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Atmospheric Chemistry and Physics Discussions

Interactive comment on "AERONET and ESR sun direct products comparison performed on Cimel CE318 and Prede POM01 solar radiometers" *by* V. Estellés et al.

B. Holben

brent.n.holben@nasa.gov

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We at AERONET are very gratified to see the comparison between our current Version 2 AOD results and those with the ESR processing system. However there are several misstatements and/or misrepresentations that should be pointed out and corrected for the record.

On page 4343 the authors correctly point out the need for climate data records be based on standardization. The following paragraph cites AERONET as an example of standardization but emphasizes the algorithm is not publically available implying that the global CDR record is less complete with the closed AERONET system. QA and

CDR's imply traceability. In an open source system in which the algorithm changes the final result i.e. CDR, QA'd AOD etc., traceability quickly disappears and one's confidence in the product can and is diminished. This becomes very difficult to reconcile for publications when results must be reproducible. In an open source algorithm, changeable databases are the norm and confound the scientific process. I thus recommend that the paragraph referencing CDR's be removed and that the paper acknowledges that ESR is a research and development network different from traceable data produced by AERONET.

Having said that we applaud the use of open source code to develop new and improved algorithms as a research tool. I wish to note that the AERONET algorithms are closed is a misrepresentation. All of our algorithms are either published and/or available on the AERONET Website http://aeronet.gsfc.nasa.gov/new_web/publications.html. As has been stated since the Holben (1998) paper that the AERONET team uses verifiable and published and community accepted algorithms in the AERONET processing code, thus AERONET has worked with all willing investigators to develop the best verifiable up to date processing code possible for the parameters of operating a traceable network. Due to the tremendous complexity of interfacing an algorithm with the various inputs from NCEP, satellite databases and incoming data flows the processing development remains within and under the control of the AERONET system. An example is the frequently used SDA processing developed by Prof. Norm O'Neill at Sherbrook University. Currently our version 3 processing that is under development is engaging members of the satellite community to provide new correction climatologies, the lidar community for cloud screening and members or the Goddard AERONET and PHOTONS staff for polarization algorithms and calibration procedures.

I wish to correct the record, there are over 450 instruments registered in AERONET distributed over all continents. The paper implies that it is primarily a North American and European network. Indeed most of the instruments are not in North America and Europe.

I note that this paper only deals with AOD that is based on a direct measurement and thus is not a retrieval as frequently misstated throughout the document. The paper notes that AERONET adopts the original Dubovik & King (2000) code. This is the inversion code and has nothing to do with the AOD computations. Lastly the Dubovik code, as a standalone, is available from Dubovik at LOA.

A note on the Figure 3 comparison: The authors show in Figure 3 distinct seasonal variation in AOD that they attribute to '. . .inaccuracies of the solar position and optical mass routines implemented in the sunrad mode 1. This effect is strongly apparent in the temporal evolution of the differences, shown in Fig. 3. These rms deviations are still below the AERONET estimated uncertainty for a field instrument (0.01–0.02 uncertainty depending on channel, higher at shorter wavelengths).' We conclude the seasonal cycles in ESR's AOD show a poor computation accuracy and should be corrected as correct algorithms are widely available. The paper states, "These algorithms are very similar to those implemented in version 2 of the AERONET sun direct algorithm (AERONET Website, 2011). Therefore, our results should be the same as the Cimel AERONET measurements." Figure 3 demonstrates that this is not true.

The paper states that the sunrad and skyrad modules were made available in 2011 from the ESR web site, but they are not (see http://www.euroskyrad.net/download.html) as of 23/03/12.

The paper states, "Ozone columnar burden has been obtained from the OMI sensor and correspondingly interpolated for any instantaneous measurement (OMI website, 2011). NO2 and water vapor were not available at this site, so they have been selected from published climatological values and standard atmospheres (Gueymard, 2001)." Here, there is no effort to obtain column values of NO2 in the same way as Ozone? This clearly illustrates the problem of lack of standardization with an open source code. The local user will be forced to use their version of external data to make the corrections. The result will be variable results across the network calling into question intercomparability between sites. The use of NO2 products is described on the AERONET

web site.

I hope the authors will modify the manuscript based on these comments to accurately put into perspective the ESR source code for the scientific community.

Brent Holben Philippe Goloub Tom Eck Alexander Smirnov Joel Schafer David Giles

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