

Postseismic Deformation Caused by the 2004 Off Kii Peninsula Earthquake and Transient Crustal deformation in the Tokai region

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Analysis of Global Positioning System (GPS) data shows clear transient crustal deformation in the Tokai region, central Japan, from the beginning of 2001. From late 2004, eastward displacements at several GPS sites show leveling off though southward transient motions keep a constant rate. The 2004 off Kii Peninsula earthquake occurred in that time and its postseismic deformation may affect to the transient crustal deformation in the Tokai region though there is no report that this event has the postseismic deformation. In this presentation, we report the relationship between the change in the transient crustal deformation in the Tokai region from late 2004 and the postseismic deformation following the 2004 off Kii Peninsula events.

In the analysis for the transient crustal deformation in the Tokai region, we correct the coseismic step by the 2004 Kii Peninsula events by following method. We remove linear trend components of the transient deformation from detrended data fitting trigonometric function to the data for the period between 2001 and August 2004. By extrapolating the estimated linear components to the entire period, including the coseismic step, we estimate the trend of the transient deformation, and thereby the transient deformation is detrended. Finally, we calculate difference of the 1 month average before and after the earthquake using this detrended data, and correct the data as a coseismic step by the earthquake.

Several fault models based on the seismic wave analysis for 2004 off Kii peninsula events are reported (EIC Seismological Notes No. 152 and 153, Yagi's web site). We calculate the crustal deformation using these fault models, and subtracted them from the transient crustal deformation in the Tokai region for the period of 3 months after the 2004 events. The subtracted result of the fault model for main event (EIC Seismology Note No. 153) which has northwest-southeast strike and southwest dip shows very similar result compared to the transient crustal deformation for the period of 3 month before the 2004 events.

If we assume that the transient crustal deformation does not change before and after the 2004 off Kii peninsula events, this result may indicate the transient crustal deformation in the Tokai region includes the postseismic effect of the 2004 Kii peninsula events. In this stage, we just point out the possibility that change in the transient crustal deformation in the Tokai region from late 2004 may be caused by the postseismic effect of 2004 Kii peninsula earthquake. We will analyze and investigate the existence of postseismic effect of the 2004 off Kii peninsula earthquake and relationship with the change of the transient crustal deformation in the Tokai region from late 2004 more carefully.