

Continuous gravity observation using a gPhone-109 at a hot spring area of Hachijojima, Japan

NAWA, Kazunari^{1*}, SUGIHARA, Mituhiko¹, NISHI, Yuji¹, TOSHA, Toshiyuki¹, ISHIDO, Tsuneo¹, SAKAGUCHI, Keiichi¹

¹AIST

Gravimeter is a useful tool for detecting subsurface mass variations. For elucidating groundwater variations in hot spring area, we carried out continuous gravity observation with a gPhone-109 in the Nakanogo gravity observation hut of Hachijojima (GOH) at the period from November 2011 to February 2012. We also measured absolute gravity values with a FG5-217 gravimeter for a drift correction of gPhone gravimeter. In addition to gravity measurements, we collected data of atmospheric pressure, rainfall, soil moisture and the monitoring well (e.g. water level and temperature) in the vicinity of GOH. A preliminary result is that, in the late of December 2011, we detected gravity decrease of an approximately 5 microGal that occurred about 3 days after groundwater temperature decrease of the monitoring well of an approximately 1 degree Celsius. In addition to the case, several small gravity changes of microGal level are observed in the observation period. Therefore we will compare gravity changes with estimated precipitation effects and/or observed sea level changes for extracting a gravity signal related to mass variations of a hot spring reservoir.

The authors wish to express their deep gratitude to the Tokyo Electric Power Services Corporation and to Hachijo Town local government for providing generous and courteous support to our field survey team. This study was supported by the competitive research fund of the Ministry of the Environment.

Keywords: hot spring, geothermal power, groundwater, monitoring