Recent abnormal crustal movements in Tokai area observed by NIED and IGS fixed-point GPS networks

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Beginning from around fall in 2000 the abnormal crustal movements are continuing in the area northeast Hamanako Lake in the Tokai region. The movements are generally interpreted as the slow crustal event occurring at the boundary zone of the Philippine Sea plate. In the Tokai region, three GPS fixed-point sites were installed by NIED since the spring 2001. The sites are located on the two observation lines where crustal movement near the hinge line of the hypothesized Tokai earthquake is observed. Details of the time variations of the crustal movements are discussed using the analyzing result of the observation data of those three GPS sites, GPS site at NIED Hiratsuka campus, and Usuda IGS site.

NIED installed a GPS site at Tatsuyama (TAT0) in the northwest Shizuoka Prefecture and have been observing crustal movement continuously at TAT0 since the spring 2001. NIED has also begun the GPS observation at Honkawane (HKW0) site, Central Shizuoka Prefecture, again since the spring 2002. In addition NIED installed to observe the GPS measurements at Tenryu (TNR0) near TAT0 since the spring 2003. GPS data of the 56 GEONET sites established by Geographical Survey Institute (GSI) in and around Tokai area were analyzed with the NIED network data using GAMIT/GLOBK software.

As the result of the analysis, referenced with the GEONET 3077 site at Shimizu along the west coast of the Suruga Bay recent time series by GEONET data analysis seems to indicate that the movement was rapid by 2001 and slow in 2002 and again rapid in 2003. We also investigated this back-slip movement using only NIED sites, TAT0, HKW0, HTK0, and IGS network site USUD. Judging from the time series obtained by NIED and IGS sites, the movement since 2001 is continuing almost constantly.