

## Gravity changes at Hachijo island caused by the displacement of the Kuroshio current

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A three-year research project has been begun since fiscal year 2010 (FY2010). The final goal is to develop a reliable monitoring system that can detect small effects on a hot spring caused by geothermal exploitation (Yasukawa et al., 2011). We have started gravity monitoring by means of continuous measurement and time-lapse measurement for the project at southern Hachijo Island, where a 3.3 MWe geothermal power station has been in continuous operation since March, 1999 and several hot spring wells were drilled. We aim to detect a change in groundwater and hot spring water level with a resolution of 10 cm with continuous gravity measurement (Nawa et al., 2011). Roughly it is equivalent to a resolution of 1 microGal. On Hachijo Island we must distinguish local gravity changes occurring in connection with hydrothermal process of hot spring, from those of geothermal power generation, groundwater, and tidal current around the island. Regarding the tidal current the displacement of the Kuroshio current may cause gravity change on Hachio island.

We set a new type of metal spring sensor gravity meter gPhone-119 at the gallery of the broadband seismic station HJO of the F-net networks operated by NIED, in 2010FY creating a continuous 34-day record. Removing tidal component and air-pressure response from the continuous record we detected the gravity variation whose amplitude is about 20 microGal. The displacement of the Kuroshio current was reported by Japan Coast Guard that the current axis was northwest off the island at first then moved to southeast off the island during the period. Observed gravity change is reproduced by calculating the effect of the dynamic topography of the Kuroshio current. Removing the tidal current effect from the observed record we can evaluate the local gravity changes occurring in connection with hydrothermal process of hot spring and others.

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