

SOLVER PREPARATION FOR RELIABLE AERODYNAMIC COMPUTATIONS OF MICRO UAV

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Abstract. The main goal of this paper is to introduce way of preparation to reliable aerodynamic computations. Starting with geometry creation, solver settings adjustment to validation of aerodynamic results obtained. The issue of the aerodynamic analysis is an untypical micro UAV. The delta wing aircraft, has propeller placed in a slot in the middle of the wing. Such an unusual configuration has interesting capabilities, not fully understand yet. Getting to know basic laws ruling the flow and future intent do develop new generation of the aircraft, requires reliable results, achieved from aerodynamic simulations. Earlier wind tunnel tests of the micro UAV provide data to which CFD computations can be compared. Test case from experiments, similar to the problem that will be solved in the future, increases reliability of computations. The closer the results are, between computations and experiment, the more engineer can rely on it. Geometry model prepared for the computations has to mimic real object very well, but some simplifications are indispensable, to avoid problems with grid generation. Way of geometry obtaining and impact of the simplifications made is shown. Also effect of the solver settings adjustment is demonstrated, on accuracy and speed of computations. The present work considers all mentioned issues, resulting in procedure for solver validation for reliable aerodynamic computations.

Keywords. aerodynamic computations, micro UAV, solver settings, solver results validation