

# Recent State of the Transient Crustal deformation in the Tokai region

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## 1.Introduction

Analysis of Global Positioning System (GPS) data shows clear transient crustal deformation in the Tokai region, central Japan, from the beginning of 2001. The southeastward detrended displacements suggest the occurrence of aseismic slip on the plate boundary between the Philippine Sea plate and the overriding continental plate. Transient motion at Hamamatsu station amounts to 6 cm in horizontal component and 5 cm in vertical component. From late 2004, eastward displacements at several GPS sites show leveling off though southward transient motions keep a constant rate. It is not clear whether this leveling off of eastward displacements is real crustal deformation or artificial due to seasonal changes. It is also pointed out that observed displacements in the Tokai region contain post seismic deformation of the 2004 Ki peninsula earthquake. In this study, we assume that the observed displacements do not include the effects of seasonal changes and post seismic deformation from the 2004 Ki peninsula earthquake. We estimate an area of aseismic slip adjacent to the assumed source area of the Tokai earthquake with moment magnitude ( $M_w$ ) surpassing 7.1 in January 2005. The center of the estimated slip area propagated to northeast from 2001 to 2002. In this study, we estimate a current state of the Tokai aseismic slip using the latest GPS data.

## 2.Data and analytical procedure

We used east-west, north-south, and up-down components at 99 GPS sites in the Izu Islands, Kanto, and Tokai regions. Since the GPS analysis results include annual and linear trend components, we remove them from the raw time series by fitting a polynomial function and trigonometric functions to the data for the period between 1997 and 1999, when there were no abnormal events. By extrapolating the estimated linear and annual components to the entire period, we estimate the steady state deformation, and thereby the raw time series is detrended.

## 3.Results and Discussion

Our result shows a slip area appearing around the Lake Hamana, western Tokai region, close to the estimated Tokai source area from late 2000, and expanded in the middle of 2001. From late 2001, estimated slip magnitude decreased near Lake Hamana and a relative slip increase is observed northeast of Lake Hamana. The moment release of aseismic slip slowed down from the middle of 2002 till the end of 2002 and increased again from 2003. Reflecting on leveling off of eastward transient motion, the moment release rate is slightly becoming smaller from late 2004. The estimated moment surpasses  $M_w 7.1$  in January 2005. We will consider the effects of seasonal change and post seismic displacements of the 2004 Ki peninsula earthquake and report the current state of the Tokai transient using the latest GPS data in the meeting.