

Damage and Fracture of Composite Materials and Structures in Transportation Industry

Scientific area: Computational Solids And Structural Mechanics

High-performance fibre-reinforced composite materials are nowadays widely used in many structural applications. Thanks to their remarkable specific stiffness and strength, they prove to be one of the principal solutions in the design and manufacturing of lightweight vehicles. Nevertheless, due to their intrinsic brittleness and notch sensitivity, modern regulations still impose the use of high safety coefficients limiting the full exploitation of these advanced materials. For this reason, a full understanding of the degradation mechanisms that are involved in the failure of composites is pivotal for their future development and numerical models will play a crucial role in this process. This mini-symposium is dedicated to the recent advances in the computational field for the prediction and characterization of failure modes in composite materials and structures for the transportation industry. Topics of interest include, but are not limited to:

- 1) Constitutive equations for degradation mechanisms in composite materials
- 2) Failure mechanisms in composite structures
- 3) Micromechanical analysis of composite materials
- 4) Process-induced damage in composite laminates
- 5) Machine learning application in composites

Organizers:

Federico Danzi, INEGI/FEUP, fdanzi@inegi.up.pt

Denis Dalli, FEUP

Torquato Garulli, Imperial College London