

Weather Radar Investigation of Volcanic Smoke for Disaster-Prevention

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Sakurajima volcano has been active since February 2009. The total number of explosive eruptions was 966 in 2011, which was the highest number in recorded history. Corresponding to volcano activities, the ash accumulation in Kagoshima city increased and total ash amount of 3,500g/ m² was recorded at Kagoshima local meteorological observatory. Because the volume of volcanic ash in rural area paralyze public ground transportations such as rail road and highway, fast recovery efforts are required to the railroad company and city government. However, no quantitative volcanic ash fall estimation has been established. The present study focuses on utilization of operational weather radar for quantitative ash estimation (QAE), quantitative ash forecasting (QAF), and utilization of crustal movement information for providing ash volume which is necessary for initial conditions of a numerical diffusion model. Although the target volcano of the present study is Sakurajima, the knowledge on volcanic ash and algorithm developed by the present study can be applied to any other volcano which is located in operational weather radar observation area.

Keywords: weather radar, volcanic ash, quantitative ash estimation, Sakurajima, polarimetric radar