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# Wing aerostructural optimization using the Individual Discipline Feasible Architecture \*

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## Abstract

This paper presents a wing aerostructural optimization framework based on the Individual Discipline Feasible (IDF) architecture. Using the IDF architecture the aerodynamic and the structure disciplines are decoupled in the analysis level and the optimizer is responsible for the consistency of the design. The SU2 CFD code is used for the aerodynamic analysis and the FEMWET software is used for the structural analysis. The SU2 code is modified in a way to receive the structural deformation as inputs and compute the sensitivity of the outputs, e.g. drag, with respect to the deformation. An Airbus A320 type aircraft is used as a test case for the optimization. A reduction of the aircraft fuel weight of 11% is achieved. This reduction was attained by increasing the wing span, reducing the wing sweep, improving the lift distribution and improving airfoil shapes.

*Keywords:* wing aerostructural optimization, multidisciplinary optimization, Individual Discipline Feasible Architecture

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