Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

SGD24-P08 Room:Convention Hall Time:May 25 13:45-15:15

Gravity observation using a superconducting gravimeter at Ishigakijima, Japan

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We have started gravity observation using a superconducting gravimeter (SG) at the VERA Ishigakijima Station, National Astronomical Observatory Japan, with the aim of detecting possible gravity changes associated with the slow slip events taking place in the Iriomotejima/Ishigakijima region. The gravimeter (serial number CT36) used in this project was in operation at the Inuyama Observatory, Nagoya University for about ten years. We have chosen to refurbish and reuse the instruments to move them to Ishigakijima island. Refer to Tanaka et al. (this session) for the objectives of the whole project, and Ikeda et al. (this session) for the preparation of the instruments at Inuyama and Tsukuba.

Installation work of the SG at Ishigakijima took place from January 30 through February 4, 2012. The gravimeter pier in the VERA Ishigakijima Station is 2m x 1.5m wide, about half of which is occupied by the SG. The other half of the pier is reserved for future regisration of an absolute gravimeter. The three granite blocks as the gravimeter base are placed on the pier with rubber sheets inserted underneath them, and are anchored to the pier using L-shaped angles. We have not fastened the refrigerator support frame to the pier but simply adjusted it for the alignment with the Dewar. The gravimeter is housed inside a plastic cover so that airflows from the air-conditioner do not hit it directly. Gravimeter controllers as well as data acquisition equipments are placed outside the pier. We have built a new hut next to the building where an air-cooled compressor is housed. We have installed a soil moisture gauge outside the building, and several meteorological sensors such as a rain gauge will be added in the near future.

As of this writing, we are aware of electronic problems in the gravimeter system, including noise contamination associated with the operations of the VLBI antenna. Further adjustment of the instruments is needed to improve the quality of recordings. We will characterize the first data obtained at Ishigakijima, and also introduce gravity data to be acquired in the next slow slip event, which is predicted to take place in March 2012.

Keywords: superconducting gravimeter, slow slip, Ishigakijima