

Interactive comment on “Overview: The Cloud-Aerosol-Radiation Interaction and Forcing: Year-2017 (CLARIFY-2017) measurement campaign” by Jim M. Haywood et al.

Anonymous Referee #2

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Start of review

The paper provides a very comprehensive overview of the CLARIFY-2017 experiment that took place over the Southeastern Atlantic (SEA) Ocean during the biomass burning season over southern Africa. The paper covers all aspect related to such an intense detachment effort in a remote area, including pre-campaign preparation (incl. dry runs, satellite climatology and model strategy) and interactions with other detachments which took place at roughly the same period in the SEA basin, namely the LASIC, ORACLES and AEROCLO-sA campaigns. The paper also presents some scientific highligths to illustrate the body of new knowledge gained from the CLARIFY project.

C1

Overall, I find the paper to be very clear and well written, and only have minor comments or suggestions to make to the authors.

L49: "Aerosol-cloud interactions, also termed indirect effects, arise from aerosols acting as cloud condensation nuclei (CCN) in warm clouds": Aren't ice clouds concerned too? Should not this be mentionned as well here on the basis of the recent ICE-D detachment made from Cape Verde?

L156-157: "However, it is difficult to fully discern the level of interaction between clouds and aerosols because of the sensitivity of lidars in the free troposphere (Watson-Parris et al., 2018) and the attenuating effects of a thick layer of aerosols overlying clouds." This is agreed, but the work by Daeconu et al. (this special issue) has shown that this can be managed as long as one uses CALIOP observations at 1064 nm. I think it would be worth mentionning this study:

Satellite inference of water vapour and above-cloud aerosol combined effect on radiative budget and cloud-top processes in the southeastern Atlantic Ocean Lucia T. Daeconu, Nicolas Ferlay, Fabien Waquet, Fanny Peers, François Thieuleux, and Philippe Goloub Atmos. Chem. Phys., 19, 11613–11634, <https://doi.org/10.5194/acp-19-11613-2019>, 2019

368: SLR already defined.

Figure 7: could be improved by showing the type of flying as a function of the objectives...? And show the kind of vertical sampling made during the flights as well.

Figure 10: It would be nice to show winds associated with the composited geopotential patterns.

Figure 11: nice but why have you not composited the back trajectories on the same days as for the G1 and G2 ? why do this on the whole of August?

End of review

C2

C3