

Tidal resonance phenomena detected by absolute gravity measurement at Ontake volcano (II)

Toshiyuki Tanaka[1]; Torao Tanaka[2]; Fumiaki Kimata[3]; Rikio Miyajima[1]; Harumi Aoki[1]

[1] TRIES; [2] none; [3] Res. Center Seis. & Volcanology, Graduate school of Environ., Nagoya Univ.

<http://www.tries.jp/>

We have been carrying out repeated absolute gravity observations since 2004 at the Mitake district on the eastern slope of the Ontake volcano, Japan. We detected not only annual gravity changes, but also (1) a few microGal gravity variations and (2) growth of standard deviation during a campaign measurement. Both (1) and (2) synchronized with diurnal tide [Tanaka et al., 2006, Seismological Society of Japan, Fall meeting]. We proposed a model interpreting these phenomena comprehensively [Tanaka et al., 2007, JPGU Meeting 2007]. After that, we have confirmed the existence of both (1) and (2). In this report, we will report these results.

As for (1), the validity of tide and atmospheric pressure corrections is most important. The ocean load tide values by the g software which is included in the FG5 system and adopts the Schwidersky model by default differs from the one by GOTIC2 & NAO99b model [Matsumoto et al., 2001] about 2~3 microGal systematically. The solid earth tide values by the g software which has Tamura's 1200 potentials don't differ systematically from the decomposed one by BAYTAP-G [Tamura et al., 1991] in the observed records except for DC offset of about 1 microGal. Any combinations of these tidal corrections remain the existence of (1). The atmospheric correction is almost negligible as far as usual admittance factor (-0.20~-0.45 microGal/hPa).

As for (2), the Scintrex CG3M gravimeter installed with the FG side by side also slightly observed the SD growth synchronized with diurnal tide. Furthermore, the CMG-3T broadband seismometer at the Ontake Ropeway about 7km east from the FG5 observation site could detect such a phenomenon as noise level variation synchronized with diurnal tide (See Figure).

Figure caption: Spectrogram of CMG-3T at the Ontake Ropeway. The processing procedures are following: original 100Hz data, 5Hz low-pass filtered, 10Hz down sampling, derivation to acceleration, and Power spectral density calculation by 4 hours window moving 2 hours step

Acknowledgement: Nagoya univ. (Drs. Yamazaki and Nakamichi) and Nagano prefecture provided us the CMG-3T data.

