

An empirical wear law for gabbro and sandstone during high-velocity fault motion

Takehiro Hirose[1]

[1] Graduate School of Science, Kyoto University

An empirical wear law of rocks is examined by using a rotary-shear high-speed frictional testing apparatus, in order to reveal the gouge-generation processes during the high-velocity frictional sliding of faults. The experiments were conducted on gabbro and sandstone at velocities of 0.03~0.30 m/s and normal stresses of 0.3~4.2 MPa. The experimental results indicate that the wear rate (gouge-zone thickness / total slip) increases drastically with velocity and normal stress. The relationship between wear rate and normal stress shows a good fit to an exponential equation. The increase in wear rate may be caused by a subtle thermal cracking owing to the frictional heating on the simulated fault surface.