Estimation of Airborne Ash Density using a Real-time Volcanic Ash Dispersion Model PUFF

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A real-time volcanic ash tracking model Puff is applied to Sakurajima Volcano in Japan in order to estimate the airborne ash density. The ash fallout by the Puff model is compared with the in-situ observation around Sakurajima Volcano for one year in 1985, and the particle mass in the model is calibrated to match with the fallout record. The eruption mass flux and the plume height for the Puff model input were estimated from the real-time seismic record with ten minute's interval for one year. Based on the calibration for the ash fallout in Puff model, we have estimated the airborne ash density and its dispersion. According to the result, the airborne ash density is estimated quantitatively for all time and 3D space as a rough first guess. Ash density less than 2 mg/m3 is one criterion for aviation safety. It is shown by the analysis that the ash density above 2 mg/m3 is restricted in a narrow area near the volcano, and the density decreases rapidly to the safe level for the aviation by dispersion of ash particles. The information of the airborne ash density is useful for the real-time aviation safelty.