

Experimental study on the effect of the oscillating confining pressure on permeability of fractured rock

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The effects of earthquakes on groundwater flow mainly include two changes: pore pressure and permeability of the aquifer. These two changes interact each other and effect the groundwater flow in the aquifer during the earthquake.

In this study, we conducted the experiments to observe the effects of the oscillating confining pressure on the permeability of fractured rocks. Three experimental samples were tested, Shirahama Sandstone, Kimachi Sandstone and Inada Granite. Macro cracks were created by hammering a chisel into the sandstone samples. For granite, a split cylinder test was conducted to generate macro cracks. The permeability was measured through the flow pump method. The confining and pore pressure were set to 7.0 and 3.0 MPa, respectively, and the oscillation period of the confining pressure was 60s. The permeability was measured before and after the confining pressure oscillation. From the experimental results, we discuss the change in pore pressure and permeability on the fault surface due to the oscillating confining pressure during earthquake.

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