



# ***Falcon***

## Foreseeing **the next generation** of Aircraft

### **D4.1 1<sup>st</sup> Hybrid database on FSI experimental and numerical data**

Date of delivery - 19/12/2024



Funded by  
the European Union

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## DOCUMENT TRACK INFORMATION

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## BACKGROUND: ABOUT THE FALCON PROJECT

The FALCON project is a Research and Innovation Action funded by the Horizon Europe – the Framework Programme for Research and Innovation (2021-2027) aiming to develop a hybrid approach combining both cutting-edge numerical and experimental methods to analyse Fluid-Structure Interaction (FSI), better predict and control the aircraft aerodynamic unsteady loads, thus improving the aeroelastic properties and sustainability of aerostructures and reducing the related aerodynamical noise. This will ultimately contribute to upscale the current design capabilities of the European aircraft industry while enhancing the digital transformation of the European supply chain.

The project is implemented by a European consortium with 8 world-class partners including: i) Internationally recognized research groups in fluid-structure interaction using numerical simulation (AMU, KIT) and experiments (DLR); ii) Major companies developing numerical simulation software for fluid dynamics (CS) and solid dynamics. (MSC); iii) An internationally renowned research center for high-performance computing (IT4I@VSB); a leading company in France for the funding obtention, communication and dissemination of EU projects (EURONOVIA) and iv) a major actor in the European aeronautical industry (AIRBUS).

To upscale the actual design capabilities of the aeronautics industry, FALCON addresses open key-problems involving FSI phenomena to reduce noise and improve sustainability, based on a conceptual methodology built on four pillars: MEASURE, SIMULATE, BOOST, OPTIMIZE.

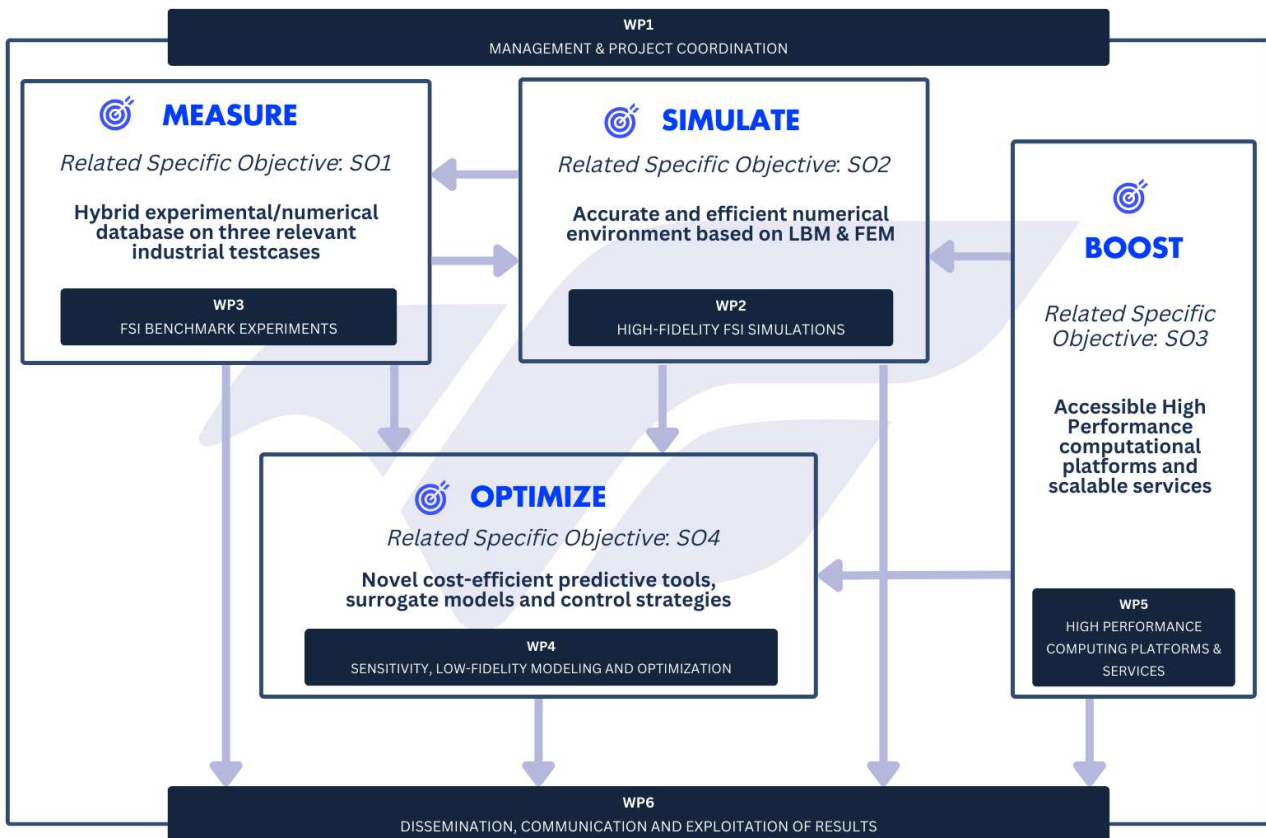


Figure 1: FALCON conceptual approach

## EXECUTIVE SUMMARY

This document is a deliverable of the FALCON Project, funded under the European Union’s Horizon Europe research and innovation programme under the grant agreement No 101138305.

This deliverable aims to collect numerical and experimental data in the hybrid database. The hybrid database is a versatile and comprehensive resource designed to advance research in sensitivity analysis and the creation of surrogate models. It consolidates various datasets, each serving a distinct purpose in enhancing numerical and machine learning models’ accuracy, robustness, and applicability. By integrating academic, numerical, and experimental datasets, the hybrid database provides a holistic platform for advancing computational techniques and bridging the gap between theory and industrial practice.

The database is **non-public during the project's initial phase, 31/12/2024**, and is accessible exclusively to consortium members via secure login.

Data are added to the database progressively throughout the project to support the development of FSI (Fluid-Structure Interaction) techniques. For experimental data, measurements must first be conducted, after which the collected data are integrated into the database.

In subsequent project phases, M24 and M36, consortium members will determine the classification of the data. Following the consortium's decisions, the dataset will then be divided into public and non-public categories. Public data will be distributed through an open repository, following the guidelines outlined in the project’s data management plan.