Laboratory study of water-induced microearthquakes in the inhomogeneous rock samples

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Fluids play an important role in many aspects of earthquake faulting. We investigate the effects of the fluid migration on fracture processes of inhomogeneous rock samples. We used core samples taken from a drillhole crossing the Nojima fault. We applied the differential stress to the sample under the confining pressure. We, then, injected water from the bottom surface of the sample. We took X-ray CT images of the sample to see the interior structure of the core sample. We monitored acoustic emissions (AE) and P-wave velocities. The space-time distribution of AE hypocenters reveals the fracture planes developing during the experiments. The main fracture surface was formed in the parallel direction to the foliation of the sample structure.