

Interactive comment on “Determination and analysis of spectral aerosol optical properties by a multi-instrumental approach” by S. Segura et al.

Anonymous Referee #2

Received and published: 4 April 2014

This paper presents angstrom exponents, absorption coefficients and single scatter albedo for measurements over one summer month in southern Spain. The instruments used are an aethalometer, nephelometer, and multi-angle absorption photometer. Steps were taken to compensate for filter loading and the results obtained were consistent with other similar measurements. The results of one month of measurements are presented and analyzed. Differences between week day and weekend traffic were noted. Two episodes with Angstrom coefficients approaching 2.0 warranted further detailed analysis concerning the aerosol source.

The paper is well written, with the exceptions noted below, and the subject a useful contribution. There are several inconsistencies between the discussion and the tables/figures which should be corrected, but there are no major problems. The paper

C391

should be published after the authors address the following, listed in order in the paper, using page and line number. In most cases for small corrections, I only supply the corrected phrase.

1872.1 – change where to were

Fig. 2 caption. The sentence beginning, “We see ...” should not be in the figure caption.

Fig. 2 general. Make it a 2 panel figure combining panels a&b and c&d. This will make the panels larger, make the comparisons easier, and allow the variations in c&d to be compared directly. With the different scales it appears that there is more variation in d than in c. Isn't the large change in b_{abs} above a loading of 4 a bit troubling?

1881.24. “The result ... is that b_{atn} is ...”

1881.27. “... these compensation factors ...”

Table 1. The caption refers to row labels (100α , M) which do not appear in the table.

1882.1-5. Even though the slope is zero isn't the large variation 0.5-1 about the intercept troubling, or is this normal?

1887.14. Is it 3.42 and 4.59, or 3.39 and 4.35 (as in Table 1 and in the conclusions) at 370 and 950 nm?

1887.17. ... than at near ...

1887.28. ... around 72% ...

1888.20-22. How does Fig. 4 differ from the Table 3 rows on b_{abs} ? The single scatter albedo measurements would also be more usefully displayed in a box-whisker plot. Is Table 3 necessary?

1889.4. Here again the text and tables do not agree. Why? The minimum b_{abs} in Table 1 is 5 at 950 nm. The text claims 6.

C392

1889.10-14 and Table 3. One significant figure is too few for single scatter albedo mean, and median. These should be two, as quoted in the text. With the numbers given in the table why are they repeated in the text. Use the text for making notable comments, not re-reporting of the values.

Fig. 5. I don't see any red lines indicating hourly averages at 950 nm. In some figures there are gray lines. The figure panels are not labeled with a, b, c, ...

1889.22. Delete presents.

Fig. 7. Why are only three panels labeled with letters? The figure captions by letter do not fully explain the panels.

1893.1-5. The following text is not consistent with the figure, which shows trajectories at 500, 1500, and 3000 m, nor if the 300 m in the text is changed to 3000 m, does it make sense.

"Another event was detected on 20 (day 202) and 21 (day 203) July. HYSPLIT back trajectories arriving on the 20 July at 1500 and 300ma.g.l. reached Granada proceeding from the Atlantic Ocean, entering the Iberian Peninsula from the Northwest, while at 500ma.g.l. they came again from the Mediterranean Sea between Spain and North 5 Africa (Fig. 6b)."

Note there is no mention of the 3000 m trajectory coming straight off the Atlantic, while the 1500 and 500 m trajectories are virtually identical.

1893.9-10. "This includes North African air masses, loaded with mineral dust, and air masses from regions affected by fires."

How do the authors arrive at this conclusion. None of the trajectories are coming from North Africa. In fact I don't see how the trajectory modeling supports the evidence of dust in the NAAPS modeling and in the aerosol measurements.

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 1871, 2014.

C393