COMPOSITES MODELLING: CHARACTERIZATION, BEHAVIOUR AND STRUCTURES

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ABSTRACT

At present, composite materials (especially carbon and glass fibre-reinforced polymers, CFRPs and GFRPs) are extensively used in a wide range of engineering applications. Thus, there exists an increasing demand for developing computational tools to obtain properties and study behaviour of composite material systems [1-4].

From the mechanical point of view, diverse damage mechanisms may affect the performance of such composites. These characteristic damage scenarios are generally categorized as: (i) intralaminar damage events, e.g. fibre fracture, matrix failure, fibre-matrix decohesion, among others, and (ii) interlaminar failure, i.e. delamination, or debonding between adhesively bonded entities in engineering applications [5-9]. Thus, predictive modelling tools allowing the accurate prediction of distinct failure scenarios in fibre-reinforced polymer composites (FRPCs) are desirable.

It is also noticeable that the use of composites [10] and their joints [11, 12] in primary structures has gained a great relevance in the last years. Thus, the aim of the thematic session is to share the latest developments on numerical tools used to model composites and their joints. Applications of existing tools regarding the characterization and behaviour of composites and composite structures are also welcome.

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