

## Precision and accuracy of daily GPS coordinate time series estimated by Ambizap algorithm

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Precise Point Positioning (PPP; Zumberge et al., (1997, JGR)) analysis coupled with GPS measurement has recently become one of the preferred methods for observing crustal deformation by large number of GPS stations. The PPP method uses data such as precise ephemerides, GPS satellite clock correction, and earth rotation parameters provided by various analysis centers, such as International GNSS Service (IGS), to precisely estimate the site coordinate without any reference sites. Sato et al., (2008, J. Geodynamics) investigated ocean tide loading effect in southeast Alaska by kinematic PPP approach within several mm level precision. In their analysis, carrier phase ambiguities were not resolved. They suggested that ambiguity fixing is a further avenue for improving the kinematic positioning since this will de-correlate the three coordinate components. Ohta et al., (2008, JPGU Meeting) also pointed out high-correlation between each coordinate component by covariance matrix analysis of kinematic PPP analysis. For overcoming this weakness, ambiguity resolution (AR) is popular way after the PPP analysis. However, the processing time for full network ambiguity resolution generally scales vary with the fourth power of number of GPS sites, thus the main practical advantage of PPP can be lost. Blewitt (2008, JGR) investigated a new algorithm known as Ambizap has been demonstrated for the bias fixing of continuous GPS networks.

In this study, we report the assessment of precision and accuracy of GPS time series applied Ambizap approach. For the preliminary analysis, we analyzed 10 GEONET sites within Miyagi Prefecture during 2006.5-2008. The software used here is GIPSY OASIS-II ver.5.0. for initial PPP analysis. To apply the PPP method to our data, we used the JPL precise orbits and clock information referred to the satellite coordinates and clock correction. After the PPP processing, we applied the Ambizap package provided by Prof. Blewitt in University of Nevada. When comparison between bias-free (by initial PPP solution) and bias-fix solution (by after Ambizap applied), the N-S, E-W and U-D component for the root mean square (RMS) error for 1.5 year de-trended time series of 0550 GEONET site are 4.7mm, 2.8mm, 8.4mm (bias-free) and 3.6mm, 2.4mm, 6.9mm (bias-fix), respectively.