Observations of volcanic eruption columns using Himawari-8 Super-Rapid Scan 30-sec imagery

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Japan Meteorological Agency (JMA) began operation of the new-generation geostationary meteorological satellite, Himawari-8, on 7 July 2015. The imager on board is called Advanced Himawari Imager (AHI), whose observation performance is highly improved compared to that of the predecessor geostationary meteorological satellites MTSAT-series. For example, the number of observation bands is increased from 5 (1 visible band and 4 infrared bands) to 16 (3 visible bands, 3 near-infrared bands, and 10 infrared bands), the spatial resolution is almost doubled (1 km to 0.5-1 km for visible and near-infrared bands and 4 km to 2 km for infrared bands), and the full-disk observation frequency is improved from hourly to every 10 minutes. Furthermore, for the small regions including Japan (two areas coverage of the 2000 km (E/W) and 1000 km (N/S) rectangle over the North-Eastern and South-Western Japan) and a target area (1000× 1000 km), high-frequency observation as much as every 2.5 minutes is carried out. These high-resolution and high-frequency data enable us to observe relatively small-scale and quickly changing phenomena, such as volcanic eruption clouds. The increase in number of the observation bands improves the capability of volcanic ash clouds detection and estimation of various parameters, such as amount and particle size of ash (Hayashi *et al*. 2016), and can be expected to estimate an amount of sulfur dioxide in volcanic clouds. Furthermore, the imagery at two Landmark areas of the 1000 km (E/W) and 500 km (N/S) rectangle can be obtained at every 30 seconds (Super-Rapid Scan observation). The main purposes of this observation are the navigation of satellite, image registration, and moon observation for calibration of AHI (Bessho *et al*. 2016). In recent times, the landmark areas are used experimentally for observation of phenomena such as rapidly developing cumulonimbus clouds and volcanic eruptions, and these set at the areas which contains the active volcanoes such as Sakurajima, Aso, and Asama volcano.
We start the study on the dynamics of eruption columns just after the start of eruption by using the Super-Rapid Scan data. In this paper we talk about the comparative studies of Himawari-8 band 3 (0.64 μm, spatial resolution 0.5 km) Super-Rapid Scan imagery of the eruption column of Sakurajima volcano with the observational data obtained by weather radars (Sato *et al*. 2017) and video data captured by volcano monitoring cameras of JMA.

Reference

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