

Airborne in-situ measurement of Sakurajima volcanic ash plume with light aircrafts and optical particle counters

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It is clear that the no-fly zone of airplanes during a volcanic eruption has great influence on the economic activity in the respective area, based on the experience during the 2010 eruptions of Eyjafjallajokull in Iceland. When the extent of volcanic ash clouds is predicted from simulation calculations, the airspace may be closed. However, during the volcanic eruption of Iceland, European aviation authorities took the measure which loosens no-fly zone of an airplane according to the concentration of volcanic ash in order to avoid confusion of an air route at an early stage. In that case, the diffusion of volcanic ash clouds grasps viewing or a satellite photograph, and the concentration of volcanic ash is measured by LIDAR (detection by a laser picture) in the ground.

This research firstly aims at grasping the three-dimensional structure of volcanic ash plume by the in-situ airborne ash measurement. The atmospheric diffusion model which predicts the volcanic ash concentration is verified by the comparison between observed and calculated values. The in-situ field is Mt. Sakurajima in Kagoshima where the eruption frequency is high. Moreover, the possibility of usage of the X-band MP radar for measuring volcanic ash clouds is also investigated.