

Modeling of vortex non-steady flow field in viscous gas at subsonic speeds of an aircraft

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The paper shows the results of implementing the open source CFD software package OpenFOAM together with LES turbulence model to simulate unsteady flow fields and calculate aerodynamic characteristics. There are two cases under the study. The first one is aimed to study influence of unsteady flow field induced by an airbrake on a tail fin of an aircraft. The second case is focusing on an unsteady flow structure around a helicopter slung load with a “door-like” flaps. For the second case flow fields around the load with passive method of stabilization are modeled and aerodynamic characteristics are calculated as a function of a yaw angle. For the first case side force pulsations acting on the tail fin are analyzed.

Keywords: *open source CFD software package OpenFOAM, LES, turbulence model, vortex non-steady flow, slung loads with passive methods of stabilization, subsonic aircraft with an airbreak.*

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