Project ASO98(Seismic explorations): Observation of volcanic tremor around active crater

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Seismic exploration was carried out intended for around central cones of Aso volcano on November 26, 1998. In this seismic exploration, the array observation was carried out at observation point intervals of 20m in the west and the northern part of the crater. In addition, a high density observation of 60 points is carried out at observation point intervals of about 100m around active crater. In these observation points, six artificial earthquakes were recorded, and the seismometry of about two hours in total was carried out until tomorrow morning. The purpose of this seismometry is determination of the epicenter of isolated volcanic tremor frequently generated by active crater and the wave motion propagator characteristic.

There is no surface activity of the Aso volcano after the mud eruption (phreatic explosion) in 1994, and the first crater bottom is in the state of hot pool. The activity of volcanic earthquake and volcanic tremor is generally low in a calm volcano. However, isolated volcanic tremor has happened frequently for a calm period after 1994 in the Aso volcano. The activity of these tremor changes depending on time. About ten tremor every one hour usually occurs.

This volcanic tremor can be classified into four kinds of the following based on the cycle.

(1) 6Hz tremor
(2) High frequency tremor (8-12Hz)
(3) Low frequency tremor (1-3Hz)
(4) Long-period tremor (ten seconds)

The high frequency tremor and the long-period tremor occur regularly after 1994. 6Hz tremor is occurring only in 1995, and the low frequency tremor occurs in the high frequency tremor by accompanying since the end of 1997. No determination concerning the high frequency tremor and the low frequency tremor by the scale of tremor small though the epicenter of 6Hz tremor and the long-period tremor has already become clear.

In the Aso volcano artificial earthquake project which had been done on November 26, 1998, about 60 observation points were set up around the Mt, Nakadake crater by 100m space. Moreover, the array observation at 20m space was carried out by Furuboutyu (west of the crater) and the rope way Kakouhigashi station (northern part of the crater). The set record time of recorder (LS8000SH) of the observation point in the Mt, Nakadake crater region has been extended though the purpose of this observation is a record of an artificial earthquake. We work on the elucidation of determination of hypocenter and the wave motion propagator characteristic of high frequency tremor (8-12Hz) and low frequency tremor (1-3Hz) by using the extended record.

The record time becomes the description two hours or less, and the number of excellent volcanic tremor is about 10. In the result of a rough analysis, the epicenter of the high frequency tremor is west of the third crater. This position is on the epicenter of the long-period tremor. Because coherence is low, the low frequency tremor cannot examine the epicenter closely. However, the wave was found to be apparent velocity of 2.5km/sec from the direction of the crater from the analysis of the array data of Furuboutyu.

In this announcement, the result of the volcanic tremor observation in the Aso volcano artificial earthquake project in 1998 is introduced . And, the source of the volcanic tremor of the Aso volcano after 1995 and the characteristic are considered.