The rapid increase of SO_2 emission rate observed in the Aso volcano before an explosive eruption on October 8, 2016.

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Fukuoka regional headquarters, JMA is observing the SO_2 emission rate as one of the data for estimating the volcanic activity at Aso volcano. Although we are observing the SO_2 emission rate about once in one week, depending on weather conditions, the observational data cannot be obtained two weeks or more.

The observational data from August 31 to September 26 was not obtained before the explosive eruption on October 8, 2016 for weather conditions. On September 26 when the volcanic tremor was shifting on the high amplitude level, the SO_2 emission rate increased to 3,100 ton/day. We were worried about the rise of a volcanic activity, and shortened the measuring interval of the SO_2 emission rate. However, the wind velocity and direction around the Aso volcano of the beginning of October were unstable. Additionally, the detection of the high column density more than 2000ppmm made difficult the analysis of the emission rate by the present analysis method.

In this study, the observational data on October 3, 4, 6, and the 7th was re-analyzed using the absorption spectrum for every sample. The accuracy of the SO_2 emission rate improved by creating a calibration curve using a high column density. Although the SO_2 emission rate of the day before explosive eruption was calculated with 15,000 ton/day in the preliminary analysis, average rate became 16,700 ton/day (Max: 20,800ton/day, Min: 11,800ton/day) as a result of the re-analysis. Additionally, it proved that the SO_2 emission rate in the Aso volcano was a clear upward tendency from October. This fluctuation corresponded with the increase in the amplitude level of a volcanic tremor, and the expansion of the ground. It is assumed that a large amount of volcanic gas accumulations at the shallow region of the crater following the rapid increase in the degassing from magma had occurred in the process in which it results at the explosive eruption on October 8.

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