Below please find our specific responses to the reviewer CC1. The format is the reviewer comments in italics followed by our reply.

CC1:

1) It is "Raikoke", not "Reikoke" Yes, sorry.

2) L25: "dust": do you rather mean "meteoritic dust"?

No, we meant mineral dust which has been observed in the lower stratosphere by research aircraft.

3) L78-79: "Figure 1a shows...869 nm": what are your assumptions in terms of composition in these Mie calculations (I guess it is sulphates but in case please mention this explicitly"

We assumed spherical sulfate aerosol particles with usual refractive index. We will add that point to the text.

4) Linked to my previous question, one fundamental question that I have on this method: how do you cope in your method with aerosol mixing, i.e. aerosol layers with particles of different composition? In this case, I imagine that CR is no more insensitive to size. This is quite critical for first stages of some volcanic eruptions, like Raikoke (there was a significant fraction of ash in the early sulphate plume).

The short answer is that we don't assume aerosol mixing, the different sizes are accounted for In the size distribution which is assumed fixed (log-normal in the case of OMPS-LP). However, our error analysis (above) quantifies the uncertainty in the retrieved size as a function of the size distribution width.

5) For Hunga Tonga, there are size distribution measurements shown in Kloss et al. 2022 (https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2022GL099394), that are ideally perfect correlative data for your method.

Yes, thank you for the reference.

6) For the rapid formation of sulphate aerosol in Hunga Tonga plume (which is linked to their size evolution), you cite model studies of Zhu et al 2022 (L234) but this is also shown with observations in Sellitto et al. 2022

(https://www.nature.com/articles/s43247-022-00618-z), as well as hypothesis of why observed SO2 emissions where small (L228) and estimations of the radiative impacts of Hunga Tonga plume (L227), and should then be cited in your discussion.

We will include the Silletto et al. (2022) reference in the revised paper.