

## **Analysis models for polymer composite materials throughout the length scales**

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### **ABSTRACT**

The difficulty in the prediction of the inelastic deformation and fracture of fibre-reinforced polymer composites under general thermo-mechanical loading results in the need of expensive, experimentally based certification programs, and in the non-optimal use of these materials.

This presentation will describe the efforts that have been conducted to develop enhanced analysis models for composite materials. Different length scales for the representation of the mechanical response of composite materials will be discussed: micro-mechanical models with discrete representation of the phases, meso-mechanical models based on cohesive elements and smeared crack models, and macro-mechanical models based on Finite Fracture Mechanics.