

## Continuous monitoring of absolute gravity at Miyakejima island volcano

# Masato Furuya[1], Shuhei Okubo[2], Wenke Sun[3], Jun Oikawa[4], Yoshiko Yamanaka[4], Hidefumi Watanabe[5]

[1] ERI, [2] Earthquake Res. Inst., Univ. Tokyo, [3] ERI, Univ Tokyo, [4] ERI, Univ. of Tokyo, [5] Earthq. Res. Inst., Univ. Tokyo

<http://www.eri.u-tokyo.ac.jp/furuya/miyake/AbsG.html>

We have been observing the spatio-temporal changes in gravity of Miyakejima volcano, using both absolute and relative gravimeter (Furuya et al. 2001). Although caldera growth stopped and the speed of crustal deformation became slow on September 2000, the absolute gravity still showed significant gravity changes of 5-10 microgals for the following half a year. Crustal subsidence at the site after September 2000 is less than 3 cm according to a GPS receiver, and thus we may interpret the detected gravity changes in relation to the updown of ground water reservoir and/or a position of the magma head inside a conduit (Okubo et al. 2001). In response to a revival of electric power supply in the evacuated island on May 2001, we started a continuous monitoring of absolute gravity from July 2001.

We detected a gravity increase of about 10 microgals during about one month since October 2001; any predictable gravity changes such as tides as well as barometric pressure effect are automatically corrected in the absolute gravimeter. The baseline length changes detected by GPS receivers in the same time period tell a shortening of 5mm/month. Hence, crustal subsidence alone cannot explain the gravity increase of 10 microgals. Further, quick bulletin of ocean conditions reported by Japan Hydrographic Department shows no evidence of significant sea level rise during the same period. Hence we provided a qualitative interpretation that magma was upwelling inside a conduit for that moment. Meanwhile, JMA reported on November 2001 that an air glow in the night was observed after about 1 year's of quiescence, and that the temperature around volcanic vent has increased to 450 degreeC. We regard these reports by JMA as a verification of our interpretations. We will construct a more quantitative model and to discuss the gravity changes afterwards. Acknowledgement: The continuous monitoring of absolute gravity is greatly indebted to staffs at Division of volcano and Miyakejima Weather Station of Japan Meteorological Agency. We also thank for Department of Police and Fire of Tokyo Metropolitan Government, Japan Hydrographic Department and Japan Defense Agency.