

Numerical simulation on the effects of switching thermal pressurization to melting during seismic slip.

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In this study, we formulated the numerical simulation code of faulting based on the observation of fault rock. The fault rock that was applied to the calculation was taken from the Nojima fault at Hirabayashi village. This fault rock was formed by some ancient seismic slip at about 3km depth. It is composed of very thin alternating layers of fine-grained gouge and pseudotachylyte. The thickness of slip zone corresponding to one seismic slip event is an order of only few mm. Such narrow slip zone generates the large friction heating; hence, thermal pressurization or melting of gouge occurs rapidly. When the Elastic model was used, the inertial force could get over the huge resistance of initial of melting, and finally decreased as low resistance as effective thermal pressurization.