

## Current status of Japan geoid model and ongoing project of airborne gravity surveys for geoid improvement

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### 1. Geospatial Information Authority of Japan

The gravimetric geoid models for Japan have been developed by the Geospatial Information Authority of Japan (GSI). The current official model is JGEOID2008 developed by Kuroishi (EPS, 2009), which is consistent with GNSS/leveling geoid heights at 971 benchmarks with a standard deviation (SD) of 8.0 cm. Matsuo and Kuroishi (EPS, 2020) attempted to improve the accuracy of the Japan geoid model by an update of gravity data and calculation methods, and developed an improved geoid model JGEOID2019 with a SD of 5.7 cm against 971 GNSS/leveling geoid heights. For further improvement of the geoid model, GSI has been conducting the nationwide airborne gravity surveys over Japan since 2019. As of Oct. 2020, the surveys over the Kanto region, the Kansai region, and the Chubu region have been completed, and the airborne gravity data with an accuracy of 1 mGal have been collected there. Using the collected airborne gravity data, we made the preliminary computation of the geoid model over the Kanto region. Consequently, we found that the consistency between the computed geoid model and the GNSS/level geoid heights in the Kanto region was improved from 3.5 cm to 2.4 cm in SD by incorporating the airborne gravity data. The airborne gravity data were particularly effective for geoid improvement along the coastal areas. Therefore, similar geoid improvements can be expected in other regions of the country.