

Tracing magma head in the volcano with continuous gravity monitoring (1)

Shuhei Okubo[1]; Takao Ohminato[2]; Jun-ichi Hirabayashi[3]; Kohei Kazahaya[4]; Toshiya Mori[5]; shigeo Matsumoto[2]; Etsuro Koyama[6]; Wenke Sun[7]

[1] ERI, Univ. Tokyo; [2] ERI; [3] VFRC, Tokyo Inst. Tech.; [4] Geol. Surv. Japan, AIST; [5] Lab.Earthquake Chem., Univ.Tokyo; [6] Earthquake Research Institute, Univ. of Tokyo; [7] ERI, Univ Tokyo

<http://www.eri.u-tokyo.ac.jp/okubo>

With high-resolution continuous gravity recording from an absolute gravimeter on a volcano flank, we have detected minute gravity acceleration associated with a recent volcanism. Detected changes are of order 10 nm s^{-2} (1 micro-Gal, about $1\text{E-}9$ times the surface gravity acceleration). Significantly important is that major eruptions occurred within 1-3 days after gravity reached temporary maxima. Gravity variation can be translated into a change in magma head height using a simple line mass model. The estimated height agrees with both seismological and volcanic gas observations. Continuous absolute gravimetry can contribute to the studies of volcanism and the mitigation of volcanic hazards.