

Interactive comment on “Revising short and longwave radiation archives in view of possible revisions of the WSG and WISG reference scales: Methods and implications” by Stephan Nyeki et al.

Anonymous Referee #2

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General comments

This manuscript is a great contribution to highlight challenges in and the complexity of high quality radiation measurements. It outlines important issues based on solid data and gives several recommendations on necessary actions derived from their conclusions. However, the question remains how realistic these suggestions or solutions are in the “real” world. Lacking the raw data needed for a recalculation of the radiation values most stations will have to leave their historic data as is. At the present, the added benefit and feasibility of a recalculation of archive data remains questionable. That being said, I nevertheless think it is essential to keep the discussion of these issues open and ongoing. And it is undisputed, that for future studies, the storage of the sensor raw

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data is highly desirable.

Specific comments

- One recommendation I would make is to concentrate on the long-wave fluxes. Introducing also the short-wave flux considerations does not add to the readability of the article. However, if the authors deem it necessary to leave it like that, that's ok with me as well.
- There is a more recent reference for BSRN which should also be cited in chapter 2.3: König-Langlo, G., Sieger, R., Schmithüsen, H., Bücken, A., Richter, F. and Dutton E.G. 2013: The Baseline Surface Radiation Network and its World Radiation Monitoring Centre at the Alfred Wegener Institute. www.wmo.int/pages/prog/gcos/Publications/gcos-174.pdf.
- The amount of abbreviations used is immense, although necessary. To improve intelligibility of the text I suggest to add a list of abbreviations at the end (txt or table form)
- You make it seem, as if the error of 3.5 – 5.4 W/m² was a general one. However, it only applies to clear-sky night-time measurements, right? You should stress more that these errors are much lower during all-sky 24h measurements (see Table 4), and are in this case within the range of the measurement uncertainty. Recommendation 6 seems therefore currently unnecessary. If raw data will be made available in the future, all studies requesting a IWV correction should be able to apply it to the archived data if necessary.
- Some stations might be especially prone to IWV dependence (dry climate/polar?), other stations in humid climates may not. I am missing a statement on this.
- As you stress the importance of the raw data, and the difficulty of obtaining it I recommend considering the publication of the data files used in this study in a public archive.

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Then, these files could also be cited correctly.

- In Figure 3 it becomes clear that the changes in sensitivity (C) between past calibrations/ deployment periods are much larger than the effect of IWV seems to be (compare with Fig. 1). Shouldn't this rather also be a focus of improvement efforts?

Technical corrections

- Page 1, line 23: According to Google Earth the location of the PMOD in Davos is rather at 46.813°N, 9.844°E, please check. If you give a location it should be as exact as possible in my opinion.

- Page 4, line 33 at the very end: the PMOD CG4-030669 pyrgeometer is only one instrument, right? Then it should read “pyrgeometer” and not “pyrgeometers”.

- Page 5, line 7: The sentence starting with “Regardless..” is a little confusing. What do you mean by “here” – also the “later on” is confusing, I'd suggest to rephrase this sentence and just mention the sections where these issues are discussed.

- Page 6, line 11: I do not find a Gröbner and Wacker, 2011 reference in the reference list, so either this reference is missing, or there is a typo in the publication year

- Figures 1 and 2: grey shades are rather hard to differentiate, in Fig 1 I cannot discern three shades of grey, in Fig. 2 the two shades are too similar to each other.

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