

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2022-362

Anonymous Referee #1

Referee comment on "How extreme apparitions of the volcanic and anthropogenic south east Asian aerosol plume trigger and sustain: El Niño and Indian Ocean Dipole events, and drought in south eastern Australia. First attribution and mechanism" by Keith Alan Potts, Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-362-RC1>, 2022

Comments on "How extreme apparitions of the volcanic and anthropogenic south east Asian aerosol plume trigger and sustain: El Niño and Indian Ocean Dipole events; and drought in south eastern Australia. First attribution and mechanism using Global Volcanism Program, Last Millennium Ensemble, MERRA-2 reanalysis and NASA satellite data" by Potts et al.

The analysis presented in the manuscript is weak. There are too many results without the support of the analysis. The conclusions made in the manuscript are based on the correlation among data sets and past literature. Many statements in the manuscript are overstated. The manuscript in the current form is not suitable for publication in Atmospheric Chemistry and Physics.

Major comments:

I suggest the author perform the analysis using ESM simulations. Using ESM simulations, past studies have shown droughts over Africa and India, are linked to a volcanic aerosol plume and ENSO events. The mechanism involves aerosols causing the reflection of solar radiation leading to cooling at the surface under the plume. It eventually leads to Kelvin wave dissipation in the Central/Eastern Pacific (Khodri, M. et al., Nat. Commun. 2017, Fadnavis S. et al., Scientific Reports, 2021). The author reports a similar mechanism for drought in the south-eastern Australia region. However, the consequences of volcanic aerosols and the proposed mechanism are based on the correlation among data sets. The atmospheric processes are interlinked hence correlation is a weak tool to show the consequences of volcanic aerosols. To show changes in rainfall, temperature, circulation, etc., caused by volcanic aerosols, the author should perform ESM simulations with volcanoes and without volcanoes.

The 'results' section is weak. It needs to be strengthened.

A schematic depicting the processes involved in connecting SEAP and ENSO will be useful.

The introduction section is lengthy and looks disconnected. Here, the author should give past work, gaps, and the reason for undertaking this study. I suggest the author reduce the length of this section considerably.

The discussion section needs to be re-arranged. Please combine subsections to keep integrity.