Local gravity measurement to detect temporal gravity change in Antarctica

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Relative gravity measurements have been carried out at four times since February 2012 at five sites along Yatude Zawa valley in Langhovde, East Antarctica. Yatude Zawa valley locates in the vicinity of the Langhovde Glacier and we intend to detect gravity changes induced by mass change of the Langhovde Glacier and surrounding Antarctic ice sheet.
Metal markers of the measurement sites were constructed on outcrop rocks on February 4th, 2012 in the JARE53 operation (Doi et al. 2015). Simultaneously, relative gravity measurements with a LaCoste & Romberg (LCR) gravimeter G-1110 were conducted at the sites referring an absolute gravity measurement at AGS01 in Langhovde measured on February 3, 2012 (Kazama et al. 2013). After the first relative measurement, three round-trip measurements were conducted at the five sites at November 25, 2012 with LCR G-805, September 16, 2015 with LCR G-805 and December 27, 2015 with LCR G-1110.
Gravity increases of a few hundred micro-gals are observed at the all relative measurement sites for approximately four years, although measurement errors at the all sites are greater than 170 micro-gals at the last measurement. We plan to carry out absolute and relative gravity measurements at the same sites again in 2017-2018 austral summer season. We will use multiple relative gravimeters at the relative measurements to improve the measurement accuracy.
In the presentation, we will show the gravity measurements in detail. We also intend to investigate causes of the temporal gravity increase from the aspect of ice sheet mass changes.

Keywords: Relative gravity measurement, Ice sheet mass change, East Antarctica

