[JJ] Evening Poster | S (Solid Earth Sciences) | S-VC Volcanology

[S-VC41]Active Volcanism

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Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
This session discusses various aspects of active volcanisms including, but not limited to, recent and historical eruptions, various phenomena associated with the volcanic activities, underground structures of the volcanoes, and developments of new instruments based on geophysical, geochemical, geological, and multidiscipline approaches. We also welcome studies on understanding and predicting the transitions of the eruptive activities from observational, theoretical, and experimental approaches.

[SVC41-P15]Numerical simulations of ash fall prediction on the eruption at Niigata-Yakeyama Volcano in 1974

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1. Introduction
Niigata-Yakeyama Volcano, located in the western part of Niigata Prefecture, is one of the active volcanoes in Japan. After Meiji era, volcanic activities, accompanying fumarolic activities, lahars, and small phreatic eruptions become high repeatedly. Phreatic eruptions in 1949 and 1974 especially affected the base of the volcano. In JRA-55 datasets produced by the Japanese 55-year Reanalysis, which covers since 1958, the 1974 eruption is just one example with larger eruptive volume. We report the results of ash fall simulations on 1974 eruption based on the meteorological field made from Japan Meteorological Agency Non-Hydrostatic Model (JMA-NHM).

2. Analysis
The method of ash fall simulations is roughly as follows (Shimbori et al., 2014). First, we made up the plume column model which consists of large amount of particles (tracers). Meteorological field necessary for simulations is downscaled by JMA-NHM from JRA-55, and behavior of each particle are calculated by using JMA-RATM (Regional Atmospheric Transport Model), given the onset and duration of the eruption, plume heights, distribution of particle sizes, and so on.

3. Results
Comparison among the ash fall distributions for each plume height indicates that plume heights with more than 5,000 m (above the crater) can explain ash falls in the far-field (Fukushima Prefecture; approx. 140 km from the volcano). Moreover, it was estimated that ash fall in the far-field described above was derived from the 8-9 km a.s.l. (approx. 6-7 km above the crater), which is consistent with the results of simulations.

4. Summary
Ash fall simulations agreed well with the observed ash fall distribution, implying that the reproducing the sequence of 1974 eruption is possible. We suggest that the scale of eruption is roughly estimated from ash

fall distribution, even if detailed plume condition is unknown.
The results of simulations should be applied effectively on the judge criteria of eruption alert level and the eruption scenario. We also conclude that countermeasures for ash fall are available for local authorities. Moreover, we expect that simulating some events whose details of eruption activity is not known clearly, such as 1962 eruption at Niigata-Yakeyama contribute to the assessment of volcanic activities more precisely.