

## 浅間火山 2004 年噴火に関連した噴煙の時間変動

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## Time Variation of Volcanic Plume Related with the Eruptions of Asama Volcano in 2004

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Asama Volcano had a series of eruptions from September 1 to November 14, 2004. We have carried out infrared observation at the eastern foot of the volcano since August 2002, and have succeeded in capturing successive plume imageries. We examined long term and short term variation in volcanic plumes related with the 2004 Eruptions.

We examined long term variation of the plume height from January to November 2004, and found two different kinds of correlation between the plume height and other volcanic activities; the increase in plume height followed by the eruption with a long time delay, and that followed by the eruption promptly. The plume height turned to increase gradually in March and May with the increase of the A-type earthquakes and gradual inflation suggesting supply of magma in the deeper part, and the height increased anomalously from July 25 with rapid inflation suggesting magma migration to the shallower part. These anomalies were followed by the first eruption on September 1 about 40 days after. Erupted products included some juvenile materials, but the major part of the products were lithic materials. The plume height became lower just after the eruption, but turned to increase from September 12 following the increase of A-type earthquakes. The second eruptive stage started from September 14, 2 days after the increase of the plume height. Three small eruptions occurred on September 14, and many small eruptions occurred successively from September 16 to 17. The erupted products were mostly well vesiculated juvenile materials. This evidence suggests that the eruptions in the second stage occurred with much volcanic gas, while the first eruption occurred after degassing from magma.

We examined short term variation of the volcanic plume during the developing stage of the successive minor eruptions; from 00:57 a.m. to 08:00 a.m. on September 16. We got time series data of the average temperature on the certain vertical line segment, which is crossed by moving volcanic plume, and examined spectrums. As a result of analysis, some power peaks were confirmed at the multiples of 0.0025 Hz until 4 a.m. And this peak was found to move to higher frequency according to the eruptive activity; 0.0032 Hz at 7 a.m. One possible reason is that Asama Volcano has some resonance beneath the crater (conduit), and the characteristic length of the conduit changed to be shorter during the successive minor eruptions. Japan Meteorological Agency reported the number of eruptions increased from 4 a.m., and Geographical Survey Institute found a lava cake within the crater about 11 a.m. These evidences suggest that magma ascended within the conduit around 4 or 7 a.m., and may be consistent with our analytical results.

**Key words:** Asama Volcano, eruption, volcanic plume

## 1. はじめに

火山の噴煙を描写する時、しばしば「もくもくと上昇

する」という言い方をする。噴火の映像を見ると、蒸気機関車の息づかいのようにもくもくと噴煙が上昇してい

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