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ADVANCED COMPUTATIONAL FAILURE ANALYSIS OF FIBER COMPOSITE STRUCTURES

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ABSTRACT

Laminated composite structures have been extensively used in different applications due to their high strength and stiffness with respect to their weight. The advent of these materials has become especially relevant in aerospace, automotive and wind energy industries, although they have been also incorporated into other industrial sectors as naval engineering, civil engineering among others. Sustainable success of composite structures will very much depend on the ability to fully exploit the enormous lightweight potential. This can only be achieved if progressive failure of composites can be predicted reliably on all scales.

From the engineering standpoint, failure phenomena might be associated to the development of structural instabilities, material degradation processes or any combination of both features. The need of accomplishing optimized components has led to a systematic and progressive research interest to simulate inelastic behaviour of these structures. In this regard, the evolution of robust and accurate numerical methodologies and their validation is still an open topic in the academic and the industrial contexts.

The main purpose of this minisymposium is to discuss the recent developments in the field of computational analysis of composite structures. We invite academic and industrial contributions dealing with structural and material instability, interlaminar and intralaminar damage processes, among other failure mechanisms. In this session, there are no restrictions related to the scale of the simulations, therefore macro-, meso-, micro-, nanoscale, and multiscale studies are welcome.