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Atmospheric Measurement Techniques Discussions

Interactive comment on "Aerosol retrieval from multiangle multispectral photopolarimetric measurements: importance of spectral range and angular resolution" *by* L. Wu et al.

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Dear Editor / Authors,

I offer some general comments in response to this submission. The manuscript is generally well written and worth consideration, but the following point should be addressed before publication.

Specific Comments

- A point that remain very unclear to me is how many RSP measurements were processed in total. The paper would greatly benefit from a comprehensive table listing

them all (including the AERONET stations coincident measurements).

- substitute "fine mode" for "small mode".

- Remove symbols from figures 2, 4 and 10 (keep only colored lines), they are not needed and create confusion.

- Can Figures 7, 8 and 9 be condensed in a single, 6-panel figure? Also, adjust the axis ranges so that data don't get all crammed in a corner.

Figure 3. Caption: correct two occurrences of misspelled "panel" and substitute "before" and "after" with "accounting for" and "not accounting for".

Figure 4: Why does the variance of the coarse mode benefit from the smallest spectral range?

Figure 6: It would be nice to add in the caption some more information on the scenario. Where is (-91.7, 32.3) located? What is the closest AERONET station? What aerosol load/type was being measured? You can also comment on the fact that the fit looks satisfactory although the Solar Zenith angle is close to the thresholds commonly assumed to avoid problems with the plane-parallel approximation.

Page 2793

Change title to "Aerosol retrievals from multiangle, multispectral photopolarimetric measurements: importance of spectral range and angular resolution".

Page 2796

Line 1-2: In what sense these studies are based on linear error propagation, if they contain inversion retrievals? How much smaller were the number of aerosol scenario?

Page 2805

Line 4: I cannot see this improvement. Please clarify.

Line 27: Why are case with low optical depth excluded? It would be interesting to see

the performance at those low values as well.

Page 2806

Line 4: it is worthwhile explaining why it s difficult.

Line 15: In Sec. 2 you state that “In order to reduce this effect we average RSP measurements over a distance of 5km so that mis-registrations between viewing angles become small compared to the effective pixel size”. It would be good to include a figure that shows how this averaging still does not remove the oscillations due to surface inhomogeneities.

Technical corrections

Page 2794

Line 2: here multi-angle and photo-polarimetric are spelled differently.

Line 7: over “the” continental US.

Line 20: correct “multi-angle” or be consistent in the title.

Page 2795

Line 8: correct “multi-angle” or be consistent in the title.

Page 2796

Line 13: "The RSP data used in this paper".

Line 19: over “the” continental US.

Page 2797

Line 15: remove “in the atmosphere”.

Page 2798

Line 10: Redundant sentence: “Here we describe particles as a mixture of spheres

and spheroids with the aspect ratio distribution proposed by Dubovik et al. (2006).”

Page 2799

Line 4: if the vectors are indicated by bold font, what’s the use of the parentheses?

Line 12: Why not particles / mˆ3?

Line 24: correct to “This may be different if “Brown Carbon” type aerosols are included in the analysis”.

Page 2801

Line 4: correct to “We also retrieve the height of the aerosol layer Gaussian height distribution”.

Line 20-ff: I’d see these details more readable in a table.

Page 2802

Line 9-ff: Same as above, it would be nice to condense all this information in a table (especially the parameters describing the surface).

Page 2804

Line 7: how much is chi adjusted?

Line 13: It’s worth mentioning that these thresholds need be met to yield climatological parameters of appropriate accuracy, not to make them seems a requirement applicable to APS only.

Line 16: Correct to “change from 2 to 3” and “do not improve further”.

Lines 20-24: I don’t think you need to repeat values that are well visible in the figures.

Page 2805

Line 10-ff: again, perhaps the paragraph reporting the numerical values is not needed

Page 2806

Line 17: Correct to “we include only cases where the sampled scattering range includes the 85-155 degrees interval”.

Line 26: correct to “spectrally dependent”.

Line 27: correct to “it can be applied to all RSP channels”.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 2793, 2015.