

AEROELASTIC CALCULATION FOR PRELIMINARY MANOEUVRE OF ULTRA LIGHT PLANE

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The expansion of computer technologies allows using numerical simulation in the early stages of aircraft design more and more often. The role of both wind tunnels and initial test flights used to verify and validate the solutions seems to be diminishing. Big systems for three-dimensional simulations of Fluid-Structure Interactions (FSI) constitute highly specialized and costly software. Most of the codes are based on many simplifications.

In this paper fluid-structure interaction, taking into account the preliminary manoeuvre of ultra light plane, is concerned. This phenomenon has important influence in many aeronautical applications. The method and developed system is demonstrated on ultra light I23 plane. For the first flow the comparison with experiment made in Institute of Aviation Warsaw is presented. Finally, aeroelastic simulation of full I23 aircraft configuration presents the capability of used numerical codes to analyze large-scale complex geometries for preliminary manoeuvre. All computations were carried out in parallel environment for CFD mesh of order of millions tetrahedral elements.