

GPS and Gravity observation at Numanotaira crater in Adatara volcano

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We revealed a source model of Adatara volcano from 1998 to 2005, by using GPS and gravity observation.

GPS observation shows that southwest region of Numanotaira crater inflated from 1998 to 1999 and central region of the crater has been deflated continuously after 2001. According to the grid search method with 10m-grid-scale, the former pressure source lies in 10m of depth beneath the crater, and the latter source does in 170m of depth. The amounts of volume change were $4.8 \times 10^3 \text{m}^3$ and $-31.3 \times 10^3 \text{m}^3$, respectively.

Gravity observation has been performed at 2 times per year from 2001 to 2005, deflation stage by GPS observation. Two type instruments were used to measure gravity; one is G type of La Coste & Lomberg Ltd., and the other is CG-3M type of Scintrex Ltd. Two instruments were calibrated each other. Measured value was variable correction; drift, atmospheric pressure, tidal, free-air and Bouguer correction. In the crater, corrected gravity value of every point has increased continuously from 2001 to 2005, and the value amounted to 0.097 - 0.156 mgal.

If this amount of change is assumed to be movement of underground mass, it explains that the substance of density 103kg/m^3 flow in thickness ranging from 2.3 to 3.7m under the crater bottom.

According to evaluated pressure sources by GPS observation, pressure activity increased up to around 2000 and after that decreased. We presume that these activities are originated hydro thermal activity rather than magmatic activity, because pressure source is so shallow. Since hydro thermal activity has decreased after 2000, groundwater around the crater has flowed into under the crater. We presume that amount of gravity change was caused by this hydro thermal activity.