

Interactive comment on “Results from the 4th WMO Filter Radiometer Comparison for aerosol optical depth measurements” by Stelios Kazadzis et al.

Anonymous Referee #2

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This manuscript by Kazadzis et al., "Results from the 4th WMO Filter Radiometer Comparison for aerosol optical depth measurements", presents the results of the 4th Filter Radiometer Comparison of AOD measurements held in Davos, Switzerland, where thirty filter radiometers and spectroradiometers from 12 countries participated.

The scope of the paper is both concise and specific. Moreover, the manuscript is clear and well written, so I have only some minor comments to be considered in the revised version before the publication.

General comment:

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Regarding the Figure 2, I was wondering that it would be perhaps interesting to focus on and discuss the diurnal patterns a bit more. For instance, POM_JP shows a diurnal pattern that is likely solely related to the calibration (as discussed in Cachorro et al. 2004). Or what do you think? Of course this would be more obvious to see and confirm, if the time in x-axis was a local solar time (instead of UTC time) and if similar plot would show the average hourly pattern (mean or median in each hour of local solar time). If this particular effect (of calibration) could be isolated with the help of diurnal plot, then it would give, at least in a rough sense, also a better quantitative idea about the role of the other sources causing the differences between different measurements.

By the way, in this figure the labels are not visible in the paper version, only if heavily zoomed in in the pdf-version (but this particular case seemed to be POM_JP). And the very small font size seemed to be a problem with the other figures as well.

Specific comments:

Line 48: I did not find these references as best suited here, for satellite-based AOD. Would some latest references for MODIS, MISR AOD algorithms and product perhaps be better fitted here?

Line 65: This sentence, regarding the references, was not immediately clear. What Neckel and Labs refers to, if given separately at the end of the sentence and other references earlier referring to the uncertainty estimate of 1%.

Line 429: "18% in common ...", should this be 0.8%?

Figure 9: Include the label for x-axis in this plot.

Line 531 (also in the line 38). I was thinking whether the word "sensitivity" is the best one here to give surely the right idea, idea being that the uncertainty in AE increases with decreasing AOD. Could one say that the sensitivity of AE to AOD then decreases as well? If so, is there a danger that one could misunderstand a statement like "sensi-

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tivity of this parameter at low AOD conditions".

Cachorro, V. E., P. M. Romero, C. Toledano, E. Cuevas, and A. M. de Frutos (2004), The fictitious diurnal cycle of aerosol optical depth: A new approach for "in situ" calibration and correction of AOD data series, *Geophys. Res. Lett.*, 31, L12106, doi:10.1029/2004GL019651.

Interactive comment on *Atmos. Chem. Phys. Discuss.*, <https://doi.org/10.5194/acp-2017-1105>, 2017.

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