

Interactive comment on “Calibration of an all-sky camera for obtaining sky radiance at three wavelengths” by R. Román et al.

Anonymous Referee #1

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General comment:

Román et al. describe a radiance calibration technique for an all-sky camera, where modeled radiances are used as ‘calibration standard’. The method has the advantage that it only requires a (freely available) radiative transfer code and a nearby AERONET station for aerosol model input information and no need for any radiometric laboratory infrastructure. Undoubtedly, the topic is of interest and scientific relevance for publication in AMT. The ideas are well presented and the manuscript is, in general, well written.

However, a significant shortcoming of the method is its rather large uncertainty of up to 15%, as compared to measured AERONET radiances. This severely limits its usefulness in real-world applications. I think, the large uncertainty is intrinsic to the

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method as a consequence of the uncertainty of AERONET inversion products, SSA and phase function. This is true especially for low aerosol optical depths (Dubovik et al., J.Geophys.Res. 105, 9791, 2000).

Recently, Pust et al. (Optics Express 19, 18602, 2011) have compared radiances from a laboratory-calibrated all-sky camera with modeled radiances (based also on AERONET input) and found similar differences. My claim is, that even with a perfectly calibrated radiometer, differences of the order of 10-15% to modeled radiances would not be too surprising because of uncertainties in retrieved aerosol characteristics. So this method is not ideally suited for calibration purposes.

But why don't the authors directly use the calibrated AERONET radiances in the principal plane and almucantar as 'calibration standard'? In fact, I believe, the exact reverse of the process used in the paper would be the natural direction and make much more sense, i.e. to use the AERONET radiometer as the reference and then compare the calibrated measured all-sky radiances to modeled radiances. The discrepancy will likely remain just as high, but the calibration matrix will be more reliable.

So I would strongly encourage the authors to revise the paper accordingly because otherwise the applicability of this method suffers unnecessarily.

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 1873, 2012.

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