

# Volcanic Ash Dispersion Simulation of Huge Volcanic Eruption with the PUFF Lagrangian Method : A case Study of Tonga Eruption 15 January 2022

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The PUFF Model is a volcanic ash dispersion model used in Indonesia to help predict the distribution of volcanic ash for aviation safety purposes. This model uses the Lagrangian method taking into account wind, diffusion, and gravity parameters. The eruption of Mount Tonga on 15 January 2022 with a volcanic explosivity index (VEI) of 5 which exceeded Galunggung 1982 and Kelud 2014 is an interesting phenomenon to study with the PUFF model because of the relatively large distribution of ash eruptions. Volcanic eruptions with  $VEI \geq 3$  have different characteristics from  $VEI < 3$  which often occur in Indonesia. The simulation is carried out by changing the value of the diffusion parameter in the model and comparing it with satellite imagery to find a suitable value for a large type of eruption. It was found that increasing the value of the diffusion coefficient can increase the accuracy of the distribution of volcanic ash. The accuracy of the volcanic ash distribution area is very significant for flight safety.

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## Promotional text

This research is important for aviation safety in regard to volcanic ash prediction information.

## Oral preference format

in-person

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