

## Sulfur dioxide flux difference between two craters in Sakurajima volcano by using UV cameras observation system

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The measurement of a volcanic plume is very important from point of view of volcanology and disaster prevention. Volcanic-gases are good indicator for volcanic activity. They cause health hazards and give impact on environments. SO<sub>2</sub> in volcanic plume can be observed remotely by COSPEC or compact UV spectrometer. They measure SO<sub>2</sub> column amounts using UV absorption of SO<sub>2</sub> around 310 nm. But these instruments can only measure the part of the plume and hardly capture whole plume without scanning. To solve this problem, the UV camera observation system was developed (Mori and Burton, 2006; Bluth et al. 2007).

This method can observe not only SO<sub>2</sub> column amount distribution in the plume but also plume speed and even SO<sub>2</sub> flux with frequencies of order 1Hz. Also if the volcano has multiple vents, this method can reveal the difference of the degassing activity of respective vents. However, since UV camera can measure only light's intensity of specific wavelength not UV spectrum, it is more susceptible to an observational condition (e.g. Weather, humidity and intensity of the sky light) than UV spectrometers.

In this study, we improved visualization techniques for SO<sub>2</sub> of Mori and Burton (2006) and show the results of visualization measurements carried out at Sakurajima volcano, Japan.

The scattering between the instrument and the plume, which might cause a significant underestimation of SO<sub>2</sub> column amount (Mori et al. 2006), could not be evaluated in Mori and Burton (2006). This scattering effect was corrected for the SO<sub>2</sub> image by considering spectroscopic data obtained by the UV spectrometer.

On May 7 and May 8, 2008, we carried out SO<sub>2</sub> visualizing observation at Sakurajima volcano, Japan, using the improved method. Sakurajima volcano currently has two active craters; Minamidake crater which located at the summit and Showa crater which located on eastern upper flank of the volcano. Our measurement revealed the difference of the degassing activity between different craters. On May 7, The ratio between The average of flux contributed by Minamidake crater (Minamidake flux) and that by Showa crater (Showa flux) was 4 to 5. In contrast to the result of measurement on May 7, the ratio between Showa flux and Minamidake flux was almost 1 on May 8. In addition, Showa crater had explosive eruption after the observation on May 8. Therefore, it is possible that the dramatic change of the ratio between Showa flux and Minamidake flux might be the precursor of the volcanic eruption. For understanding the volcanic degassing activity of each crater and their relationship, the consecutive measurement is desired.