

This thesis deals with the study of hybrid RANS/LES methods for modeling of turbulent flow with a focus on the DES method and its modifications. The theoretical part focuses on the description of turbulent flow and classical methods for its modeling. The following describes the hybrid RANS/LES methods, their principles and categories. Finally, the DES method is described in detail together with its improvement in form of DDES and IDDES methods. The practical part is devoted to the testing of DES and DDES on benchmark problems.

We describe here used software OpenFOAM and numerical methods used to discretize the equations. One part is devoted to grid generation. The DES and the DDES methods are tested on two benchmarks: flat plate with zero pressure gradient and backward facing step. The simulation results are compared with experimental data, with a focus on good modeling of the velocity profile near wall, turbulent viscosity and skin friction coefficient.