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**Automatic Detection for Volcanic Ash Distribution using
Geostationary Satellite Observation by Machine Learning**

Richard Mahendra Putra

Indonesia Agency for Meteorology Climatology and Geophysics

One of the most dangerous factor to the aviation is volcanic ash phenomena. Beside it causing accidents, the distribution of volcanic ash can also affect climate change. Information on the distribution of volcanic ash is very important to increase the safety of aviation activities. At present condition, information for volcanic ash distribution is done by interpreting satellite images using the Composite RGB method. In this product, satellite imagery will have several colors that need to be interpreted such as Cloud free land (Shades of blue or pink depending on the temperature and water vapor content), SO₂ gas plume (Shades of bright green depending on the concentration), Thin volcanic ash (Shades of red depending on the concentration), Mixed ash and SO₂ gas (Shades of yellow depending on the concentrations) and other colors. So forecaster must distinguish the locations that containing volcanic ash using his own interpretation from color produced by RGB Composite in Satellite observation. In this case, differences in knowledge and experience of each forecaster will be the different result of interpretations. The purpose of this study is to make an automatic detection product for the distribution of volcanic ash by Himawari-8 satellite using an Artificial Neural Network Model. The neural network model is train during the Mount Sinabung eruption case study on 19th February 2018 and will be tested in other case studies, namely the eruption of Mount Merapi on 11th May 2018, Mount Rinjani on 3rd November 2015, and Mount Agung on 2nd July 2018. Based on these results, the pattern of volcanic ash distribution is similar to the interpretation of the RGB Composite product of the volcanic

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ash distribution used by the Indonesia Agency for Meteorology Climatology and Geophysics. The Automatic products can immediately distinguish whether volcanic ash or not. In this product, the image shown is only volcanic ash, whereas particles that are not volcanic ash will not be displayed on this case study.