

MICROSTRUCTURAL BASED CONSTITUTIVE MODELS IN HARD AND SOFT MATTER MATERIALS

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ABSTRACT

The objective of this minisymposium is to bring together researchers working on the development of microstructural based constitutive models for materials with intrinsic microstructures. Examples are hard matter solids such as metallic or cementitious materials, glasses and ceramics as well as soft materials such as elastomers, non-woven fabrics, cellular foams, hydrogels and soft biological tissues.

To develop the constitutive response of those materials, contributions presenting advanced computational techniques within the framework of the finite element method, meshfree and phase field methods, atomistic simulations, or density functional theory applied to model microstructural-driven phenomena are welcome.

We invite contributions concerned with (but not limited to) phenomena such as microscopic pattern formation in crystalline solids due to plasticity, phase transitions, damage, or twinning as well as phenomena in man-made and natural materials related to inherent network microstructures consisting of flexible or semi-flexible chains. Composite or structural materials whose macroscopic properties are particularly designed by their microstructural architecture are of particular interest.