**Atmospheric
Chemistry
and Physics
Discussions**

Interactive comment on "Validation of an hourly resolved global aerosol model in answer to solar electricity generation information needs" *by* M. Schroedter-Homscheidt and A. Oumbe

Anonymous Referee #1

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This paper compares aerosol optical depth values between AERONET and the MATCH/DLR model on daily and hourly time series. The topic is relevant to the solar industry, as is well discussed and motivated in the text, and also of interest to the aerosol community. I should be published in ACP.

I made a number of remarks regarding the presentation during the initial stage of the review, and am happy to see that most of my concerns have been adressed in the present manuscript.

As it stands, I have only one specific comments to the analysis itself, which is mostly straightforward and interesting.

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The authors wish to validate the performance of a particular model against a data set. This is fine. They explicitly state that the aim of the paper is not to improve modeling, which is also fair although some steps towards improvements (i.e. sensitivity tests to some of the datasets used in the model, could data, optical parameters etc.?) would have strengthened the paper. But they then introduce a correction for "suspicious" dust events, apply it to the model data, and conclude that they see a slight increase in preformance. This correction - which in a sense is indeed an attempt at a model improvement - needs furter discussion if it is to be kept in the paper.

I agree from the plots and discusson shown that these events need to be treated in the analysis, but I am missing a deeper discussion of what it is the authors are removing. The authors state on p31927, l8 that the physical reasoning is beyond the scope of the paper, but as one of the main conclusions rests on this post processing I think this needs further discussion. As I understand it, the suspicious dust events occur in the model and coincide with times where the AERONET stations mostly have no data. (p 31926, l6-7). Wouldn't this mean that there is also no data for a comparison? If so, how does setting the model AOD down to a background level (which is what the correction does) end up improving the RMSEs and biases? It's likely that this has an obvious answer, but I would wish for further discussion of these points.

So to summarize this comment: I would either remove the dust correction, as I believe the paper is actually interesting without it, or go into further detail about what it removes and what it does to the dataset. I believe anyone aiming to use your results will be concerned about this factor as the manuscript presently stands.

Technical comment:

- Figure 1 is very hard to read, as it has both small numbers for the stations and some weak colors (esp. pink and light blue). I would recommend changing to clearer colors throughut the figures

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 31917, 2012.