

## Quantitative Tephra Fall Predictions of the Eruptions at Sakurajima Volcano in 2009

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The tephra fall forecasts by the Japan Meteorological Agency (JMA) have been disseminated six times from 31 Mar. 2008 to 31 Jan. 2010. In 2009, four explosive eruptions with the ash plume height over 2500 m above the crater rim occurred at Sakurajima volcano (the corresponding eruption cloud echoes were detected by Doppler weather radar at Tanegashima) and tephra fall forecasts were disseminated for three of four eruptions at the Showa crater on Apr. 9 06:31UTC, May 30 11:23UTC and at the Minamidake summit crater on Oct. 3 07:45UTC. Each height and current direction of ash plume observed by high-sensitivity camera was over 4000 m SW, 2500 m SE and 3000 m straight up, and heavy volcanic ash fell in Kagoshima City on 9 Apr. 2009. The ash-fall areas predicted by the tephra fall forecasts were almost right in comparison with observations for the events of 9 Apr. and 30 May, 2009. However, for the event of 3 Oct. 2009, the forecast did not predict well. In this presentation, we report the verification of three tephra fall forecasts of Sakurajima volcano in 2009, and study cause of the wrong prediction in terms of the following points: (i) the process of volcanic-ash fallout, (ii) the forecast time (six hours from the time of eruption, operationally) and (iii) the effect of local wind which cannot be represented by the hourly outputs of the JMA Mesoscale Model (MSM).

In the Meteorological Research Institute (MRI), the technical methods of quantitative forecasting of ash-fall depth have been researching. At 2009 Fall Annual Meeting of the Volcanological Society of Japan, we reported the quantitative tephra fall prediction of the eruption at Asama volcano in 2009. In this presentation, we also report the application to the cases of Sakurajima volcano in 2009.

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