

Foreseeing the next generation of Aircraft

Fluid-Structure interaction of a high-aspect-ratio wing

15 PARTNERS	6 COUNTRIES	4 YEARS	01/01/24 31/12/27	4.8M€ BUDGET
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Problem and Motivation

High-aspect-ratio wing flutter is one of the industrial test cases in the FALCON project, which focuses on fluid-structure interaction (FSI) phenomena to improve aircraft aerodynamic performance. This test case concerns the dynamic aeroelastic effects, with and without forced excitation, on very flexible, high-aspect-ratio wings, which constitute one of the new technologies to reduce the ecological footprint of the next generation of aircraft. In this poster, we present a solution for the wing using an open-source software pipeline: the wing is simulated using a beam model in Julia, the fluid dynamics around the wing is simulated in OpenFOAM, and both models are coupled via PreCICE, which exchanges data between the solvers. In preliminary tests, we demonstrate the fundamental aspects of a correct and feasible simulation, along with the current challenges.

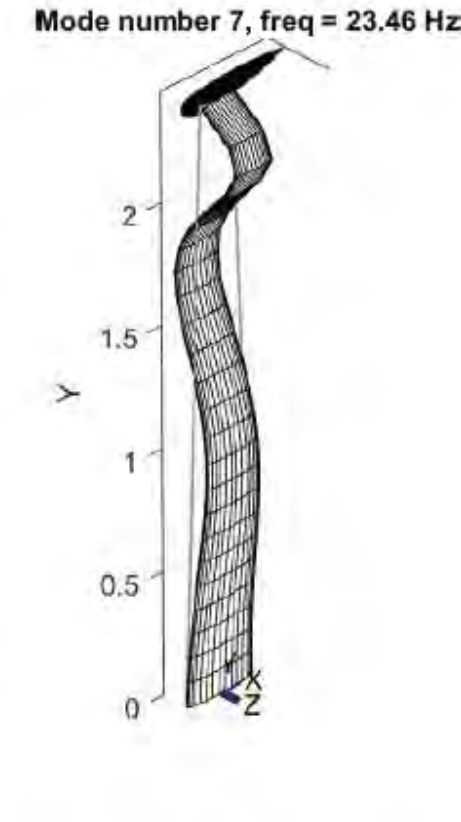
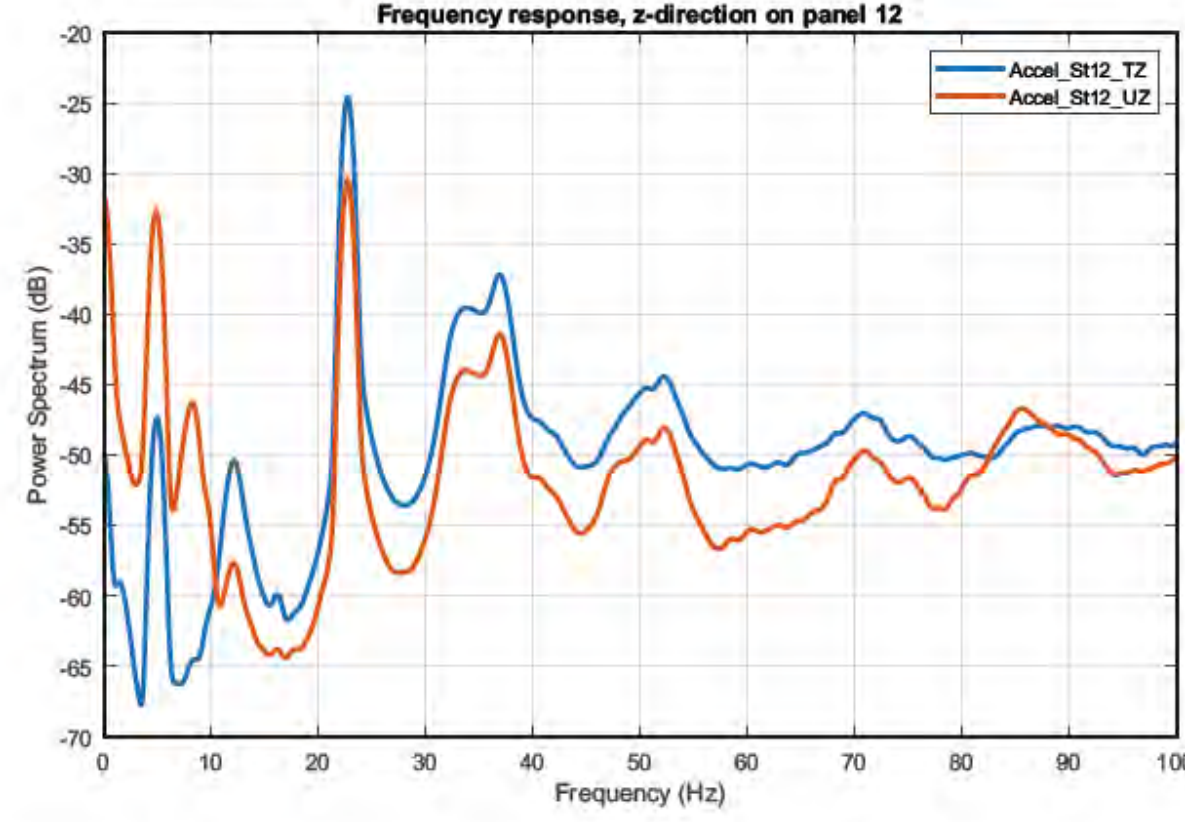
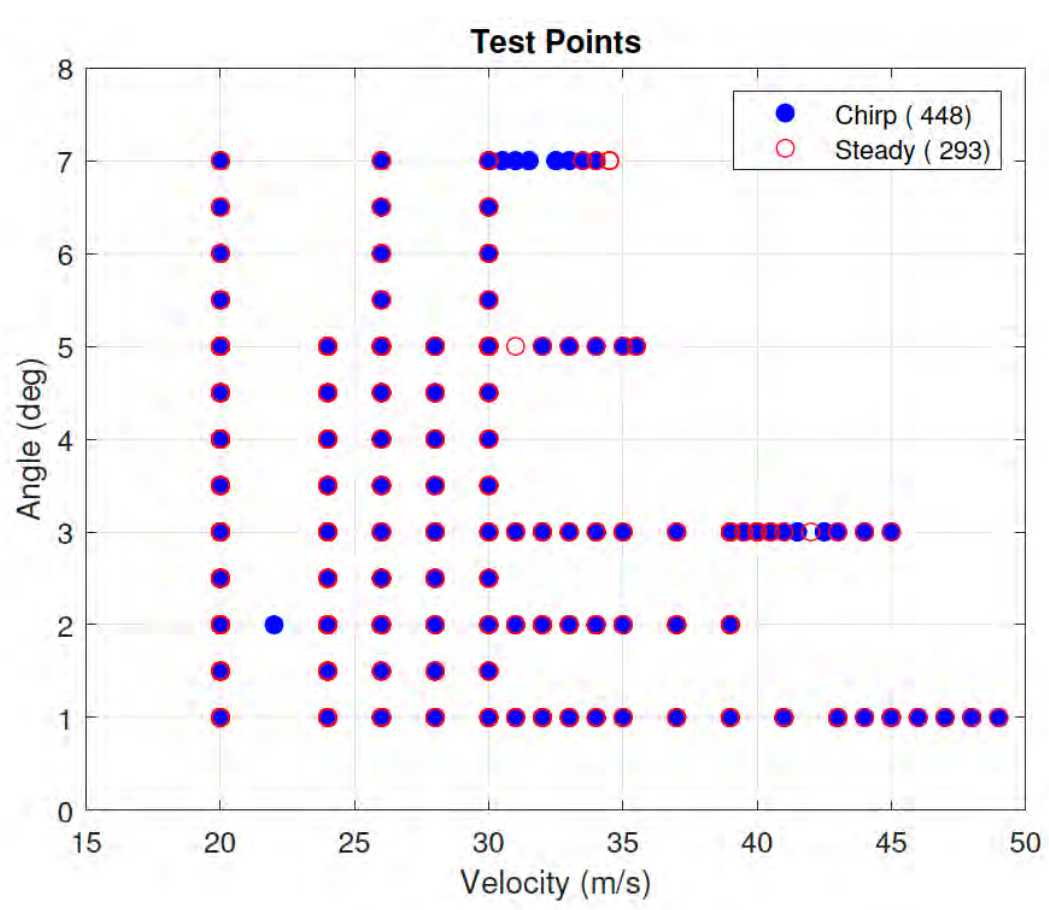
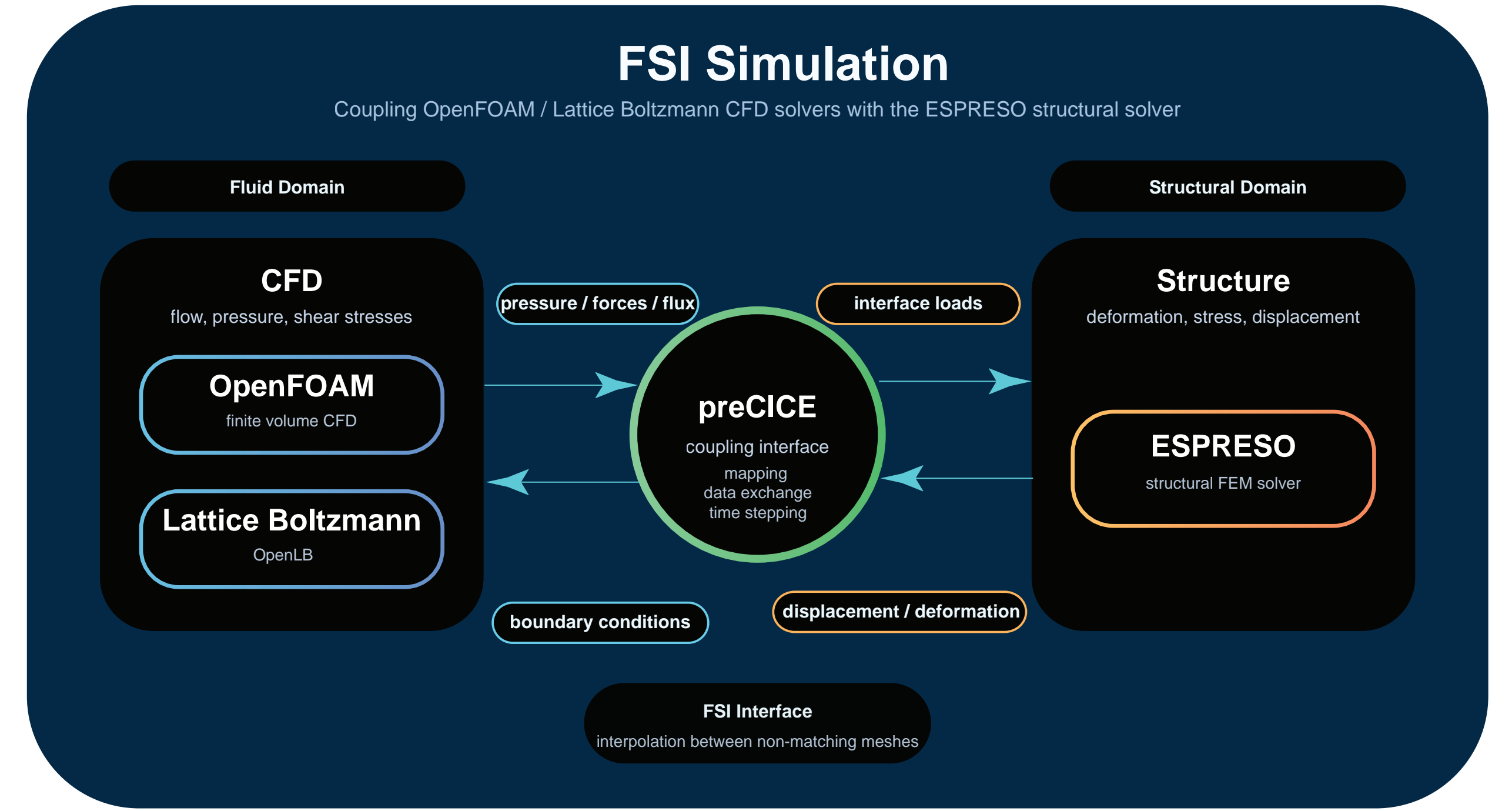
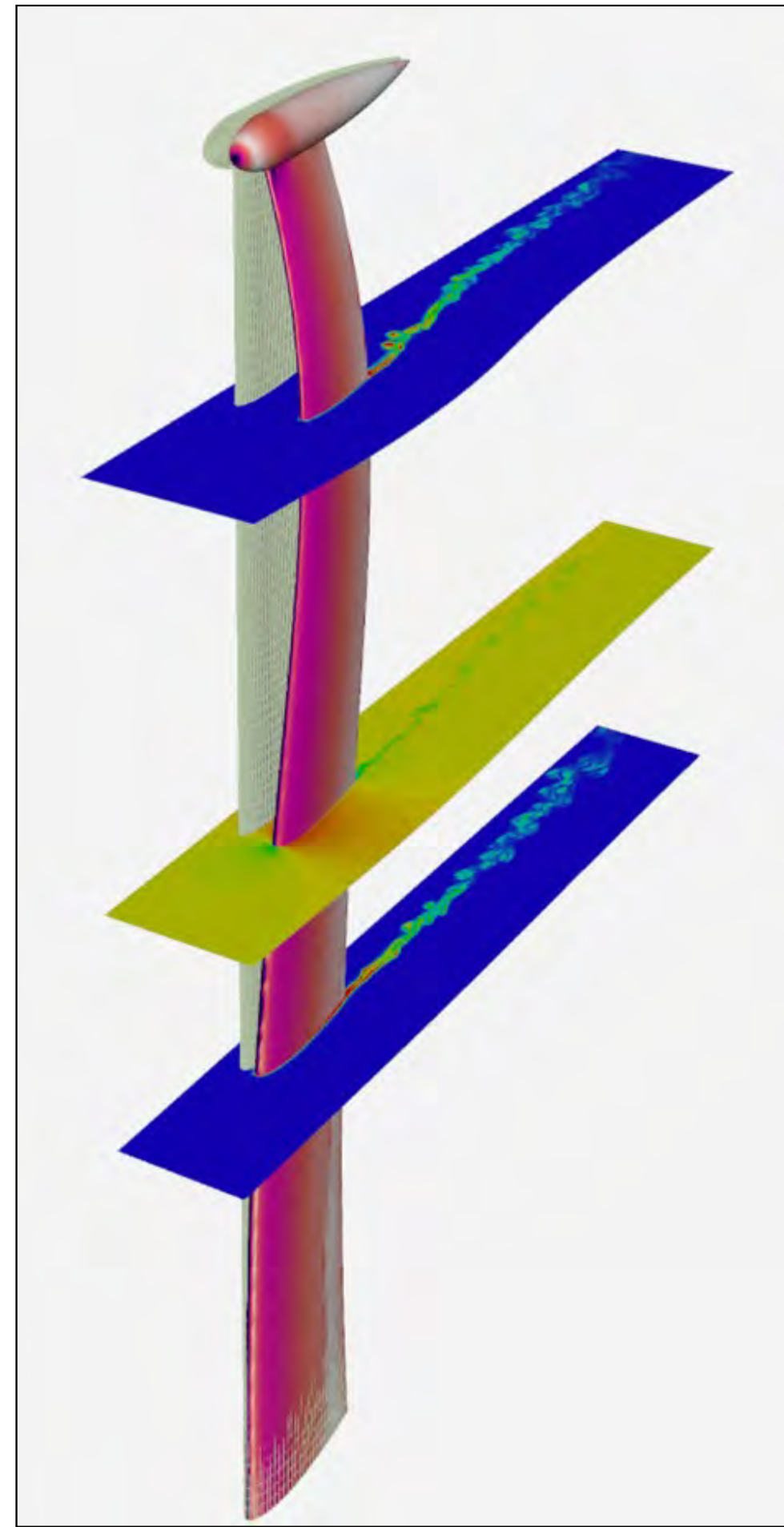
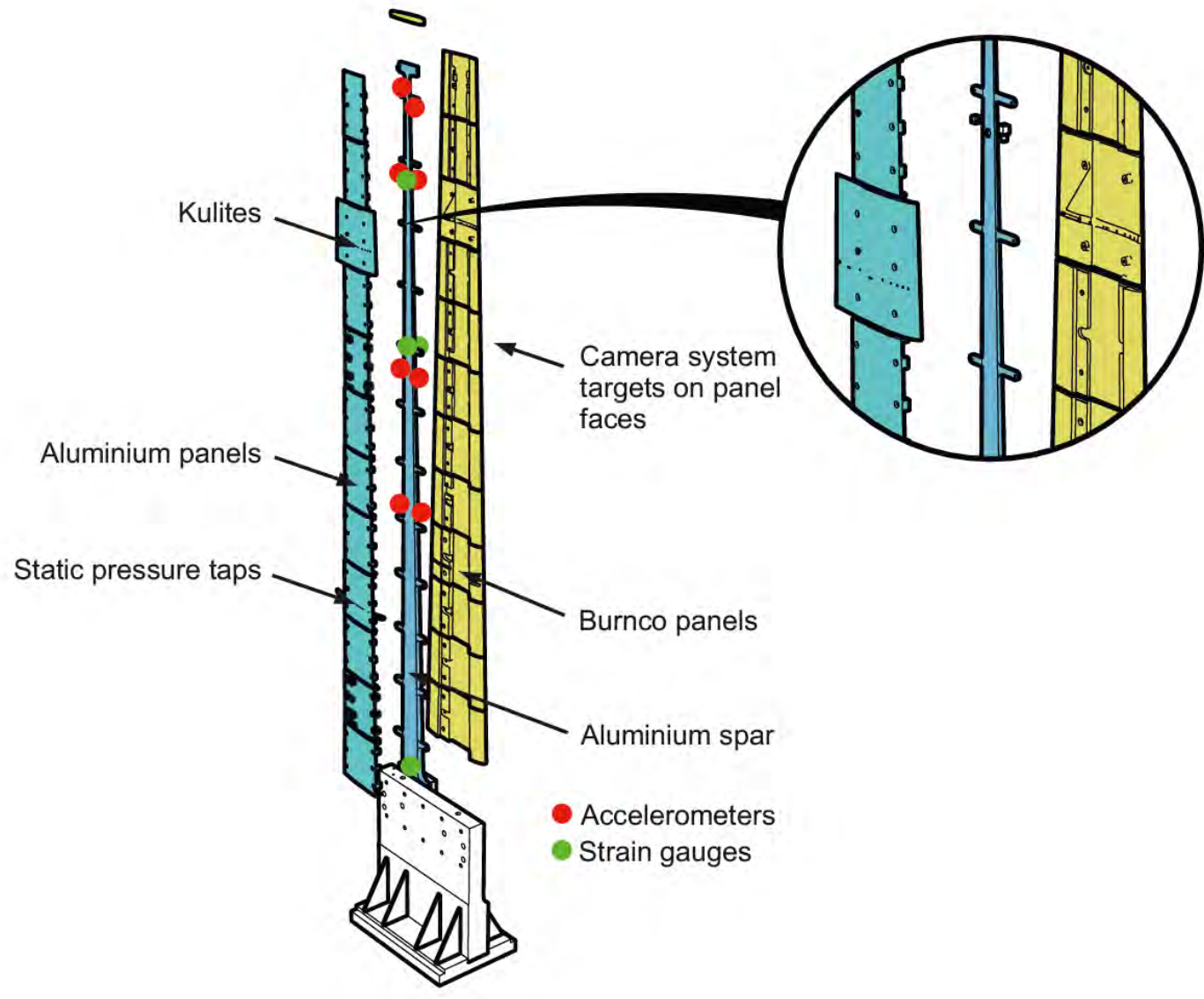
