

Absolute gravity measurement using A10 absolute gravimeter around Gundih gas field for CCS monitoring

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Indonesia government plans to reduce CO₂ emissions by 26% from 2005 levels by the year 2020. It is thought that one of the large quantities of CO₂ are released into the atmosphere during production of natural gas at gas processing. And it is one of the serious problems for the achievement of the national purpose of a total CO₂ reduction. This problem can be solved by establishing a system for carbon dioxide capture and storage (CCS) technology in which the CO₂ from natural gas production is captured and injected into the ground as a means of directly reducing CO₂ emissions. The SATREPS project "Pilot Study for Carbon Sequestration and Monitoring in Gundih Area, Central Java Province, Indonesia", which is funded by JICA and JST, is conducting a research and development of safety storage of CO₂ in the subsurface and to establish monitoring technologies in the Gundih gas field in Central Java, where natural gas production is just started.

We started the absolute gravity measurements using A10 absolute gravimeter (Micro-g LaCoste Inc.) at 6 station. In 2014, we added 3 station near the candidate place for CO₂ injection. The A10 absolute gravimeter is a portable absolute gravimeter produced by Micro-g LaCoste Inc. It operates on a 12V DC power supply (i.e. vehicle battery). We can measure the absolute gravity using the vehicle battery at the field. We measured 10 sets at each measurement, and 1 set consists of 100 drops. We observed gravity decrease (30 micro gal) in KTB1. But we did not detect the significant gravity change. We set the soil moisture meter near KTB1 station in 2013. Though we could not get the data for a long time, but we got about 2 month soil moisture data. Based on this data, we estimated the gravity effect caused by soil moisture change.

We predicted the amount of gravity changes caused by CO₂ injection based on the results of CO₂ injection simulation. We will report the result of the prediction.

Keywords: CCS, Micro-Gravity Monitoring, Absolute Gravity Measurements