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Atmospheric Measurement Techniques Discussions

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

Anonymous Referee #1

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This manuscript presents a generally well-written study on the relative radiance calibration of a sky imager using HDR images. The study presents a comprehensive method in order to take into account all possible sources of uncertainty in obtaining the HDR image and, finally, the relative sky radiance. I recommend this study for publication in AMT after some minor revisions.

On section 2, it is not specified the origin of the spectral response of the camera filters shown in Fig. 1. Is it from the data sheet from the CCD manufacturer? Are they calculated somehow? Please specify. The exact setup of the RGB triband filter is not clear. How are these filters coupled to the camera body or CMOS sensor? In addition, the same as before, where does the spectral response of the filters come from?

On section 3.2, what I'm understanding here is that the camera provides the images

with a white balance gains of 1.1 and 2.1 for the G and B channels respectively. The white balance is reversed by dividing the pixel values by these gains (as in Eq. 1) and the everything is calculated with the image without the white balance, correct? If that is the case, the effect of having saturated pixels due to the white balance still exist. Is it possible to manually set the white balance off (or white balance gains to 1) in the camera?

On section 3.3 (paragraph starting on line 173), the M_DFS and SIGMA_DFS are average and standard deviation of the sum of the three channels? Or is it one channel (which one?)

On the same section, finally, a temperature correction of the dark signal is not applied, right?

On section 3.4, why the cloudy day (18th August) is used instead of a clear day (the 17th) to show the signal value at one exposure time vs other exposure times? Why adding an Fig. A1 when that could the Fig. 6? In addition, on Fig. A1, the description says 18th august and should be 17th.

On page 8, line 233, after readout noise it should say "(N_r)" just for clarification.

On section 4.1 it is introduced that the time window for comparison is 10 minutes. Having almost 2 years of data, it might be possible to narrow this window. This could probably have an impact on the deviation of radiance values at small scattering angles ($<10^{\circ}$) besides other possible effects. As shown on Fig. 9, the slope of the radiance for small scattering angles is very steep, and a difference in sun position between image and photometer might have an impact. At least it could be quantified.

As a final comment, it if very surprising that the effect of the reflection of the lens on the dome is not higher. It is clearly visible on the images and, even though the almucantar and hybrid configurations explore very specific angles, I would expect a higher impact, especially for the hybrid configuration where the angles measure pass transversally the

reflection (as shown on Fig. 9).

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