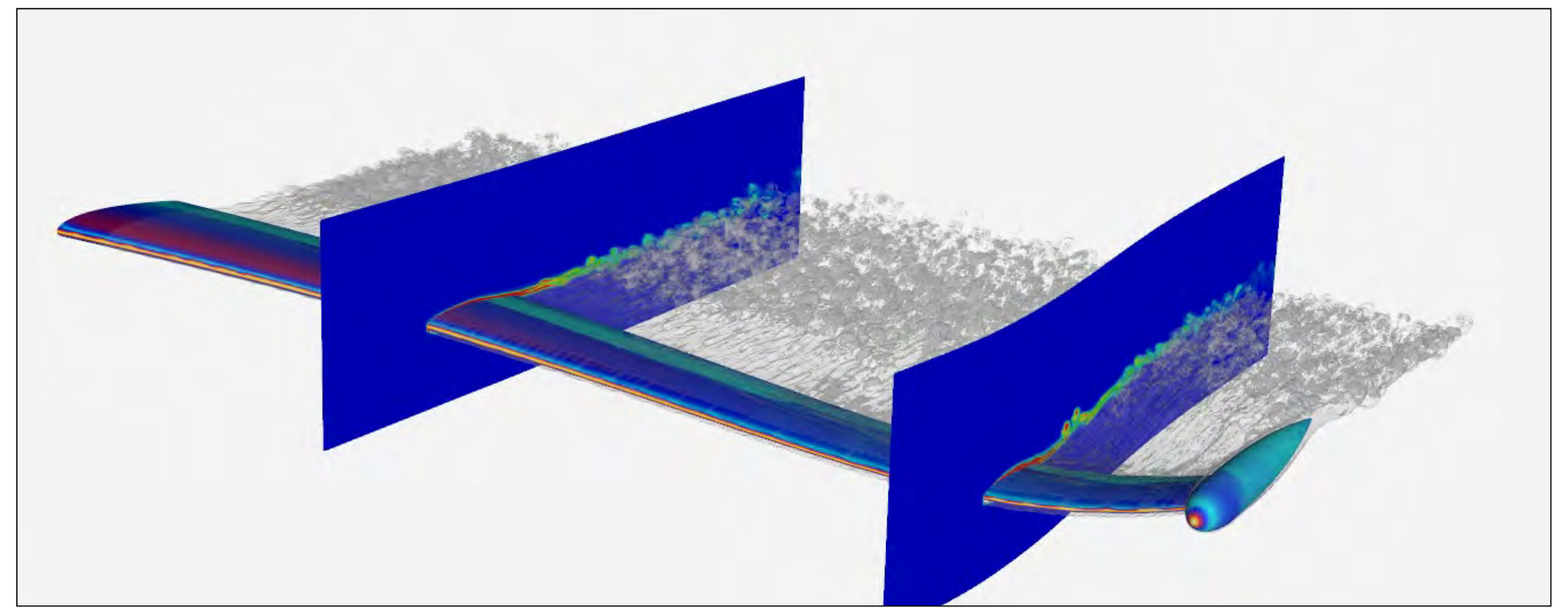


Figure 4.2: Wing response at 39 m/s 7.5 deg, mode 7 the dominant mode.



A systematic validation procedure targeting industrially relevant test cases

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