

Mitigating aviation's impact on climate change requires major transformations in aircraft configurations and operations. Digital methodologies that optimise aircraft performance will play a key role in this transformation.

Through eight industrial test cases and for 36 months, the NEXTAIR project will build and validate:

- ✓ **novel design methodologies;**
- ✓ **data-fusion procedures;**
- ✓ **smart health assessment tools.**

Together, these solutions will lead to the digital transformation of aircraft design, manufacturing, and maintenance. The project will improve methods to better tackle the uncertainty in manufacturing and the variability in operating conditions for the industrial, multi-disciplinary design of aircraft and engine components.

TEST CASES (TCs)



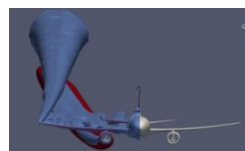
TC1: High Aspect-Ratio Wing small-medium-range configuration



TC5: Wing-USF engine aero-propulsive interactions



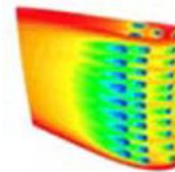
TC2: Laminar High Aspect-Ratio Wing business jet configuration



TC6: Wing-engine-exhaust interactions



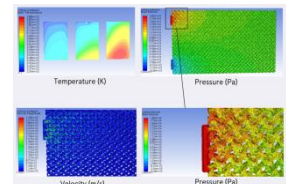
TC3: Ultra High Bypass Ratio fan



TC7: High-pressure turbine



TC4: Ducted Single Fan (USF)



TC8: Heat exchanger for hybrid electric engine

EXPECTED RESULTS & IMPACTS

NEXTAIR will :

- ✓ Increase **modelling and simulation capabilities** for new disruptive concepts and breakthrough technologies.
- ✓ Account for **manufacturing uncertainty and operational variability** in the industrial MDO.
- ✓ Extend the usability of **machine learning techniques** to design and maintenance.

This will contribute to:

- ✓ Open the way to increased synergies and feedback among design, manufacturing, and Maintenance-Repair-Overhaul phases in the aircraft life-cycle.
- ✓ Enable flawless entry into service and continuous airworthiness of European aircraft of all platforms.
- ✓ Support the development of any new aircraft configurations considering green technologies.
- ✓ Reinforce EU leadership position in the growing market of aviation digital transformation.

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