Stokes (PANS). Numerical simulations are performed for two simplified vehicles: A slanted-back Ahmed body at Re=30 000 and a square back Ahmed body at Re=300 000. A comparison of the resolved and modeled physical flow scales is made with corresponding LES and experimental data for a better understanding of the performance of the PANS model. The PANS model is compared for coarse and fine grid resolutions and it is indicated that even a coarse-grid PANS simulation is able to produce fairly close flow predictions to those from a well-resolved LES simulation. The results indicate the possibility of improvement of the predictions by employing a finer grid resolution.

Keywords : partially-averaged Navier-Stokes, large eddy simulation, PANS, LES, Ahmed body
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