XVIII International Conference on Computational Plasticity, COMPLAS 2025
September 2-5, 2025, Barcelona, Spain

ADVANCES IN COMPUTATIONAL DAMAGE MODELLING AND TWINNING FOR COMPOSITE MATERIALS

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ABSTRACT

Recent advances in computation have allowed for leaps in the development of analytical and computational methods for studying the complex failure modes emerging in novel composite materials. A main target lies in the robust, realistic and efficient predictive modelling of damage processes, which typically evolve across multiple spatial and temporal scales. This is made feasible due to the development of algorithms capable of fusing accurate descriptions of complex geometries, computational efficient coupled physics solution strategies, the development of robust identification algorithms, and the advances in physics driven artificial intelligence.

This mini-symposium aims to establish a discussion forum to exchange ideas and identify research challenges within the remit of advanced computational procedures for the analysis, identification, and prognosis of complex damage processes. Topics relevant to the mini-symposium include, but are not limited to, numerical implementations and algorithmic solutions for:

- Physics Enhanced Machine Learning for Fracture Mechanics
- Data Driven Constitutive Law Modelling
- Vibration and impact induced fractures
- Structural health monitoring and prognosis of dynamic systems
- Efficient simulation of coupled-physics dynamics
- Advanced discretization procedures
- Verification and Validation of computational methods

Contributions pertaining to the implementation of such methods on real-life applications pertaining to the construction, energy, automotive and aerospace sectors are particularly welcomed.