

Improvement of an Estimation Method of GEONET Fixed Point Coordinates

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The Geospatial Information Authority of Japan (GSI) is processing the daily GEONET station data with GEONET analysis strategy called F3, which is based on ITRF2005. The daily coordinates of all GEONET stations are calculated in this analysis and the results are used for a variety of purposes such as the monitoring of crustal movements around Japan.

In the F3 analysis, a GEONET station "TSUKUBA1" is used as a fixed point for the calculation of the daily coordinates of all GEONET stations. The coordinate of "TSUKUBA1" is estimated from IGS stations around Japan, whose a priori coordinates are given using the ITRF2005 coordinate/velocity set.

Previously, the number of IGS stations used in the coordinate estimation of TSUKUBA1 were around twenty. But today, the number has decreased almost by 40%, since the IGS stations replaced or affected by Tohoku earthquake are removed from the estimation.

As a result, the estimated coordinate value became vulnerable to data outages of the IGS stations. In order to reduce negative effect of data outages on the resulting coordinate value, we reselected the IGS stations used in the coordinate estimation of TSUKUBA1. Using the reselected 20 IGS stations, we evaluated the stability of the coordinate of Tsukuba1 and verified that sufficient stability is achieved.

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