

Interactive comment on “Aerosol and cloud properties in the Namibian region during AEROCLO-sA field campaign: 3MI airborne simulator and sun-photometer measurements” by Aurélien Chauvigné et al.

Anonymous Referee #1

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"Aerosol and cloud properties in the Namibian region during AEROCLO-sA field campaign: 3MI airborne simulator and sun-photometer measurements." by Chauvigné et al. presents the OSIRIS products such as aerosol optical depth and single scattering albedo obtained during the AEROCLO-sA airborne experiment. The presentation takes the form of histograms of individual variables, comparisons to reference observations and scatter plots between pairs of variables.

The paper, as it is, provides not so much science as retrieval results. Deeper analyses and discussions would be suitable. For example, no explanation is given for the

variability in the above-cloud SSA (between 0.75 and 0.95) (Line 331). What kinds of measured radiance spectra yield the low and high SSA values? Discussion is insufficient as to why the average SSA values, given only for two of the five flights, are judged similar to each other despite the 0.02 difference. It is also unclear in what logic the supposed similarity suggests the competing effects counteracting the meteorological variation. Doesn't the similarity rather suggest uniform source or retrieval inflexibility?

A more careful analysis for the AOD comparison would be nice too. In Line 246 the stratosphere is included in the PLASMA2 AOD but excluded from the OSIRIS. Can the stratospheric AOD value be estimated, for example from the PLASMA2 observations at the highest altitudes? Subtracting it from the low-altitude PLASMA2 observations may result in even better agreement with OSIRIS for the three days other than September 5.

Discussion on the apparent AOD-H₂O relationship (Line 350) should address cloud contamination. Thin clouds can be mistaken as high AOD and are often coincident with high water vapor. How much of the data shown in Figure 10 were taken under clouds? How did you determine that?

As for the comparison of the calculated DRE values with other estimates, cloud fraction and intentional sampling bias should be mentioned in the place where the comparison is described (Section 4.6), without waiting until Lines 446 and 443. It is worth explaining and emphasizing why these two factors weaken the usefulness of the comparison.

Minor suggestions follow.

Line 3 Remove the period.

L. 16 Remove the first "of".

L. 22 Spell out AAC.

L. 25 Don't spell out AAC.

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L. 27 "show" should precede "a".

L. 44 Replace telluric with terrestrial.

L. 95 "coexist" should read "coexists".

L. 105 Sect. 4 should read Sect. 5.

L. 119 Put "m" after 15.

L. 120 Remove the vertical bar.

L. 133 "the" should precede "airborne".

L. 140 "wild" should read "wide".

L. 149 Did you mean to put "a" before "few"?

L. 184 Put "to" after "referred".

L. 190 "overcoast" should read "overcast".

L. 261 The backscattering of $1.10 \cdot 10^{-6}$ m-1sr-1 is not necessarily low. Shinozuka et al. (2020) used a threshold one fourth as large to identify smoke. How about noting the value under which 95% of the Sept 12 data reside, instead of 100%?

L. 346 Drop s from "coasts".

L. 355 End the sentence with a period after "area". Capitalize b in "biomass".

L. 406 Insert "horizontal" before "resolution".

L. 411 Put an s to "contribute".

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