

# A Multi-Fidelity, Multi-Disciplinary Analysis and Optimization Framework for the Design of Morphing UAV Wings

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**A framework for the design and optimization of a morphing wing is presented. It allows the user to simplify the design process of a morphing UAV wing with a simple and effective interface with the possibility to easily switch between flight phases and morphing concepts. It consists of two main solvers: a high-fidelity CFD module for detailed RANS simulation and a fast low-fidelity module that solves the aeroelastic problem by coupling a geometrically nonlinear structural model to a potential flow aerodynamic model. The structure of the framework and the methodology used for the design of a morphing UAV wing are detailed. This wing is the focus of the European FP7 CHANGE project and serves as an example of the application of this methodology.**

## Nomenclature

*NSGA* = Non-dominated Sorting Genetic Algorithm  
*MOO* = Multi-Objective Optimization  
*DoE* = Design of Experiment

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