

Report #1 submitted on 16 Nov

The revised paper has been significantly improved compared to its first versions, and I am happy to recommend it for publication. It is a valuable study that conducts radiative transfer calculations based on observations and clears up some inconsistencies from the prior publications regarding the radiative forcing at the Reunion Island site. I have a few minor remarks that might help to improve the manuscript further.

General comment:

What the authors call Direct Radiative Effect (DRE) is Instantaneous Radiative Forcing (IRF). It should not be mixed with an Adjusted Radiative Forcing (ARF). For example, Zhu et al. (2022) presented ARF and IRF. IRF is in the supplement. Please have this in mind when making comparisons with other studies.

Reply: Thank you for the advice. We just realized this difference of nomenclature, thank you. It is true that our DRE is to be compared with Zhu et al. IRF. Some slight changes have been made in this sense in the manuscript. It is also worth mentioning that the “instantaneous” adjective could result ambiguous in some circumstances since it could also refer to the temporal resolution of the DRE estimation. In our work, daily DRE are presented.

Specific comments:

L54: Are these diameters or radii?

Reply: radius. It has been added.

L114: I am not sure if OMPS was introduced.

Reply: It is now done Line 114 and Line 108 where OMPS appears for the first time.

L260: If you said that the descent is 244 m per month, keeping the same units and saying it is 8 m per day is better.

Reply: Done here, in the abstract and conclusions.

L323: It is an overstatement, as positive forcing is far within error bars.

Reply: on Line 323, the statement made is about the H/C rate anomaly, not the forcings.

L340: I am sure Zhu et al. (2022) calculate the sulfur cycle where OH oxidizes SO₂.

Reply: This is true that Zhu et al. calculate the sulfur cycle. But the comparison here is made against Zhu et al. simulations called “H2Oonly – control” (supplementary Figure 10, bottom line, second column for the TOA Net Instantaneous). In this simulation of Zhu, no SO₂ is considered.

L356: It is not essential, but here, DRE is compared with ARF but should be with IRF. Their IRF is 0.19 W/m².

Reply: Changed.

L362: decreasing IN ABSOLUTE value ...

Reply: Done.

L426: It is overstatement. The aerosol lifetime is shorter because there are other removal processes.

Reply: The beginning of the sentence now reads “Assuming this rate constant in time and omitting other removal processes, the remaining life time...”