

# Shape optimization for greener aircraft: the Dassault Aviation vision and perspectives

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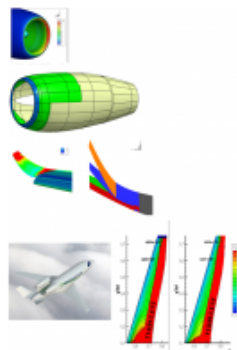
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## ABSTRACT

The ACARE roadmap beyond 2020 [1] estimates that new aircraft concepts and airframe aerodynamic improvements could together lead to 30% of fuel burn reductions until 2050, under conditions that these key technologies are fully developed until 2030. In agreement with the ACARE vision, Dassault Aviation analyses that those improvements require the introduction of airframe design based on High-Fidelity optimizations, e.g. based on Navier-Stokes CFD (Computational Fluid Dynamics).

In order to perform efficient Optimum Design of an aircraft, we developed a loop involving both a parameterized CAD and a 3D RANS (Reynolds Average Navier-Stokes) solver. Adjoint approach led us to an efficient implementation, compatible to industrial design cycle constraint. Application to Falcon Jet design, and mainly to laminar design, will illustrate our automatic optimization process.

Acknowledgements: Some part of this work has been done in the framework of DGAC contract.



## References

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