

## Recent volcanic condition of Akita-Komagatake

Choro Kitsunozaki<sup>1\*</sup>, Atsushi Muraoka<sup>2</sup>

<sup>1</sup>none, <sup>2</sup>Sogo Geophysical Exploration Co. Ltd.

In the Akita-Komagatake volcano, the geophysical observations have been carried out mainly on ground-temperature (1m-depth), geomagnetic field (total intensity), and gravity since 1975, to monitor volcanic conditions. The observation points were located in and around the Medake, one of the central cones in the south caldera of the volcano, which erupted in 1970-71.

Geothermal zones expanded into areas around the crater on the top of Medake in a few years after stop of the eruption. The geothermal zones shrank after their uppermost period of 1978-79. Until about 1998, the ground-temperature in most of the areas lowered nearly to the normal temperature, except the narrow zone (about 180m by 30m) in the north-east edge of the top area of Medake, where higher temperature somewhat remained. Revival tendency of the ground-temperature in this zone was recognized about 2006. In 2009 the geothermal activity remarkably extended in and around this zone. In consequence, the geothermal steaming zones were observed in the ENE side and SE side of the Medake.

Geomagnetic total intensity in the active geothermal zone changed corresponding to the variation of ground temperature, but in reverse sense. It is explained as result of intensity variation of magnetization in shallow rocks, caused by the temperature change bellow the boiling point.

Gravity variation has been observed on fixed points (concrete bases) in and around the Medake. Gravity increased in areas near the top of Medake according to the decrease of geothermal activity from 1977 to 1998. But it has decreased in recent years, corresponding to the revival of geothermal activity.

Gravity variation may be interpreted to be caused almost by the elevation variation. According to this interpretation, the top of Medake sank about 0.8m from 1977 to 1998, and then has risen about 0.2m until 2009 by the recent revival of geothermal activities.

The LaCoste & Romberg G-type gravimeter was used throughout the gravity observation, however the gravimeters used were different between before 1998 and in 2008-09: that is G308 and G579. The difference of scale constants of them was considered in the interpretation.

The crustal deformations including the elevation variation can be directly observed by such a modern tool as GPS in the present day, but continuation of the observations is regarded as major importance in this research. The authors wish that this research maintained relatively in long time will be taken over to new systematic observations by any facilities for the future.

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