

STRENGTH, FATIGUE AND STABILITY OF COMPOSITE STRUCTURES

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Key words: Composite design, Strength, Fatigue, Stability, Delamination, Fracture.

ABSTRACT

Composite structures excel by their excellent strength-to-weight and stiffness-to-weight ratio and have demonstrated over decades a superior potential in lightweight design. The combination of high design flexibility and high performance material properties is of special relevance in aerospace, civil, automotive and wind energy engineering, in industry design and beyond. The variety of available composite materials represents a subset of potential material designs tailored to the physical needs of various engineering disciplines and applications. The success of each design essentially depends on its failure resistance linked with the need to explore carefully the natural limit states with regard to strength, fatigue and stability. The reliable prediction of failure includes both phenomena, material degradation and structural instabilities or any combination thereof and calls for sophisticated numerical methods which allow to assess the physical response on different models and different scales. Furthermore, robustness, accuracy and computational efficiency are key factors for an innovative and sustainable composite structural design which exploits the full lightweight potential.

This mini-symposium aims at bringing together researchers from across the composite structures community to discuss and exchange latest achievements in the field of composite material and structures research. Topics of interest include, but are not limited to aspects of modeling and analysis of composite materials and structures across the scales, fracture, delamination, fatigue and stability, high-performance composites, computational and algorithmic aspects, model verification and validation by experiments and applications.