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Permeability changes induced by microfissure closure and opening in tectonized materials. Effect on slope pore pressure regime.

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Tectonized clays are complex materials characterized by several levels of structures that may evolve during load and wetting/drying processes. Some microstructural patterns, as microfissures, have a particular influence on the value of permeability which is one of the main factors controlling pore pressure regime in slopes.
In this work, the pore pressure regime measured in a real slope of tectonized clay in Southern Italy is analyzed by a numerical model that considers changes in permeability induced by microfissure closure and opening during the wetting and drying processes resulting from climatic actions.
Permeability model accounts for the changes in Pore Size Distribution observed by Microscopy Intrusion Porosimetry. MIP tests are performed on representative samples of ground in initial conditions ("in situ" conditions) and final conditions (deformed sample after applying a wetting path that aims to reproduce the saturation of the soil under heavy rains). The resulting measurements allow for the characterization at microstructural level of the soil, identifying the distribution of dominant families pores in the sample and its evolution under external actions. Moreover, comparison of pore size density functions allows defining a microstructural parameter that depends on void ratio and degree of saturation and controls the variation of permeability.
Model has been implemented in a thermo-hydro-mechanical code provided with a special boundary condition for climatic actions. Tool is used to analyze pore pressure measurements obtained in the tectonized clay slope. Results are analyzed at the light of the effect that permeability changes during wetting and drying have on the pore pressure regime.