

## **Fluid Structure Interaction with RBF Morph: Aeroelastic Analysis of a Full Aircraft Model and Comparison with Experimental Data**

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A method for fluid structure interaction numerical modelling is herein presented. The volume mesh used for CFD calculations is parameterized according to FEM computed structural modal shapes thanks to a morpher. Modal loads are directly integrated over the CFD mesh and allow to calculate actual values of modal coordinates both for static and transient problems. Such parametric CFD model with modes embedded becomes flexible, i.e. capable to deform its shape under structural loads without the need to further interact with structural FEM model. Proposed method is demonstrated with an industrial application, the aeroelastic analysis of a Full aircraft model, using the following commercial software: NX Nastran and ANSYS Fluent<sup>®</sup> coupled with the mesh morphing add-on RBF Morph<sup>™</sup>. The results of the analysis were validated against Piaggio Aero Industries property high-speed experimental data, obtained during a test campaign performed in the ONERAS2MA transonic wind tunnel.

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