Vertical displacements between 1997 and 2001 along the northeastern mountain road at Mt. Tarumai

Hitoshi, Y. Mori[1], Atsuo Suzuki[2]

[1] Inst. Seismolgy and Volcanology, Hokkaido Univ., [2] Inst. Seismology and Volcanology, Hokkaido Univ.

A leveling route, which consists of 39 bench marks along the mountain road at the northeastern side of Mt. Tarumai, was settled by Hokkaido University in 1997 at the time of 'The Joint Geophysical and Geochemical Observations of Three Active Volcanoes in the Southwestern Hokkaido'. The first leveling survey were carried out by the staff of Hokkaido University and Nagoya University in July and August 1997.

In 2001, Geographical Survey Institute settled leveling routes on the eastern side of Mt. Tarumai including the former leveling route. They also measured bench marks settled in 1997.

As the result of comparing two set of the relative heights at those bench marks, it is obvious that Mt. Tarumai is gently inflating in these four years. Uplifts at bench marks, which are located within a radius of the five kilometer from the central summit dome, are explained by the isotropic expanding pressure source. It is inferred that the best suited pressure source is situated at the c.a. 2.9km depth beneath the central summit dome and its volume increase is estimated about 1.9*10^5m3 between August 1997 and October 2001. The source of the inflation can be interpreted by magma supply from the deeper part, because the temperature at a summit craterlet called A-crater maintains more than 600 degree centigrade and the fumarolic activity at the summit dome holds high level in some years.

Bench marks, which are apart more than five kilometer from the summit dome, are also uplifted locally. The local upheaval can be explained with the same type model as the former one. It is presumed that the most suitable pressure source is located at the northeastern foot of Mt. Tarumai at the depth of c.a. 0.6km and its volume increase is estimated about 8*10^4m3 between August 1997 and October 2001. But the source of this inflation cannot be discussed now without other information and surveys.

The inflation of the volcano are also observed by other surveys (EDM, tilt leveling and GPS) on and around Mt. Tarumai in the last twenty years. And this is the first time that the inflation detected by leveling survey at Mt. Tarumai. At Mt. Hokkaido-Komagatake, which took some small eruptions since 1996, similar inflation was observed before those eruptions. It is important that Mt. Tarumai has to be made much careful observations continuously.

I am much appreciating to Geographical Survey Institute for the measurement at our bench marks and offering the leveling results of them in 2001.