

PROGRESS AND ONGOING ACTIVITIES IN THE NEXTAIR PROJECT: AN OVERVIEW

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Key Words: *Multi-Disciplinary Design Optimisation, Uncertainty Quantification, Multi-fidelity, Digital Twins, Climate Neutral Aviation*

The NEXTAIR project [1,2] started in September 2022 bringing together 16 partners from 6 European countries, including 4 leading aeronautical industries, 2 innovative SMEs and 9 renowned research organisations, to contribute to tackle the challenge of a more sustainable aviation, towards climate neutrality. NEXTAIR aims at developing innovative multi-disciplinary design methodologies, data-fusion techniques, and smart health-assessment tools to enable the digital transformation in aircraft design, manufacturing and maintenance required by the next generation of frugal aircraft and engines. In this framework NEXTAIR will create methods and tools to: 1) improve and advance high-fidelity and multi-disciplinary modelling in design and optimisation processes, both using adjoints and gradient-free approaches; 2) account for all relevant sources of uncertainty by increasing the efficiency of uncertainty quantification and robust optimisation techniques; 3) extend the usability of machine learning methods for smart health-assessment and digital twinning. These capabilities will be demonstrated on 4 technological streams based on today's most promising technologies for future aircraft: 1) high aspect-ratio wing and natural laminar flow; 2) next-generation of ultra-efficient large-size engines employing ducted fan or open-rotor concepts; 3) airframe/engine interactions which become more and more pronounced for integrating larger engines, with challenging aero-acoustic and aero-propulsive trade-offs; 4) specific internal engine components, with focus on turbine blades and heat-exchangers, taking into account manufacturing variations. A short overview of the progress achieved in the first half of the project and of the ongoing activities will be presented.

The NEXTAIR project has received funding from the European Union's Horizon Europe research and innovation program under grant agreement N° 101056732. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.

REFERENCES

[1] NEXTAIR project website: <https://www.nextair-project.eu/>.

[2] NEXTAIR project presentation video: <https://www.youtube.com/watch?v=D0-Z8WStiK8&t=3s>