

## Seismic exploration around Izu-Oshima volcano in 2009

Group of Izu-Oshima seismic exploration in 2009<sup>1</sup>, Yuichi Morita<sup>1\*</sup>

<sup>1</sup>ERI, Univ. of Tokyo

We carry out seismic exploration around Izu-Oshima volcano in central Japan to reveal the velocity structure beneath the volcano. We deploy 39 ocean bottom seismometers (OBS) at the interval of around two kilometers along the survey line that directs WSW to ENE. The line passes through Izu-Oshima island and the central summit of the volcano. On the island, we also deploy around 300 seismometers with spacing of around 50m. Total length of the survey line is approximately 60km. For the controlled sources, we explode dynamite of 300kg at 9 points along the survey line below sea level. In addition, we also use pressure source (air gun: capacity 50 liters) around the coast of the Izu-Oshima island and along the survey line.

We have already practiced the exploration around the volcano in 1999, in which the survey line directed NW to SE. It was almost perpendicular to the present survey line. Joining with the data from 1999 exploration, we will try to reveal the velocity structure beneath the volcano in detail. The seismic velocity structure beneath volcanoes is one of important factors to define magma storage system. Magma migrates upward from the deeper source and settles at the depth of the neutral buoyancy where the density (i.e. velocity) gap probably exists. From the geodetic observations at Izu Oshima volcanoes, magma actually stores at the depth of several kilometers beneath the caldera and causes intermittent ground inflation with highly seismicity every a few years. Because the area of the land around the volcanoes is not wide enough to deploy the GPS receivers widely, we can not determine the depth of the inflation source precisely. The velocity structure inferred from the seismic explorations is very important to speculate the magma storage system beneath volcano.

The shot gather traces from land-installed seismometers are completed, but those from OBS are under processing. We will arrange the complete data set including data not only from land-installed seismometers but from OBS and will present the velocity structure around Izu-Oshima volcano. At present, we have preliminary results listed below.

- 1) Onset of refracted wave from the layer whose depth is around 4km is well recognized on the traces. It is the basement of volcanic edifice and situates convex shape beneath the volcano.
- 2) The SxP waves reflected at the depth of 8 to 10 kilometers are probably observed at focal distance of around 10 kilometers. More systematic analysis is needed to estimate the precise depth of the reflector.
- 3) The area of high attenuation of seismic waves is located around central summit of the volcano. And scattered waves are dominant in high frequency components at the stations located inside of caldera region. It shows that the structure beneath the caldera is very heterogeneous.

We are going to process the data, and will reveal the velocity structure beneath the volcano. From the quality of the data, we will be able to more detailed structure comparing with the results from 1999 exploration.

Participants of this project: Y. Murai, H. Oshima, T. Maekawa, T. Ozaki, K. Ichijo(Hokkaido Univ.), S. Sugawara(Hirosaki Univ.), T. Tutsui, T. Kono (Akita, Univ.) S. Ueki, H. Suzuki, K. Suzuki, T. Suzuki (Tohoku Univ.), H. Watanabe, Y. Morita, M. Shinohara, K. Mochizuki, T. Yamada, J. Oikawa, T. Shinbo, Y. Machida, N. Osada, H. Tsuji, A. Watanabe, C. Fujita, H. Abe (Univ. of Tokyo), T. Sato (Chiba Univ.), H. Nakamichi, T. Michisita, T. Mori (Nagoya Univ.), T.

Ohkura, K. Tameguri, S. Yoshikawa, M. Tada (Kyoto Univ.), K. Uehira, K. Uchida (Kyushu Univ.) H. Miyamachi, H. Yakiwara, S. Hirano (Kagoshima Univ.)

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