[EJ] Evening Poster | S (Solid Earth Sciences) | S-GD Geodesy

[S-GD02]Geodesy General Contributions &Global Geodetic Observing System

convener:Koji Matsuo(Geospatial Information Authority of Japan), Yusuke Yokota(Japan Coast Guard, Hydrographic and oceanographic department), Takahiro Wakasugi(国土交通省国土地理院)
Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
In this session, general contributions from all areas of geodesy are welcomed. Topics of interest will include but not limited to recent advances in measurement techniques, reference frame realization, earth rotation or earth tide. In addition, this session also provides a forum for discussing GGOS (Global Geodetic Observing System) related observation programs, advancements of geodetic techniques, collaboration among various organizations in the world. Topics will include improvements of observing system and data analysis, participations in global programs, global reference frames and geodesy's contributions to society.

[SGD02-P02]Reference frame bias in the F3 solution of GEONET

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Accurate and homogeneous coordinate time series of GNSS data over a decade is essential for investigation of various geophysical phenomena. In Japan, precise daily coordinates of GEONET, the GNSS continuous observation system, is analyzed by network relative positioning method, and they are called as F3 solution. However, it is suggested that F3 solution may contain bias because the combination of baselines has changed in response to the change of the number of stations. In this study, we reanalyze the daily coordinate of 19 GEONET stations all over Japan for the last 21 years by Precise Point Positioning method (PPP). Since PPP makes it possible to obtain coordinate of one site independently of other sites, this solution is expected not to contain bias due to constructing analysis network. We estimate daily Helmert parameters that transform F3 solution to our PPP solution.
In some parameters, there is discontinuity between 2002 and 2003 because there are larger offsets in PPP coordinates that is caused by antenna change. This means that PPP is more sensitive to Phase Center Variation (PCV) correction than relative positioning. After 2004, scale parameter indicates a systematic bias of 2~3 ppb, which means that the F3 network is defined a little larger than its actual shape. Furthermore, 3 parameters of translation show that F3 network is deviated by 2~7 cm from the true position. Difference between F3 and our PPP coordinates suggests that vertical component mainly contributes to these bias of the reference frame. A major error source in the vertical component is considered to be the tropospheric delay, and difference of tropospheric delay of F3 and our PPP solution is correlated with that of coordinates.