

Interactive comment on “Relative sky radiance from multi-exposure all-sky camera images” by Juan C. Antuña-Sánchez et al.

Anonymous Referee #2

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General comments:

The manuscript describes the characterization of an all-sky camera to extract relative sky radiances which are then compared to measured (AERONET) and modelled radiances.

Although no real new technique is revealed in the manuscript, the topic is relevant for atmospheric science and fits the scope of the journal. I would suggest a number of improvements, which add up to a major revision, to raise the overall quality and enhance the readability.

Specific comments:

L11pp. Please consider to improve the description of the relative / normalized radiance

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- see also the respective comment below.

L14. “in line” is a little loose phrasing for a scientific abstract.

L30pp. Please rewrite the first two paragraphs in a more precise way and better English language. For example, . . . responsible for the colour of the blue sky under clear conditions, and also by aerosols and surface albedo (rather than clouds, in clear conditions, I guess).

L53. “to derive sky radiance measurements...” It would be good for the introduction to state what is new/improved in the current work in relation to that past work.

L92. Are the sky radiance available at the AERONET website? If yes, where exactly?

L105. How many pixels are the threshold here?

L137pp. If white balance is about the relative scaling of the channels, how does it affect the individual relative radiances, which is the subject here? If the answer is “it does not”, please justify the inclusion of this section/topic.

L152pp. Please clarify this section. In general, the measured signal is a (non-) linear function of the number of absorbed photons plus a dark signal offset plus a noise, right? So dark signal (offset) and noise should be distinguished.

L175pp. Is there any explanation for the effect of the decrease again for temperatures above 50°?

L179pp. The benefits of Figure 4 and 5 (left) are questionable. I am afraid, I can only see black squares.

L202pp. Is there any less confusing way of presenting these numbers for the various cases?

L216pp. I find this explanation and the corresponding figure 6 quite confusing to read. Please try to improve here. Also avoid the “jet” or rainbow type colormap, as it is known

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to e.g. not be perceptually uniform. Maybe use the colormap of Fig. 8 throughout.

L301pp. Maybe clarify the nomenclature of “relative” radiance (relative to what?). Would it be more accurate to call it “corrected signal”? Later, the radiances are normalized relative to the sum of radiances.

L329. The concept of “dispersion” is usually applied differently.

L334pp. Is the word “linearity” used in two different ways in the same sentence?

L369pp. This whole paragraph is not really relevant for the paper (validation of the model?), nor is the conclusion surprising ($r=1$ for the comparison).

L383. “when the radiances are also normalized.” It seemed that the radiances should always be normalized for all comparisons.

L388. Would the wavelength difference also affect the standard deviation?

L423pp. Please rewrite this sentence in a more comprehensible way.

L575. Fig. 2. The letter annotation in the panels is missing.

L645. Fig. 9. There are very noticeable concentric rings in the images (same in Fig. 2), the jumps are even visible in the lower radiance plot (around $\pm 40^\circ$ scattering angle). This looks like a major issue for the topic at hand and should be discussed accordingly. While all-sky images typically show some kind of internal reflections and artifacts, these look quite a bit worse than in many examples I have seen from other cameras.

Technical corrections:

I acknowledge that the authors are not native English speakers, but please make an effort to improve the language in general, in terms of grammar (even spelling) and clarity. Some examples below:

L12 maps.

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L14. Except for.

L42. “Earth’s” or “the earth”, “the atmosphere”.

L86. “measure” sky radiances.

L136. “a wider”.

L138. “affects the”.

L140. “multiplication of the recorded”

L306. “radius of 3”

L286. “as can be seen in Fig. 2.”

Fig.12 x-labels: scattering angle. (same in Fig. 14)

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