

Gravity changes around Ito campus, Kyushu University by using hybrid gravity measurement

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Ito campus, Kyushu University is located in the western end of Fukuoka city, Northern part of Kyushu, Japan. There are 30 wells in order to monitor the groundwater level. Repeat gravity measurements using Scintrex CG-3M gravimeter around Ito campus were conducted before construction of the campus. The seasonal gravity changes were observed and there were good correlation between the gravity changes and groundwater level changes. We started the repeat gravity measurement using Scintrex CG-5 gravimeter since 2009. We established 12 observation points, because almost observation points of previous study were destroyed by the construction of the campus.

The A10 absolute gravimeter (Micro-g LaCoste Inc.) was introduced in order to monitor the gravity changes at base observation points since 2008. We observed seasonal gravity change (Maximum change was 25 micro gal), and we compared with the groundwater level changes. There are good correlation between the gravity changes and the groundwater level changes. We calculated the effect of groundwater level changes using Gwater-1D (Kazama et al., 2010). As a result of the calculation, we can explain the gravity seasonal changes were caused by the groundwater level changes.

The gravity changes of the base observation were removed from each observation point. We can see the good correlation between the gravity changes and the groundwater level change in the almost observation point. The effect of the construction of the campus awaits future studies.

Keywords: A10 absolute gravimeter, Hybrid gravity measurement, Groundwater level change, Gravity changes