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RECENT ADVANCES IN COMPUTATIONAL GEOMECHANICS

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ABSTRACT

Geomaterials, such as soils, rocks, concretes and snows, are the porous geological media that show the complex mechanical responses and multiscale failure characateristics in the multiphysics geological environments. The better understanding of deformation and failure mechanisms in geomaterials plays an important roles in geophysics (i.e., fault weakening and instability, and earthquake rupture), geohazards (i.e., landslides and rock avalanches towards the extreme climate change), and geotechnical engineering (i.e., geothermal engineering, and CO_2 storage reservoirs). Numerical analysis is crucial in the modern geomechanics and geotechnical engineering, which will be helpful to bridge the knowledge gaps between laboratory experiments and field-scale investigation. This mini-symposium is intended to provide a forum for presentation and discussion of recent advances in computational approaches to geomechanics. Topics within the scope of interests include, but are not limited to, the following aspects:

(1) Constitutive models, including development, implementation and validation;

(2) Mesh-based and grid-based computational methods for soils, rocks, concretes and snows

(3) Multiscale modeling techniques;

(4) Multiphysics coupling analysis in geomaterials;

(5) Data-driven and machine learning techniques in geomechanics

(6) Large-deformation modelling of geohazards and other geotechnical engineering

(7) Numerical simulations of damage, fracture and strain localization processes.

(8) Large-scale modeling and high-performance computing of geomaterials and geotechnical engineering