

Examining Performance of QZSS Centimeter Level Augmentation Service (CLAS) for surveying

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QZSS (Michibiki) in a four-satellite constellation has been in official operation since November 2018. The Centimeter Level Augmentation Service (CLAS) is one of the QZSS services to accomplish positioning with an error of several centimeters almost all over Japan by using transmitted centimeter level augmentation information calculated with data from GEONET, Japan's nationwide network of GNSS CORS. The Geospatial Information Authority of Japan (GSI) examines the performance of CLAS positioning with observation data of GEONET in terms of application to geodetic surveying.

In FY2019, the GSI carried out CLAS positioning measurements in real-time with CLAS receivers (AQLQC-VCX) in 6 areas, and post-processed with CLASLIB (an open-source toolkit for PPP-RTK, Cabinet Office of Japan) data obtained at 71 GEONET stations. In the CLAS messages, gridded corrections of ionosphere and troposphere information are provided to the whole country separately into 19 networks, and therefore we selected 71 stations in a way of picking a few points within each of the networks and some points located in the boundaries of neighboring networks.

The positioning results show that almost all of them satisfied the CLAS specification positioning accuracy (horizontal 6cm and vertical 12cm in terms of 95 % probability range), but there existed a bunch of positioning results unstable, most of them suspected to be miss FIX, for a certain time period at most of the examined stations in common. In the next fiscal year (FY2020), the GSI will consider how to apply the CLAS positioning to geodetic surveying.

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