

## Absolute gravity measurements at Jang Bogo station and Mario Zucchelli station in Antarctica

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Absolute gravity measurements in Antarctica have been started in early 1990's. The primary purpose of the measurements was to provide the reference values for relative surveys. While it is an important purpose even now, increased demands are to monitor the gravity changes due to the Earth's dynamics, such as GIA (Glacial Isostatic Adjustments) as well as present day ice mass changes. Nevertheless, the number of absolute gravity points in Antarctica is still very small and the repeated measurements are further limited. Establishing new absolute gravity points as well as the regularly repeated measurements at the existing points are strongly desired. We therefore have been conducting absolute gravity measurements at several Antarctic stations within the framework of a JSPS KAKENHI project. In 2019-2020 Austral summer season, we have conducted absolute gravity measurements at Korean Jang Bogo station and Italian Mario Zucchelli station using the FG5#210 absolute gravimeter.

Jang Bogo station is a South Korean Antarctic research station located in Terra Nova Bay and has been operated since 2014. There is a gravity point (we named it JBSAG1) where absolute gravity measurements were conducted using an A10 absolute gravimeter. JBSAG1 is located at the bottom of the maintenance bay in the heavy gear maintenance building. Absolute gravity measurements at JBSAG1 were undertaken from 17 to 24 November 2019. The measurements consisted of 48 sets of 100 drops with 30 min interval on 17 and 18, 24 sets of 50 drops with 1 hour interval from 19 to 22, and 48 sets of 50 drops with 30 min interval on 23 and 24 November. In Jang Bogo station, superconducting gravity (SG) observation was being conducted at the same period, and we also aimed at comparing the FG5 data with the SG data. For this purpose, a longer period is more desired than denser measurements. This is the reason why we conducted the measurements with the difference sampling constitutions.

Since the JBSAG1 is located at the bottom of the narrow maintenance bay with the depth of about 1 meter, the vertical gravity gradient of the point is not linear w.r.t the height. This may cause additional errors for the comparison of the gravity values obtained by different type gravimeters. We thus established another gravity point named JBSAG2 on the flat floor near the JBSAG1 in the same building. The measurement at JBSAG2 were conducted from 25 to 27 November and consisted of 48 sets of 100 drops with 30 min interval. The measurements at both points were generally very good with the measurement precision of less than 0.4 micro gals.

Mario Zucchelli station is an Italian research station also located at Terra Nova Bay and is about 10 km from Jang Bogo station. There are two gravity points named TNB AB and IAGS where absolute gravity measurements have been repeatedly conducted thus far. The measurements at TNB AB were conducted from 30 November to 2 December. The measurements consisted of 100 drops/set with 30 min interval and 129 sets of data were obtained. The measurements at IAGS were conducted from 3 to 5 December with the same sampling constitutions and 124 sets of data were obtained. The measurements at both points were also very good with the measurement precision of less than 0.4 micro gals.

In this presentation, we report the outline of the measurements and the preliminary results.

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