Real-time kinematic GPS analysis of the 2008 Iwate-Miyagi inland earthquake using by 1Hz data

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INTRODUCTION
The Iwate-Miyagi inland earthquake occurred 23:43, June 13, 2008, UTC. The damage was concentrated in the extremely limited area. A lot of phenomena such as a mud flood or the mountain collapse occurred. As for this earthquake, since GEONET sites were established near the epicenter, we are able to analyze this earthquake with valuable data. At the GEONET station, Kurikoma II (020913), which is nearest to the epicenter of this earthquake, Geographical Survey Institute reported that it moves to the 1.5 m southeast, and 2.1 m upheaval.

Outline of High-Sampling GPS Data Analysis
We extract 8 GEONET stations to surround the epicenter of this earthquake and use the 1Hz sampling data of these observation points. We cannot analyze the 1Hz sampling data at Kurikoma II that was the nearest station to the epicenter, because telecommunication line was intercepted just after this earthquake. We try to the baseline analysis refer to Sakata, side of Japan sea, and the Precise Point Positioning (PPP) analysis using by RTNet ver.3.1.0. This is the only software that can get a highly precise analysis result in true real time by re-estimating some satellite clocks.

We apply the filtering this result, since some error factors are included it. The sidereal filtering is the filter which reduces a long-term error by performing stacking processing using a regularity of satellite orbits going around the earth [Choi et al., 2004]. The spatial filtering is a filter removing an error due to the carrier phase from the satellite to a receiver as a common mode bias with data of some observation points [Wdowinski et al., 1997; Tabei and Amin, 2002]. We perform these filtering techniques with 1Hz sampling GPS data of three days before this earthquake.

Accuracy Improvement of the Real-time GPS Positioning
Our post-process results become the same result as analysis by GSI. Therefore we analyze it using the re-estimated satellite clock and IGS ultra rapid orbit that assumed the analysis in the true real time. Moreover, we compare the KiK-Net seismometer data with this result in the same way as Miyazaki et al. (2004). We introduce accuracy of the real-time GPS analysis on the basis of these results.

REFERENCES