

Feasibility Study-Type Research for Consulting on New Volcano Disaster Risk Reduction

Background and Purpose

For disasters caused by volcanic activity, which is said to have become active after the 2011 off the Pacific coast of Tohoku Earthquake, we are conducting feasibility studies on volcanic disaster prevention and mitigation that can be considered from the perspective of human life protection and structural conservation.

We conducted microtremor observations on a volcano with a single peak and examined its vibration characteristics. We used the H / H spectrum ratio, which is the summit and hillside divided by the spectra recorded at the same time near the foot of the mountain.

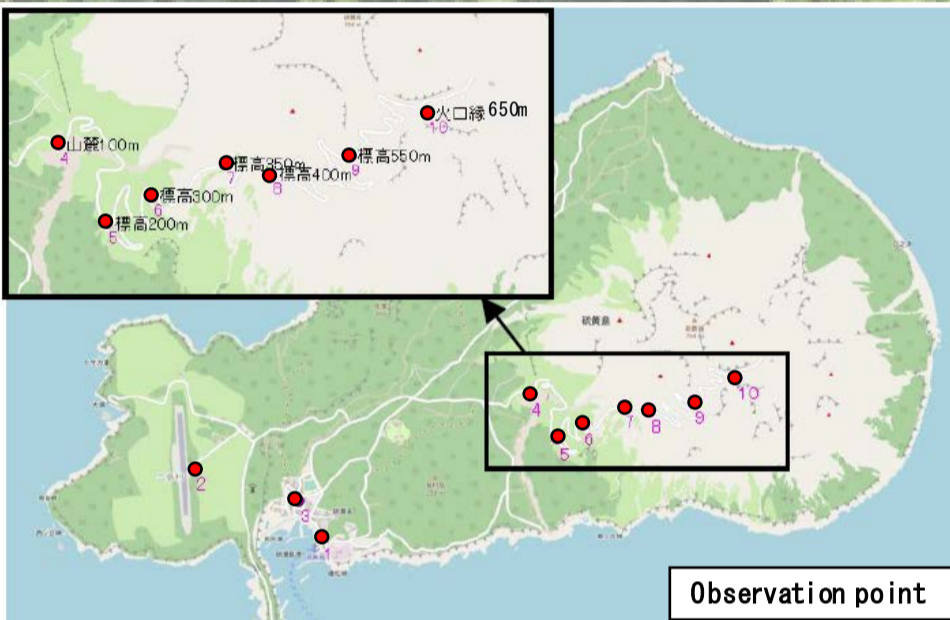


Kaimondake



Iodake

Iodake (Satsuma-Iojima)



Observation point

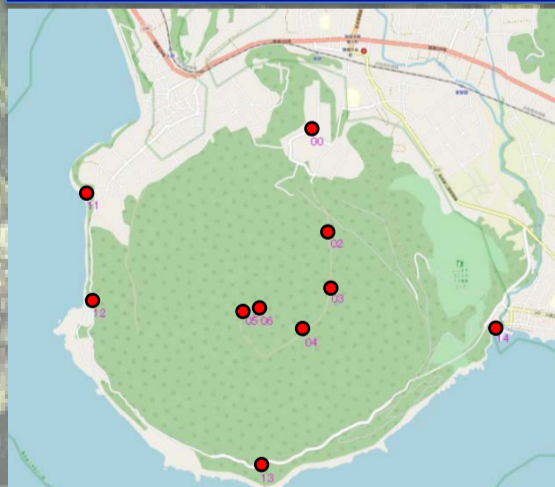


Microtremor used



Observation status

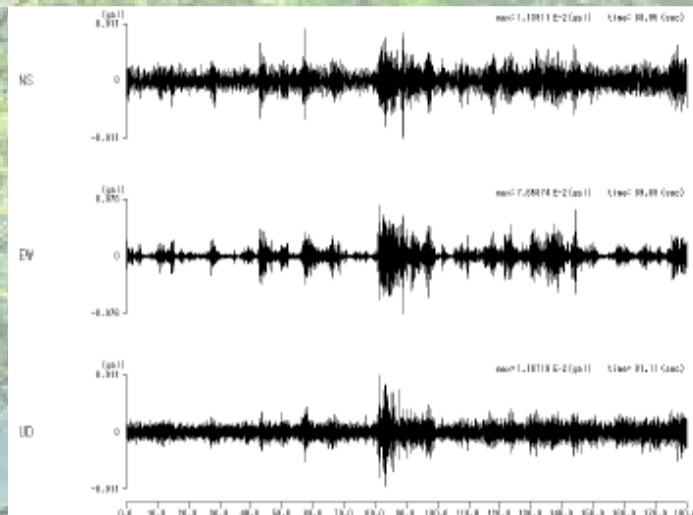
Kaimondake



Observation point

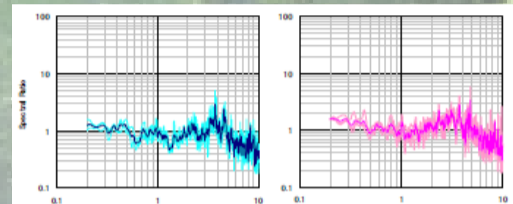


Observation status



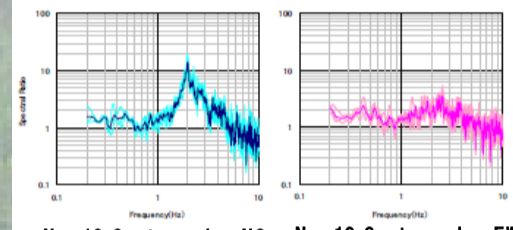
An example of observation record

- ◆ The peak frequency is higher in the order of No. 5, 6 and 7.
- ◆ At the No. 10 crater edge, on the contrary, the peak frequency drops to about 2 Hz.
- ◆ There is no shaking of the mountain as a whole near the crater. A part of the crater edge tended to shake.
- ◆ A small earthquake can be seen in the time history waveform. It can be seen at 100m to 550m stations, but not at TOP stations. There may be some structural changes during this time.



