

Seismic activity of Izu-Torishima volcano after the eruption of 2002

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Izu-Torishima (N30:29' E140:18') is a circular volcanic island of about a diameter of 2.7km to be located in approximately 300km south of Hachijo-jima Island. There are two central cones (Ioyama; 394m, and Komochiyama) in the outer caldera of a diameter of 1.5km. The double stratovolcano consists of basalt-andesite lava. It is very famous that 125 all of the island people died of large eruption in August, 1902 and there were big eruptions also in 1938. Earthquake swarms occurred many times afterwards, but because the JMA weather observatory is closed on the occasion of earthquake swarm of 1965, it becomes an uninhabited island, no regular seismic observation is made. Torishima Island becomes the breeding ground of Short-tailed Albatross and Japanese Murrelet appointed to endangered animals. Recently they are protected carefully, and the number of individual increases by degrees.

It was witnessed white smoke on August 8, 2002 by a peripheral fishing boat, and also a bright red column of flames rising from the summit of a mountain in the early morning of 10th. On 12th the activity changed in magma eruption, and a condition of eruption was clearly recorded at an albatross monitor camera installed by cooperation of NTT DoCoMo. The Japan Coast Guard identified that the volcanic activity damped on 14th, and smoke activity stopped on 21st.

Albatrosses stay in the island during from October to June, so there was not the direct damage of this eruption. However, because bird researchers have to visit the island for conservation activity, monitor of volcanic activity is necessary for security.

So we buried a vertical component seismometer of peculiar period 2Hz (Mark Products L-22D) in depth of 40cm of scoria layer near the old weather observatory in the west coast of Torishima Island. And we installed a telemeter able data logger (Hakusan LS-7000) to monitor the earthquake activity from October 11, 2002. The observation spot is about 1200m away from the active crater. Solar batteries installed for the monitor camera were used for power supply of the logger. For earthquake data transfer we use a satellite cellular phone (NTT DoCoMo WideStar), which are also installed for the monitor camera.

A lot of earthquakes were recorded since observation start, but the amplitude of the biggest earthquake recorded was only 40mkineP-P, that is equivalent to that of a small felt earthquake. An earthquake considered as B type occurs once for two or three days, but there are a more little type earthquakes. In addition, a volcanic tremor is not observed, too. In this way seismic activity is very low in Torishima, in spite of not passing from the eruption for two or three months.

However, small low-frequency vibrations (3-4Hz, duration of 4 sec) are often observed. There is the day when the vibration is not observed at all, but sometimes vibrations more than 100 are recorded, these ups and downs look to have a period for around 10 days. In addition, these wave patterns are almost the resemblance, we think these vibrations show some volcanic activity, but the details are indistinct. Reinforcement of observation will be necessary in order to investigate a cause of these vibrations.