

Preliminary result of gravimetric geoid computation using airborne gravity data over the Boso peninsula

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The Geospatial Information Authority of Japan (GSI) plans to conduct nation-wide airborne gravity surveys over Japan from 2019 to 2022, with the aim of shifting the current leveling system based on leveling to a new system based on GNSS and Geoid. In this project, GSI aims to develop the 3-cm accurate geoid model over Japan, to quickly and uniformly derive an orthometric height with the same accuracy as the current system from GNSS positioning. Airborne gravity surveys were carried out over the Kanto region in December 2019, and airborne gravity data useful for improving the accuracy of the geoid model were obtained (Iio et al., 2020). In this study, we made the preliminary computation of the gravitational geoid model over the Boso peninsula, the eastern area of the Kanto region, using the airborne gravity data collected in this survey. The computation results suggested that the airborne gravity data was particularly effective along the coastal areas, and showed a difference of up to 15 cm in the calculated geoid height before and after the incorporation of the airborne gravity data. The consistency between the computed geoid model and the GNSS/level geoid height was improved from 3.8 cm to 3.1 cm in standard deviation by incorporating the airborne gravity data. In the future, more accurate gravimetric geoid model is expected to be developed with the addition of new airborne gravity data.

Keywords: Geoid, Gravity, Airborne gravity survey, Height reference system