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Change in dilatation obtained by means of GPS and presumption of asperities for the Tokai Earthquake (2)

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Tokai Earthquake is presumed to occur in the near future along the boundary of subducting Philippines Sea Plate and Amurian Plate in the Tokai district. Therefore, very dense GPS network has been constructed in order to detect the precursory signal of the earthquake.

A slow slip event was found to occur under the Lake Hamana between 2000 and 2005 by the GPS observation results. This slow slip event occurred at deeper area of the presumed source area and it might change the conditions of the locking status on the source fault of the Tokai Earthquake.

We processed the GPS data to obtain the detailed dilatation velocities in the last report (Ukei et al., 2010). The results corresponded well with the model calculated from the asperity model by Matsumura (2007). We processed more data than the last report to get more reliable results.

We processed 95 GPS stations data which is 29 more than the last one. The duration was 3 years from January 2004 to December 2006. GAMIT ver.10.35 was used referring to ITRF2005.

The results obtained showed the clear dilatation velocity change before and after the stop of the slow slip, and also showed better correspondence with those calculated from the asperity model than the last results.

We also obtained the slip distribution from the velocity data by using inversion method by Yabuki and Matsu'ura (1992) on the plate boundary obtained by Ohta et al. (2004). This results showed that the homogeneous back-slip in the source area of the Tokai Earthquake. It is inconsistent with the results from dilatation velocity data.

Keywords: Tokai District, GPS, Crustal movements, Asperity, Tokai Earthquake, Slow slip