Slip characteristic of rock fracture in brittle-ductile zone

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The geothermal energy using the fracture-type reservoir in the continent crust more than temperature of brittle-ductile transition (350 ℃ - 400 ℃) is suggested. When using this fracture-type reservoir, there is a possibility of aseismic slip rather than seismic slip. However, characteristic and influence on permeability of the aseismic slip is unknown. Therefore, in this study, to clarify the occurrence condition, characteristics, influence on permeability of aseismic slip, injection-induced slip experiment using cylindrical specimen with 60 ˚tilted crack was conducted at elastic-plastic deformation condition. As a result, the slip behavior suggested the occurrence of aseismic slip under both conditions of elastic deformation condition and plastic deformation condition. The magnitude of slip under elastic deformation condition was bigger than that under plastic deformation condition. In addition, the penetration rate increased by 24 times under the elastic deformation condition and 2 times under the plastic deformation condition.

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