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RECENT DEVELOPMENTS AND CURRENT ISSUES IN THE PHASE-FIELD MODELING OF FRACTURE

1000 COMPUTATIONAL SOLID MECHANICS

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ABSTRACT

Fracture in materials and structures is an omnipresent phenomenon observed in applications ranging from everyday gadgets to highly customized composites employed in extreme engineering applications. Since crack propagation is a complex multiscale process, its modeling poses numerous scientific challenges and calls for accurate and yet efficient approaches.

In recent years, the phase-field approach to fracture, especially in challenging scenarios such as multiple crack branching and coalescence, has garnered considerable interest from the applied mathematics and the engineering communities alike. This mini-symposium aims at providing a platform to discuss the recent developments and current issues in phase-field approaches. In view of this, the topics of interest in this mini-symposium include but are not limited to:

- Crack propagation in materials featuring inelastic constitutive behavior, particularly in the finite deformation setting.
- Improvements for realistic modeling of fracture with regard to aspects such as irreversibility, energy split, degradation and local dissipation functions.
- Advances with respect to efficient computation and implementation, including space and time adaptivity and efficient solvers, amongst others.

Although the primary focus of the mini-symposium is on computational techniques, contributions encompassing comparisons with theoretical methods and experimental results are also welcome.