NUMERICAL MODELLING OF DAMAGE CHARACTERISTICS OF CLASSICAL AND NON-CLASSICAL MATERIALS

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Key words: Damage, Crack Propagation, Computational Mechanics, Advanced numerical techniques.

ABSTRACT

Despite their localised nature, defects can significantly compromise the overall structural performance, potentially leading to catastrophic failure—particularly in brittle materials. This Mini-Symposium aims at addressing this phenomenon with the aid of computationally efficient numerical models by bringing together Researchers from various disciplines, including computational mechanics, continuum mechanics, applied mathematics, and material science. Topics of interest include, but are not limited to:

- Advanced methodologies for simulating crack propagation in classical and non-classical materials, such as the cohesive zone method, extended finite element method, phase field method, peridynamics-based strategies [1], and virtual element method [2].
- Investigations into the impact of microstructural features (e.g., size effects) on the overall damage response of homogenised complex materials.
- Efficient modelling and simulation of organised and random microstructures/morphologies.
- Machine learning and data-driven techniques for efficient material modelling.
- Analytical and computational homogenisation methods.
- Multiphysics modelling of heterogeneous materials, including coupled mechanical, chemical, thermal, and electrical processes.
- High-performance computing methods for efficient multiscale material analysis.

REFERENCES

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