24th IACM Computational Fluids Conference (CFC 2027)
March 12-15, 2027, Yokohama, Japan

ADVANCES IN NUMERICAL SIMULATION OF GEOHAZARDS

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Key words: Geohazards, Multi-deformation levels, Multi-physics

ABSTRACT

Geohazards, such as landslides, debris flows, rockfalls, and liquefaction, represent some of the most complex challenges in contemporary computational geomechanics. The fundamental difficulty in modeling these phenomena lies in the intrinsic nature of soil and rock, which are natural materials characterized by non-linear, pressure-dependent, water content-dependent, and multi-phase behavior. While numerous numerical methods and constitutive models have been proposed to address these complexities, capturing the seamless transition from infinitesimal deformation during the stable phase to extremely large deformation and high-velocity flow in the post-failure stage remains a formidable research frontier that demands innovative computational strategies. This mini-symposium aims to provide a dedicated forum for discussing the current state of the art and future trajectories in the simulation of geohazards. By bringing together experts from diverse backgrounds, the mini-symposium seeks to bridge the gap between theoretical developments and practical engineering applications. Contributions are invited on a broad range of related topics, including but not limited to the following:

Advanced constitutive modeling for granular and cohesive materials.

Numerical frameworks designed specifically for large-deformation problems.

Complex multi-physics coupling problems.

Soil-structure interaction under both static and dynamic loading conditions.

Prediction and risk assessment of geohazards.