

## ***Interactive comment on “Revisiting the Agung 1963 volcanic forcing – impact of one or two eruptions” by Ulrike Niemeier et al.***

**Alan Robock (Referee)**

robock@envsci.rutgers.edu

Received and published: 28 May 2019

The paper presents interesting results, and I recommend it be published after the authors address the points below.

The results in this paper seem correct, but there are several issues discussed in the 50 comments in the attached annotated manuscript that should be addressed. The most important ones are:

1. The 2-eruption scenario changed both the amount and altitude of the sulfur injections. Thus, it is difficult to separate those effects. If you change two things at once, it is harder to understand the causes of the differences. Why not just change the number of eruptions, without changing the altitude, also?

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2. I don't understand how the ensembles were created. The authors said there were two different initial conditions. They did 6 ensemble members. Why did they use 2 different atmospheric states? And what were the states? Did they use actual weather patterns observed at the time of the eruption, from a reanalysis? If not, how they choose them? And why did they only do 6 ensemble members?

3. What SSTs were used? Observations?

4. I would like to see the climate responses compared to each other, and to observations. What about surface air temperature patterns? Precipitation patterns? Northern and Southern Annular Modes? Did the injection strategies produce significant differences?

5. Except for Fig. 3, I did not see any statistics showing the spread from the ensemble members. Rather the authors argue at the end that the differences between different models are larger than then differences shown here between the two forcings. But how do those differences compare to chaotic differences in the climate system? How do weather differences, or differences in initial conditions, or different oceanic responses compare to the differences from different forcings?

Review by Alan Robock

Please also note the supplement to this comment:

<https://www.atmos-chem-phys-discuss.net/acp-2019-415/acp-2019-415-RC1-supplement.pdf>

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-415>, 2019.

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