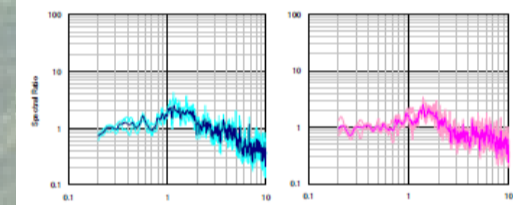
No. 7 Elev. 400m NS

No. 7 Elev. 400m EW



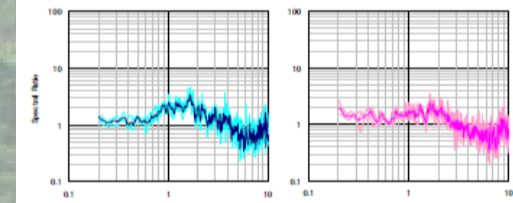
No. 10 Crater edge NS

No. 10 Crater edge EW



No. 5 Elev. 200m NS

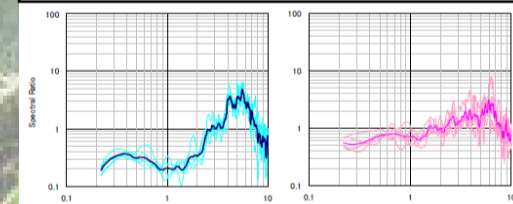
No. 5 Elev. 200m EW



No. 6 Elev. 300m NS

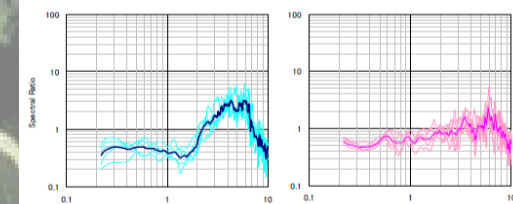
No. 6 Elev. 300m EW

H/H spectrum of Iodake (No. 4)



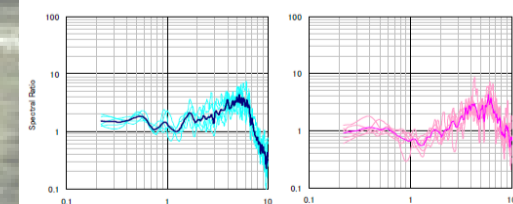
No. 02 Elev. 300m NS

No. 02 Elev. 300m EW



No. 03 Elev. 450m NS

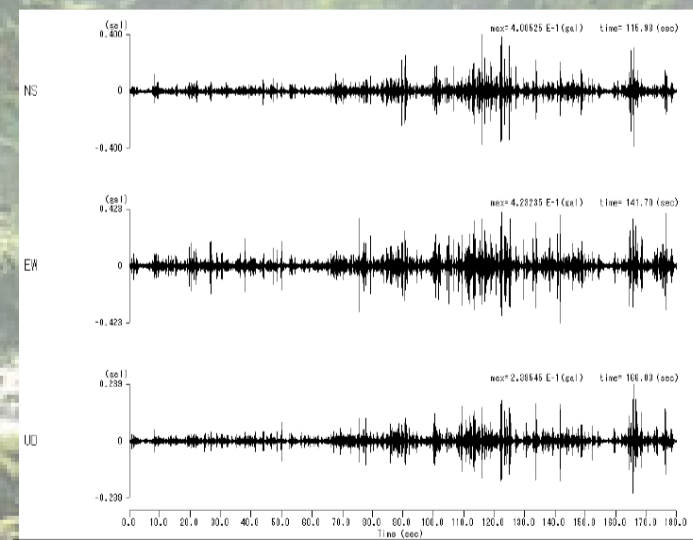
No. 03 Elev. 450m EW



No. 06 Elev. 900m NS

No. 06 Elev. 900m EW

H/H spectrum of Kaimondake (No. 10)



An example of observation record

- ◆ At Kaimondake volcano, peaks can be seen around 6Hz at observation points near 300m, 450m, and 900m.
- ◆ Unlike Iodake (Satsuma Iojima), the peak frequency tended not to change depending on the altitude.
- ◆ The area around 900m in No. 06 corresponds to the summit, but there was no particular tendency to differ from the observation points on the hillside. It is possible that one of the reasons is that there is no large crater like Iodake (Satsuma Iojima).

Future tasks

- ◆ In the future, it is important to consider adding observation points and to mention the mechanism of this vibration characteristic by simulation.
- ◆ At the request of researchers and practitioners, it is possible to provide raw data in win format for observations of Iodake (Satsuma Iojima) and Kaimondake.