

## Seismic Experiment on New Mountain formed by the 2000 eruption of Mt. Usu

# Hiromitsu Oshima[1], Shin'ya Onizawa[2], Hiroshi Aoyama[2], Satoshi Matsumoto[3], Yoshikazu Matsubara[4], tsuneo tsuchida[5], Tomoko Sasaki[6]

[1] Usu Volcano Observatory, Hokkaido Univ, [2] ISV, Hokkaido Univ., [3] SEVO, Kyushu Univ., [4] Tsukuba R&D Center, OYO Corp., [5] OYO Corp, [6] OYO Sapporo

The 2000 eruption of Mt. Usu took place on Konpirayama and on the western foot of Nishiyama. Upheaval of ground on the western foot of Nishiyama, which implies magma intrusion, lasted up to the early September 2000.

To explore the intruded magma, we carried out the preliminary refraction and reflection seismic experiment on the new mountain in 2000. The reflection profile revealed clear reflective horizon showing shape of ship bottom around the sea level (about 200m deep below ground surface of the new mountain). There is a weak uplift of the reflector beneath the central part of the new mountain, which suggests magma intrusion. Linking to the seismic exploration on Mt. Usu by Research Group for Seismic Exploration on Usu Volcano in November 2001, we conducted seismic experiment on the new mountain to verify the subsurface structure.

The refraction and reflection experiments were implemented along NS trending profile crossing the new mountain as same as the 2000 experiment. In refraction experiment, we deployed 4.5 Hz or 5.5 Hz vertical geophones with spacing of 15m along the profile. We detonated 10-25 kg of dynamite at 5 shot points on profiles and recorded seismic signals from geophone at the sampling rate of 500 Hz by DAS-1. In the reflection experiment, we deployed geophone string that consists of six 10 Hz seismometer with spacing of 15m along the profile. We detonated 400g of dynamite in two holes (1m deep) at 30 m intervals and recorded seismic signals from geophone strings at the sampling rate of 500 Hz by DAS-1.

The tomographic image for refraction data revealed deeper structure in comparison with the 2000 experiment. A noticeable feature of the image is the presence of basin structure beneath the new mountain, which corresponds to the reflective horizon derived by the 2000 reflection experiment. In addition to the horizon, three new reflective horizons were revealed by the reflection experiment. Upper two horizons are clear through the profile, whereas lower two horizons are obscure except for the central part of the profile. Discontinuities of upper two horizons are recognized below the new mountain. which suggest the presence of a fault associated with formation of the new mountain. The preliminary analysis can not provide us any structures that imply the intruded magma. Careful analysis for the data is, however, required because the gravity change suggests the magma intrusion.

Acknowledgements: We are grateful to people around the new mountain for their help though this experiment. Thanks are also due to Abuta Town for his support.