

Interactive comment on “Aerosol Optical Depth comparison between GAW-PFR and AERONET-Cimel radiometers from long term (2005–2015) 1-minute synchronous measurements” by Emilio Cuevas et al.

Anonymous Referee #2

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The paper “Aerosol optical Depth comparison between GAW-PFR and AERONET-Cimel radiometers from long term (2005-2015) 1-minute synchronous measurements” is very interesting for the scientific community working on photometry. It is really well written, very accurate in the analysis of all the aspects affecting the comparison and it is pleasing to read. I recommend the publication on this journal also because homogenization of international networks of photometers is an important issue at this stage of research.

I have few specific comments for the authors: 1. Introduction, lines 12-15. It

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is not true that only two global ground-based radiometer networks exist, that is AERONET and GAW. SKYNET (<https://www.skynet-isdc.org/>) and its regional sub-network ESR (www.eroroskyrad.net) provide centralized AOD and other optical and physical aerosol parameters, on a daily bases and downloadable from the website. SKYNET is also attending several intercomparison campaigns against PFR as example www.eroroskyrad.net/quatram.html, and the Fourth WMO Filter Radiometer Comparison for aerosol optical depth measurements. So I'd suggest the authors to mention their existence.

3.GAW-PFR and AERONET-Cimel radiometers, line 21: specify if these Cimel models have one sensor for both direct and diffuse solar radiation (new models) or two different sensors (old version). Lines 21-24, the deterioration of the filter is however “not minimized” by the absence of a system for keeping the temperature constant inside the optics. Page 6 line 1-3, it is better stating also here that the final measurement is an average of the 10-s measurements, even if declared later. Line 12, is not the triad of PFR calibrated by lamps, but using Langley plot?

4. Data and methodology used in this study Line 24, format problem Line 33, state here that in the section 5.4 AE will be compared

5.1 AERONET-Cimel AOD traceability Line 5, I don't know if it is easy to represent, but in Figure1 it would be interesting to highlight the changes of equipment during the time.

5.2.1 Calibration related errors line 16: are all the involved Cimel “Masters”?; “in-situ absolute calibration”: with absolute do you mean by lamp? Lines 20-21: It is not clear why you transfer calibration among Cimels if they are all masters, and therefore calibrated separately. Figure 2: why there is a hole of data for optical mass at about 4.2?

5.2.3 Did you consider a possible influence of WV absorption at 500 nm? Small differences came out during the Fourth WMO Filter Radiometer Comparison. Pag 19 line 11 Cimel doesn't measure pressure, so better saying “ from the different way the two

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instruments assume the atmospheric pressure”.

Pag 24 line 9 : Figure 6 is not about the combined effect of the 3 components, but about NO₂.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2018-438, 2018.