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COMPUTATIONAL AND EXPERIMENTAL INVESTIGATION OF AEROELASTICITY FOR THE FLUTTER AIRCRAFT MODEL

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Expansion of computer technologies allow 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 the validity of 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. Aeroelastic simulation of model aircraft based on GVT model configuration presents the capability of used numerical codes to analyze complex geometry of flutter aircraft model. In this paper fluid-structure interaction, taking into account the structural changes involving imbalance elevator, rudder and wings for the flutter aircraft model [fig].

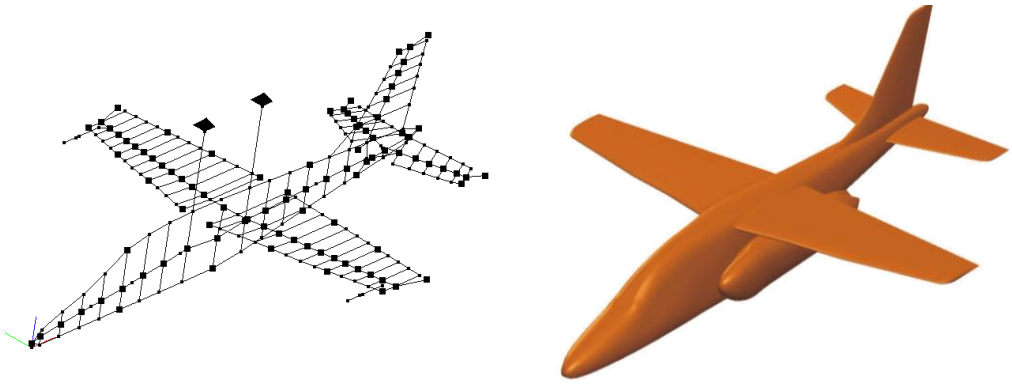

Figure: Flutter analysis model based on I22 Iryda; structural model (left) and flow model (right).

Presented numerical tool was used to simulate the assumed variants of unbalances. The calculations have allowed variants started to prepare the aircraft for structural changes in the experiment in a wind tunnel. The results of simulations for selected cases compared with the experiment conducted at the Institute of Aviation. All computations were carried out in parallel environment for CFD mesh of order of millions tetrahedral elements.

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