

Interseismic spatiotemporal change of the crustal deformation field estimated from GNSS around western coast of Tohoku region

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The eastern margin of Japan Sea is known as strain concentration zone from some geological and geodetic studies. Sagiya et al. (2000) found the “Niigata-Kobe Tectonic Zone (NKTZ)”, which is large strain rate field along Niigata to Kobe, analyzing GEONET data observed from 1997 to 2000 in whole Japan. Their result does not indicate remarkable large strain more northern region from Niigata, although relatively large strain rate is presumed by geological long-term period around the area. In addition, Yokota and Koketsu. (2015) suggests the possibility of the occurrence of the slow slip event around large area in Tohoku region before the 2011 Tohoku-oki earthquake from GNSS data analysis. This result implies that there are some abnormal spatiotemporal changes of the crustal deformation field during interseismic period in Tohoku region. After the NKTZ detection, GNSS sites are increased and more longer data can be obtained. In order to investigate spatiotemporal changes of the crustal deformation field in the interseismic period around Tohoku region including eastern margin of Japan Sea, we analyzed GNSS data at 194 stations of the GEONET. Using the F3 daily coordinates, we prepare every two-years coordinate time series and estimated velocity at each site fitting linear, annual and semi-annual trend. Obtained velocity data resolved to the subducting direction of the Pacific plate (N22°W), and plotted to velocity profile dividing 20 km-width area to north to south. As a preliminary result, we obtained velocity profile around west coast from north Niigata to south Akita. Southern part shows remarkable velocity change corresponding to the NKTZ area, meanwhile it is not clear in northern profile. Differences among two-years velocity profiles at same area were not clear excluding the case of temporal postseismic deformation after some inland earthquakes. To discuss detailed spatiotemporal change of the crustal deformation in Tohoku, we need information of more wider area of the velocity field.