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Hyperconnected simulation ecosystem supporting probabilistic design and predictive manufacturing of next generation aircraft structures

CAELESTIS

Deliverable D3.1
Digital Product Modelling Strategy

Work Package 3
Digital Product and structural performance qualification

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Executive Summary

Abstract	CAELESTIS aims to define a digital product and structural performance qualification framework to exploit the potential of virtual testing to complement physical tests for composite materials. Within this context, this deliverable details the digital product modeling strategy defined within the scope of simulating the Caelestis Use case. Overview of the development and features of the constitutive models to capture composite damage modes for both static and fatigue loadings is provided. In addition, defect modelling at micro- and meso-scale are defined along with parametrized scripts to enhance automation and user friendliness. Model validation results are also provided to showcase the robustness of the developed models. Finally, the methodology of model implementation for High Performance Computing is also briefly explained.
Keywords	Modeling strategy; Constitutive models; fatigue loading; defect modeling; Composite materials; Digital product; High performance computing