

Temporal change in permeability of an active fault zone after a large earthquake

– In the case of the Nojima fault, which is one of the 1995 Hyogoken-Nanbu earthquake faults –

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For a purpose of detection of a healing process of an active fault after a large earthquake occurrence, we researched the active fault just after the 1995 Hyogoken-Nanbu earthquake. Our research was based on the project of "the Nojima Fault-zone Probe". In this report, we surveyed the Nojima fault, which is one of the 1995 Hyogoken-Nanbu earthquake faults, and three boreholes with depths of 500, 800, and 1800 m were drilled near the Nojima fault. We regarded a temporal change of a permeability of the fault as an indicator of a healing process. In order to detection of the permeability and its temporal change of the fault, repeated water injection experiments were conducted from the 1800-m borehole in 1997 and 2000. Then, the discharge changes at the 800-m borehole were observed during the water injections. In 1997 and 2000, the patterns of the discharge changes were different. We estimated the permeability of the permeable zone near the Nojima fault from the discharge changes associated with the water injections by a numerical calculation. In this calculation, we modeled the permeable zone near the fault as simple two-dimensional layer with an uniform thickness. It is found that the permeability of the permeable zone in 2000 became lower than that in 1997.