

## Simulation of the recurrence of long-term slow slip events in the Tokai region -Part3-

# Fuyuki Hirose[1]; Kenji Maeda[1]; Hiroyuki Takayama[1]

[1] MRI

We simulate recurring great earthquakes in the Tokai region on the basis of the rate- and state-dependent friction law [Dieterich (1979, 1981), Ruina (1983)].

Long-term slow slip events have occurred beneath Lake Hamana with the recurrence period of about 10-30 years [Kimata et al. (2001), Kobayashi and Yoshida (2004) NIED (2004), Sagiya (2007)]. Hirose et al. (2007) tried to simulate it by introducing the spatial variation of friction parameters for asperity and other regions with taking the existence of subducting ridge off Tokai [Kodaira et al. (2004)] into account. As a result, recurring slow slip events occur with the period of about 30 years beneath Lake Hamana and its western area. We use the plate convergence rate estimated from GPS data [Heki and Miyazaki (2001)].

When hydrated minerals in the slab crust subduct into a great depth, they undergo a phase transformation and a large amount of water is liberated [Hacker et al. (2003)]. Consequently, pore pressure on the plate boundary increases through dehydration reactions, which in turn decreases effective normal stress and weakens coupling on the plate boundary [Rice (1992)]. In this study, we try to simulate the localized long-term slow slip events by setting effective normal stress 100 MPa at only beneath Lake Hamana and the same frictional parameters as Hirose et al. (2007) for the rest of regions. The result show that the new model introducing locally elevated pore pressure can also simulate a local slow slip event beneath Lake Hamana, but the constant pore pressure is not enough to simulate the recurring feature. It may be necessary to employ the time varying features of pore pressure such as Mitsui and Hirahara (2007), for example, introduced.