COMPUTATIONAL MODELS AND METHODS FOR MULTIPHYSICS PROCESSES IN MULTIPHASE POROUS MEDIA

IN HONOUR OF THE 80TH BIRTHDAY OF PROFESSOR SCHREFLER

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ABSTRACT

This invited session aims to provide a forum to discuss the recent developments in the field of computational mechanics of porous multiphase media, including geomaterials like soil and rocks, concrete, biological and engineered porous materials, to meet the challenges posed by complex coupled multiphysics problems arising in the fields of geomechanics, geophysics, environmental engineering, biomechanics, material sciences and other disciplined of applied science and technology dealing with different kinds of porous materials under quasi-static, dynamic or cycling loading conditions.

In particular, contributions related to the following areas will be welcomed: 1) computational methods and algorithms for multiphase thermo-chemo-hydro-mechanical continuum problems; 2) meshless and particle methods for coupled large deformation and flow in granular media; 3) numerical modeling of failure and post-failure conditions including strain localization, damage and fracture; 4) micromechanical modeling of multiphase granular materials in the framework of distinct element method (DEM) and molecular dynamics; multiscale modelling; 5) development, calibration and validation of advanced constitutive models for granular media, including non-local and micromorphic models endowed with internal length scales; 6) AI/Machine learning/Data driven approaches for multiphase porous materials.