W-phase analysis by using high-sampling-rate (1Hz) GNSS data (for the case of the 2016 Kumamoto earthquake)

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To research a focal mechanism of the large earthquake immediately in addition to its magnitude is very important for issuing an alert for evacuation. Especially the height of tsunami with the earthquake in coastal areas varies awfully with its focal mechanism. For appropriate tsunami alert issuing, Japan Meteorological Agency is performing W-phase analysis using broadband seismometers in order to obtain a focal mechanism of the earthquake (Usui and Yamauchi, 2013).
Ueno et al.(2014) and Miyaoka et al. (2015, 2016) tried W-phase analysis using high-rate sampling(1Hz) GNSS data for the 2003 Tokachi-Oki earthquake(Mw8.0), the 2011 Tohoku-Oki earthquake(Mw9.0) and its largest aftershock(Mw7.7), then CMT solutions were determined precisely. There are some advantages in using GNSS data for the W-phase analysis that we can use a great number of high dense GNSS network data operated by GSI in Japan and perform the analysis without a translation process from velocity data to displacement data which is required in the analysis using broadband seismometers.
The usefulness of this analysis method for the great earthquakes (M>=8) has been already confirmed (Miyaoka et al., 2016), furthermore we attempted to apply this method to smaller earthquakes in this study. We analyzed the mainshock in the 2016 Kumamoto earthquakes (01:25 on April 16, 2016, Mj7.3) using relatively low-frequency-band (100-300sec) and near-field stations (within 3°). As a result, we obtained a similar focal mechanism solution with GCMT by USGS.
In the presentation, we would like to show results of the analysis for the 2016 Kumamoto earthquake and also for the Off Fukushima earthquake (05:59 on November 22, 2016, Mj7.4).

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