

Investigation of data processing method for airborne gravity survey

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In recent years, a utilization of Global Navigation satellite system (GNSS) positioning has been expanded to various real time positioning services such as autonomous driving system, intelligent construction, smart agriculture and drone delivery. In order to realize the services, it is necessary to develop an environment in which anyone can use three dimensional position data including elevation data and to improve the precision of gravimetric geoid model to derive orthometric height with high accuracy from the GNSS positioning data. Therefore the Geospatial Information Authority of Japan (GSI) has been started an airborne gravity survey since 2019. The airborne gravity survey enables us to acquire gravity data rapidly, densely and homogeneously all over Japan. By combining the new data with existing things such as terrestrial, marine and satellite gravity data, we will calculate a new precise gravimetric geoid model. Then it is expected to introduce a new height system based on this new gravimetric geoid model up to 2024.

We examined a method of data processing and quality evaluation for our first airborne gravity data. When an aircraft flies eastward or westward in winter, its ground speed varies due to westerlies depending on the heading direction. Thus the variation of the ground speed brings about difference in density of gravity data. Although we process the raw data using Gaussian filter, the filter length has to be adapted to the ground speed. In this presentation, we will report the progress of the survey, investigation of the data processing method and our future vision.

Keywords: Airborne gravity survey, Gravimetric geoid model