

Observation of eruptive activities in the Asia-Pacific region in 2017 using infrared images of Himawari-8

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We developed satellite-based monitoring system using Himawari-8 AHI (Advanced Himawari Imager) and MODIS and have been observing 168 active volcanoes in the Asia-Pacific region. Himawari-8, carrying a newly developed sensor AHI, can be used for thermal analysis, because of the improved resolution (2 km) in the infrared channels. The high observation frequency, every 10 minutes, is particularly useful for thermal analysis of eruption sequences, which include events to occur within a short period, such as explosions or collapsing. Based on the monitoring system using Himawari-8 AHI, we observed more than ten small to medium-scale eruptions in the Asia-Pacific region in 2017, such as in Sinabung, Nishinoshima or Aoba volcanoes. By examining these results, we could recognize some close relationship between eruptive modes and patterns of temporal variation of thermal anomaly. Effusive activities involving Strombolian lava fountain show near-constant gentle variations on the long-term observation (one year) and near-constant values on the short-term observation (twenty-four hours) as well. This suggests that lava effusion is very constant. On the other hand, effusive activities of high-viscosity lava show patterns consisting of scattering values on the long-term observation, and asymmetric pulses (rapid-increasing and gentle-decreasing) on the short-term observation occasionally. These asymmetric pulses are considered to be caused by rock-fall events related to the collapse of a part of the lava dome or thick lava flow. We also analyzed the 2017 Nishinoshima activity in conjunction with high-resolution infrared images from Landsat-8. In December 2017, JAXA had successfully launched the new Global Change Observation Mission-Climate (GCOM-C) satellite, carrying Second Generation Global Imager (SGLI). We are also developing a system using GCOM-C SGLI images to enhance the observation capability for volcanoes.

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