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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Validation of UV-visible aerosol optical thickness retrieved fromspectroradiometer measurements" *by* C. Brogniez et al.

Anonymous Referee #2

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General comments:

The manuscript deals with the retrieval of aerosol optical depth, derived from spectral measurements in the UV-visible range. Although the used method is valid, the results are sufficient and the overall presentation is quite well structured, some parts of the paper should be clarified or extended. The overall impression is that some major revisions are needed before publication to ACP.

Specific Comments:

1. Quantitative results, instead of expressions like 'very large discrepancies' or 'very

satisfying agreement', should be added in the manuscript. These results should be clearly mentioned also in the abstract and conclusions paragraphs.

2. The authors could give more credit to related work in the introduction paragraph. Some references are included, but there is no discussion about the results presented at those studies. As a consequence, the direct comparison of results of this study and those from relevant publications cannot be easily made. It would be further recommended, that a short paragraph comparing the outcomes of this manuscript with those of previous studies could be added in the results paragraph.

3. The authors try to validate their results with measurements from AERONET. This method has been used also before (e.g. Kazadzis et al., acp, 2007 and references therein), so some relevant studies could be referenced and discussed in the introduction and results paragraphs.

4. page 3898, line20: the STREAMER code was used to calculate the radiances for the shadow ring correction. Some information (or a relevant reference) about the input parameters that were used in model calculations and the performance of the method could be provided.

5. Figure 2: The SHCIRIVM algorithm should be capable to correct any wavelength shift. Such a large variation in the AOT spectrum could be attributed also to the insufficient estimation of the FWHM of spectral response or to the low resolution of the extraterrestrial spectrum. The reported smoothing over 2,4 or 6 nm could be considered acceptable, but it is rather surprising that the retrieved aerosol optical depth is almost stable in the 400-440 nm spectral region.

6. page 3902, lines 7-16: some of the AERONET specifications, mentioned in the introduction paragraph (page 3897, lines 2-8) could be more easily fitted here.

7. The method of cloud screening, used to determine the cloud-free spectral measurements, should be mentioned or referenced, since the one global and the two diffuse

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spectra are measured within half of an hour.

8. As the authors mentioned, there are large discrepancies of aerosol Angstrom exponent coefficient between the spectroradiometer retrievals and the sun photometer data. If the aerosol optical depth values in the visible region do not show any spectral dependence (see also comment 5), it would be worthwhile to calculate the exponent coefficient only in the 340-400 nm spectral region. Although the two wavelengths are not exactly the same with those of Aeronet, the differences could be decreased.

9. Page 3904, line 27 up to page 3905, line 2: figures 9 and 10 could be omitted; otherwise the discussion should be extended.

Technical corrections: Page 3896, line 20: replace 'Forsters' with 'Forster.

There are some acronyms that should be explained (NIST, NPL etc).

Page 3898, line 19: replace 'so' with 'and'.

Page 3899, line 17: please clarify the 'other absorbing species'.

Page 3899, line 23: please provide 'the standard midlatitude atmosphere values' for the surface pressure.

Page 3902, lines 18-23: these sentences could be conjoined in one paragraph.

Page 3903, line 13: the phrase 'one can see that' could be deleted; the same for other relevant phrases throughout the manuscript (one can notice etc.)

Page 3905, line 7: replace 440 with 340.

Caption of table 1: replace 'several' with 'four'.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 3895, 2008.