Current Status and Recent Development of REGARD, GNSS real-time analysis system

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Geospatial Information Authority of Japan (GSI) has operated GEONET, which is a nationwide GNSS CORS network including 1300 stations and an analysis center for over 20 years. With improvements of real-time GNSS analysis technology and monitoring crustal deformation algorithm, GSI has operated REGARD (Real-time GEONET Analysis System for Rapid Deformation Monitoring) in order to estimate fault model from GNSS real-time kinematic analysis. REGARD are set three clusters according to the fixed point of RTK and independently conducts RTK analysis of about 1200 GNSS CORS in each cluster. Then, calculates displacements of each station in real time and does fault model inversion when receives EEW from JMA or detects large displacement based on the RAPiD algorithm (Ohta et al. 2012). Finally, sends results to GSI staff via E-mail.

REGARD is useful for monitoring crustal deformation as well as estimating fault model. Although the accuracy of RTK results was less than that of post-processing analysis and depended on the baseline length which sometimes exceeds 1000 km, REGARD detected crustal deformation in real time when the large earthquake occurred. On the other hand, the system sometimes could not detect crustal deformation because of the small displacement. In order to operate the system more stable, analysis and inversion method should be improved. Therefore we try to make original ephemeris to use QZSS because IGS real time ephemeris used for RTK analysis are estimated only GPS and GLONASS. We experimentally produced GNSS ephemeris including QZSS by using MADOCA (Multi-GNSS Advanced Demonstration Orbit and Clock Analysis) and investigated their accuracy.

In this presentation, we introduce recent event detected by REGARD and its development, results of MADOCA products.

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