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Continuous monitoring of volcanic ash falls using Kohai-hyeto meter for Sakurajima volcano

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The Kohai-hyeto meter has been developed by Public Works Research Institute (PWRI) and Nippon Koei Co., Ltd. The total weight of volcanic ash and rainwater is measured using a load cell, which is placed under the container used to collect the volcanic ash and rainwater. The total volume of the ash and rainwater is also measured using the container's water level meter. The weight of the ash and that of the water can be separately calculated on the basis of the measured data. For Sakurajima volcano, we took continuous measurements of the weight of the ash fall using the abovementioned equipment, from April 2008 onward at Arimura and from September 2008 onward at a location near Arimura. This Kohai-hyeto meter was used to observe the weight of the collected ash and rainwater and the collected rainwater level every 10 min; then, these values were averaged for periods of 1 h. The equipment does produce some mechanical noise and irregular data. The noise is indicated by the normal distribution curve obtained during the no-eruption period from November 2008 to January 2009. The standard deviation (1 sigma) is approximately 20 g in this period. Further, the equipment sometimes observed irregular increases in weight from a few hundred to two thousand grams within a period of just 1 h. We consider that this irregularity is caused by interference with the equipment by animals or birds and discard such data. At Arimura, the equipment showed an increase in the ash weight of approximately 18,000 g/m² from January to October 2009.

Keywords: ash weight, continuous monitoring, Kohai-hyeto meter, Sakurajima