

Recent geomagnetic variation of Miyakejima Volcano

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<http://hakone.eri.u-tokyo.ac.jp/vrc/kagiya/index.html>

A release of much amount of volcanic gas goes on after September, 2000, and it is important to know physical conditions under the crater in Miyake-Jima Volcano. Electromagnetic research group of Miyake-Jima Volcano has extensively established a transmitting system of the total force of geomagnetic field. The observation points which were 3 points at the end of 2000 are 7 points in February, 2001, and 4 more points are increased. This presentation shows the result of extensive analysis after the accumulation of the data on one year.

As for a standard point to discuss a change in geomagnetic field, it is required that there are a few lack of observation and the outer effect of the geomagnetic change looking alike as an investigation object. It was found that Kamitsuki station in the northern foot of Miyake-Jima Volcano was suitable for a standard point as a result of examining.

A change in a geomagnetic field caused by a change of the way of Kuroshio often appears in a change in geomagnetic field of Miyake-Jima, and makes it difficult to detect a change in the volcanic activity origin. A change in Shinmio-Ike-Ato station in the southern coast of the island was the largest in Miyake-Jima, and correlation was recognized between other observation points as a result of examining a change occurred in August, 2001. The amplitude ratio of the change with Shinmio-Ike-Ato station is bigger in the southwestern part of Miyake-Jima, and smaller in the northeastern side. The Kuroshio effect is successfully eliminated by this correlation using the change in Shinmio-Ike-Ato station.

After the correction of Kuroshio effect, an annual variation is recognized in most stations. This variation is caused by the annual change of the ground temperature, and depends on the inhomogeneity of the magnetic structure in the neighborhood of the observation site. The amplitude of this annual change is about 4nT in Tairo-Ike-Kita station, 0.8 nT in Tejima-Bokujo station, and 3.5 nT in Rest House and Sonei-Bokujo stations.

After a correction of annual change, no anomalous change is recognized in Tairo-Ike-Kita station after February, 2001, and increase of 1nT is found in Tejima-Bokujo station. Decrease of 8nT in Sonei-Bokujo and decrease of 1nT in Rest House station were also found. Though it was the decrease of 8nT in recent one year, a change in the total force of geomagnetic field in Sonei-Bokujo station doesn't decrease monotonously; an increase in 1 - 2nT was recognized from late March to April in 2001, for example.

These results indicate that temperature in the shallow part beneath the crater has been increased in recent one year, but this change isn't monotonous, but for example temperature can be thought to decrease temporarily from late March to April, 2001.