

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

M. King (Editor)

michael.king@lasp.colorado.edu

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Review of “Development of a new data-processing method for SKYNET sky radiometer observations” by M. Hashimoto, T. Nakajima, O. Dubovik, M. Campanelli, H. Che, P. Khatri, T. Takamura, and G. Pandithurai Recommendation: This paper presents an analysis of the retrieval of aerosol size distribution and spectral single scattering albedo from an analysis of SKYNET sky radiometer observations, and assesses potential error sources that can contribute to an unreliable inversion procedure. It contrasts SKYNET findings with corresponding AERONET retrievals at two different high aerosol optical thickness sites, one in China and one in India. I recommend that this paper be accepted for publication with only minor editorial changes, especially with regard to

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figure quality suitable for publication. General Comments: 1. 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. Major Comments: 1. 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 $0.5 \mu\text{m}$) 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. Minor Comments: 1. 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? 2. Line 536 – DARF is used and not defined. Please define this acronym. 3. 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.

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