

Making of Japanese domestic gravity data which consistent to Japan gravity standardization net 2013

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Geospatial Information Authority of Japan (GSI) have established a new gravity standardization net of Japan, the Japan Gravity Standardization Net 2013 (JGSN2013), from the latest absolute and relative land gravity data which covers all Japanese islands. JGSN2013 have achieved great improvement in accuracy and special coverage by adopting FG5 absolute gravity meter as an instrument, updating station coordinates to ITRF2008 and modifying tidal correction procedure to more consistent manner through all process.

Furthermore, GSI conducted second order gravity survey which covers 14,000 stations all over Japan from 1967 to 1993. The latest gravity data archive of Japan which have higher spatial coverage and consistency with FG5 will be established from the archived data of 14,000 stations by converting them to those which are consistent with JGSN2013.

However, error checking and least square data processing of huge second order gravity data which are same procedures as those of fundamental and first order gravity data will take huge time and efforts. Moreover, second order gravity data has lower precision than first order gravity data because GSI adopted different gravimeter and procedure and the results contain several additional errors including observation errors. In addition, even if we adopt the same data processing as first order gravity data for second order gravity data analysis, we could not get the equivalent precision for second order gravity values to first order gravity values. Therefore, we are trying more efficient methods of converting original second order gravity data to new gravity data set which are consistent with JGSN2013, by developing conversion parameters from JGSN75 to JGSN2013. Our purpose is to develop an interpolation method which gives the most consistent parameters for conversion from original gravity data to JGSN2013 without generating artifacts. The model should express the relationship between two datasets and be consistent with the actual differences.

The development of the method for conversion from original second order gravity data to JGSN2013 is reported in this paper.

Keywords: JGSN2013, second order gravity survey