

The visualization of velocity structure and magma distribution from upper mantle to upper crust in Hakone volcano.

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Three-dimensional seismic reflection and refraction survey was carried out in Hakone volcanic area, northern part of Izu peninsula. The region is one of the most famous hot spring areas in Japan. Hakone volcano morphologically resembles one big caldera. However, the depression of the volcano consists of several small calderas which has been formed by multiple eruptions.

Although sprouts of fumarolic gas and steam are identified in a few areas of the volcano, there is no historical record of volcanic eruption.

Main purpose of our study is to determine the 3-dimensional deep velocity structure around the volcano using the seismic tomography processing. We deployed 44 sets of temporal offline seismic stations and a line of multi-channels seismic reflection survey cable. The seismic waves generated by some natural earthquakes and 14 dynamite explosions were observed, and their data were processed for tomography. The observation coverage was 20 km in diameter. Our result demonstrates the usefulness of high dense seismic observation in identifying and locating low velocity zones beneath the particular area.

According to our tomography, low velocity zone was identified only in surface layer of the old caldera part of the volcano. We could not identify any remarkable reflector in deeper crust, as the result of wide-angle reflection survey using explosive shots. Moreover, we could not identify any other low velocity zone as far as 32 km depth by incorporating the results of other study. In other words, we think that magma is no longer supplied to Hakone volcanic area.