Atmos. Meas. Tech. Discuss., 5, C2259–C2262, 2012
www.atmos-meas-tech-discuss.net/5/C2259/2012/

Atmospheric Measurement Techniques Discussions

Interactive comment on "Development of a new data-processing method for SKYNET sky radiometer observations" *by* M. Hashimoto et al.

M. Hashimoto et al.

m_hashi@aori.u-tokyo.ac.jp

Received and published: 18 September 2012

Author's response: Hashimoto et al. "Development of a new data-processing method for SKYNET sky radiometer observations"

Dear Editor,

We thank the editor for useful suggestions. Below we answer to the editor's comments.

Sincerely yours, Makiko Hashimoto

——————————— Author's response ———————————

Reviewer comment: This important paper is often somewhat difficult to read and to

comprehend, but the sensitivity study and its conclusions are very important. One of the strengths of AERONET is the ability to scan the sky in the almucantar and this information (symmetry or lack thereof) is used to help in the cloud screening (cirrus contamination, for example). As I understand it, this is not an operating option in SKYNET and much discussion of cloud screening is made in the manuscript. This could be made much clearer if this and other operational concepts are presented early in the paper.

Author's response: We thank the reviewer for this comment. We agree that we did not mention the operational differences between AERONET and SKYNET, in spite of we compare some parameters obtained by these two networks. There are several differences in operational routines between AERONET and SKYNET including two side scanning by AERONET and one side scanning by SKYNET. Although we do not find a systematic difference due to the scanning method, we have added a description of this point in the revised manuscript.

Reviewer comment: Line 195 – mention is made of investigating the error in the single scattering albedo (SSA) for various levels of aerosol optical thickness between 0.05 and 1.0, but no results are presented here. Instead the authors state that they analyzed the data and compared the retrieved SSA with and without the assumed errors. The subsequent Figure 2 doesn't cover a variety of aerosol optical thicknesses, but only one (presumably), which is not stated. This sensitivity is raised in line 224 where it is stated that an aerosol optical thickness (at some unspecified wavelength, presumably 0.5 μm) needs to be greater than 0.3 for a viable retrieval of SSA to be obtained. This is similar to AERONET and the oft-cited AERONET sensitivity paper (Dubovik et al. 2000) is referred to here, but there seems to be a disconnect between the earlier statement and this one. Please clarify.

Author's response: We investigated error causes in the single scattering albedo (SSA) in section 2.2 by two sensitivity tests: One is the investigation of the sensitivity of SSA retrieved by SKYRAD.pack to the error in other parameters that we use in the analysis;

the other is the investigation of the SSA error caused by the AOT value. However, we described these settings of experiments and results together, so this is the cause of confusion. To remove this confusion, we have revised the manuscript by separating descriptions of the two sensitivity tests and by adding the result for the latter test. For the latter test, it is reported that the error in the retrieved SSA decreases with increasing aerosol optical thickness for AERONET (Dubovik et al., 2000). We found a similar tendency for SKYNET sky radiometer data analysis as studied in this paper. We have added this point in the revised manuscript.

Reviewer comment: Figure 11 and line 403 – The fact that versions 4 and 5 of SKYNET consistently overestimated SSA when compared to AERONET is not adequately described. Is there an explanation for this?

Author's response: We thank the reviewer for this comment. We do not have a clear explanation for the polluted dust case of 11 November 2008 why SSAs are so different between AERONET and SKYNET even though the size distribution functions are similar to each other. So we investigated the lidar signal and skyradiometer data on this date in detail and found there were several types of aerosols over the Pune site as also shown in figure 10, such as polluted dust, polluted continental, smoke and clean continental. We also found these aerosols formed two or more aerosol layers. In this situation, we want to save this figure for future work to give a full analysis to identify the reason for the difference in such complex conditions, and have withdrawn figure 11 from the previous manuscript.

Reviewer comment: Line 536 – DARF is used and not defined. Please define this acronym.

Author's response: We already define the direct aerosol radiative forcing (DARF) at Lin 56; however, this acronym was not appeared until the section 4. We have redefined DARF in section 4.

Reviewer comment: Figure 18 – the color bars for the various tests for Autumn are not

clear (they are gray bars for the Pune and Beijing Autumn cases. Please correct.

Author's response: We have modified the figure 18.

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 4361, 2012.