

Multiphysics modelling of multiphase porous materials with application to soil instability

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Paper ID: 644

[Symposium S14: Mechanics of porous and granular materials](#)

Abstract

The aim of this work is to illustrate a fully coupled, non-linear, and very general physical, mathematical, and finite element model for the multiphysics modelling of non-isothermal multiphase porous materials. Applications to the numerical simulation of a prototype of the Vajont landslide, the diffuse failure of a large-scale experimental slope stability test, and desiccation cracking in clayey material will be shown to describe the model capabilities and how material and structural behaviour are strongly affected by the couplings between the phases of porous geomaterials.

Keywords:

Multiphase geomaterials. Finite element model for coupled problems. Crack-phase field approach