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Comment on nhess-2021-270

Anonymous Referee #1

Referee comment on "VADUGS: a neural network for the remote sensing of volcanic ash with MSG/SEVIRI trained with synthetic thermal satellite observations simulated with a radiative transfer model" by Luca Bugliaro et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-270-RC1>, 2021

The study presents the VADUGS (Volcanic Ash Detection Using Geostationary Satellites) retrieval algorithm that uses SEVIRI thermal observations to detect volcanic ash clouds and determine their mass column concentration and top height, through the application of an artificial neural network (NN). This approach requires the compilation of an extensive data set of synthetic SEVIRI observations to train an artificial neural network. One of the most interesting points is that the authors resolve the limited observations on volcanic ash clouds using simulated satellite data. In general, the paper is very well written and the results/conclusions are very interesting. Nonetheless, I feel like the whole manuscript could be simplified and shorten in order to better highlight the novelty of the presented results. The procedure used to simulate satellite observations and the VADGUS retrieval algorithm are well written but could be shorten significantly. I think that there are too many details that can be referred to the cited articles or by moving them to an appendix.

A very good piece of research - well done to the authors for coming up with a novel and useful publication. Hopefully the findings of this paper can lead to better hazard mitigation for volcanic ash clouds.

Well done