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Atmospheric Measurement Techniques Discussions

Interactive comment on "Quantitative comparison of measured and simulated O_4 absorptions for one day with extremely low aerosol load over the tropical Atlantic" *by* Thomas Wagner et al.

Anonymous Referee #3

Received and published: 3 March 2021

The present manuscript addresses the issue of the difference between measured and simulated O4 dSCDS. Many studies over the last year used correction factors on the measured O4 dSCDs to achieve a better agreement without finding the physical explanation of these factors. Other studies support that the use of correction factor is not necessary. In previous studies, one possible explanation of this inconsistency was the uncertainties of aerosol information. It is very interesting that in this manuscript, this uncertainty is neglected because of the use of one day of measurements with very low AOD values.

I recommend the publication of the present manuscript. The content is clear, well

explained and the manuscript falls into the scope of AMT. Please consider some minor comments:

1. In Figure 1, I see that other days (or at least time windows during some days) have very small AOD values. Why these days are not included in your results? Would it be possible to include them and see if the results agree with the main findings of your study?

2. The uncertainties that are described in the text are very important for your findings. That would be very useful if you could create a table of uncertainties.

Specific comments:

1. P.1, Line 21 : "aside from" instead of "aside"

2. P.1, Line 22 : "e.g.," instead of "e.g."

3. P. 1, Line 32 : "In this study," instead of "In this study"

4. P. 1, Line 25 : Please add some studies that used a scaling factor

5. P. 4, Line 156 : Can you provide a possible explanation for this difference between ECMWF and in-situ measurements?

6. P. 5, Line 175 : "simulations," instead of "simulations"

7. P. 5, Line 208, 210, Figure 4 : Is there any explanation why the raw data vary more with altitude? Is it valid to use the data above 3 km?

8. Figure A8 : y axis varies from 0 km to 10 km and not from 0 km to 0 km. Please correct

9. P. 6, Line 221 : why the Angstrom coefficient is assumed equal to 2?

10. P. 7, Line 276 : "be between" instead of "bebetween"

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