

Recurrence intervals of intraplate earthquakes and the strength of intraplate earthquake faults

Yoshihisa Iio[1]

[1] DPRI, Kyoto Univ.

We simulated the generating process of intraplate earthquakes in a simple spring-slider-dashpot model and found that recurrence intervals of intraplate earthquakes are not determined by the velocity of the relative plate motion but by the viscosity in the ductile fault zone, the coefficients of friction of both the interplate and intraplate earthquake faults, and the stress drop of intraplate earthquakes. If we assume that the coefficient of friction of interplate earthquake faults and the stress drop of intraplate earthquakes are constant, the recurrence intervals of intraplate earthquakes are controlled by both the viscosity in the ductile fault zone and the coefficient of friction of intraplate earthquake faults. Furthermore, we found that the viscosity in the ductile fault zone is more effective for the recurrence intervals of intraplate earthquakes than the coefficient of friction of intraplate earthquake faults. Recent observations suggest that the strength or the coefficient of friction of intraplate earthquake faults with a shorter recurrence interval is smaller than that with a longer recurrence interval. This can be explained by the hypothesis that the strength of intraplate earthquake faults results from the recurrence intervals of intraplate earthquakes that are determined by the viscosity in the ductile fault zone.