CHALLENGES IN NON-LOCAL STRUCTURAL MECHANICS

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ABSTRACT

Non-local structural mechanics includes phase field, damage gradient and strain gradient theories as well as long-range force/moment interaction theories within the framework of peridynamics. These approaches were recently applied to analyse beams, plates, shells and three-dimensional solids subjected to severe loadings beyond damage initiation. Many results show their ability to capture complex facture phenomena such as damage patterns and crack branching for brittle materials, crushing of foams, strain localization, crazes and fibrils in polymeric materials, etc. The aim of this session is to discuss advances and challenges of non-local models, in particular:

- Constitutive and evolution laws for damage to capture both crack initiation and propagation

- Boundary and contact conditions within non-local setting

- Efficient numerical techniques in space and time

- Experimental procedures, for identification and validation of non-local models