

Interactive comment on “Model simulations of the chemical and aerosol microphysical evolution of the Sarychev Peak 2009 eruption cloud compared to in-situ and satellite observations” by Thibaut Lurton et al.

Anonymous Referee #1

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This is a great study. The importance is clear. The authors have done an excellent job with their analysis - I'm quite impressed with the care and thoroughness they have applied to this research. I only have a few minor comments.

Page 2, lines 24-25: I think you're conflating two issues here. I agree that small eruptions at high latitudes would likely have impacts that are confined to one hemisphere. I also agree that large eruptions in the tropics would likely impact both hemispheres. This is not an either-or. What about small eruptions in the tropics or large eruptions at high latitudes? This sentence needs to be written more carefully.

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Page 5, line 17: Did this overly dilute plume affect your results?

Page 5, general: You don't talk too much about the effects of the vertical distribution of the aerosols.

Page 8, line 7: Maybe I'm misinterpreting your colocation metric, but it doesn't look like the plume is "reasonably well simulated" by the model. Some clarity is needed here.

Figure 2 and surrounding analysis: Mills et al. (2016) show that WACCM+MAM3 simulates Pinatubo really well. This is using the same model (albeit with CARMA instead of MAM), but there are some discrepancies in Figure 2. Can you say more about why?

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