

Crustal Deformations of Izu-Oshima Volcano after 1986 Eruption: Aftereffect of 1986 Eruption and Refill of Magma Chamber

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In Oshima, expansion of the volcanic island is observed since the beginning of the start of GPS measurements starting in 1994. The expansion is being accompanied by a transient episode due to the crustal activity around Miyake-jima and Kozushima in the summer of 2000. The observed expansion before the summer of 2000 can be explained as an inflation of a magma chamber at the depth of about 4km beneath the center of the caldera. From July to October 2000 the large large-scale crust activity in the northern part of the Izu Islands starting with the Miyake eruption, the expansion of Oshima stopped and the trend changed to stagnation or slow contraction for about one year and a half. In October 2001, the distance started to expand again.

The change of the baseline length is tied by the expansion; there is a component of fluctuation. There is a tendency the expansion accelerates around July and stops in winter. It is interesting to note that the seismicity also has such a tendency. The monthly count of numbers of earthquakes from 1995 shows that in summer the seismicity increases. It is also noteworthy that seismic activity was also calm from the summer 2000 to the autumn of 2001 when no expansion was observed by GPS and both expansion and seismicity are observed since the winter 2001.

It is suggested that the expansion of the island is driven by the inflation of magma chamber and the fluctuation of inflation causes the episodicity of crustal deformation and seismicity

According to the observation result for 1992 to 1998 years of a synthetic aperture radar, it turns out that in Oshima two kinds of deformation are on-going. One is expansion of the whole island and the other is subsidence of the caldera.

We should note that a localized subsidence is also seen around C craters of 1986 eruption and the center of the caldera subsidence is located around the B craters of 1986 eruption.

It is also suggested that stress field caused by inflation of magma chamber is of extension nature and it causes subsiding process of dike, which was formed during 1986 eruption whose density is higher than the circumference medium. Furthermore, another subsidence in the southeastern part of the island found by the leveling may suggest the intrusion of a dike close to the surface during 1986 eruption as suggested by Endo et al. (1987).

Bibliography

S. Endo, T. Kamai, T. Kadoi: The surface s formed in Izu-Oshima volcano during 1986 eruption (in Japanese), the Geological Survey of Japan monthly report, 38 and 11, and pp649- 658, 1987.