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Atmospheric Measurement Techniques Discussions

Interactive comment on "Retrieval of health-related UV doses from PAR measurements" *by* Marcelo de Paula Corrêa et al.

Anonymous Referee #1

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Retrieval of health-related UV doses from PAR measurements

Summary The manuscript starts from an interesting premise, namely using PAR and an analogue for UV dose and index measurements, but fails to meet general criteria for acceptance. While it provides a relationship between PAR and UVI and exposure (dose), it states that the agreement has 'good accuracy', but there is no indication in the manuscript that it has met any user requirement of what defines 'good' except their own, and there is no comparison to other predictive index and doses studies using an analogue. The English is poor throughout the article and on every page if not paragraph. This is most disappointing as the authors have highlighted a potential methodology for inferring UVI and daily exposure from PAR. Only after a significant revision should the manuscript be reconsidered for publication.

General Comments 1. One of the reasons that E-UVR measurements are expensive is that they need to be traceable, just like the PAR and SWR measurements. While the purchase cost of a PAR instrument is low, the cost to maintain calibration to a traceable quantity could be as high as that for UVR. 2. There is no indication of the uncertainty (a quantitative parameter) of the measurements used for the paper. Table 1 provides an indication of the instrumentation models but not the uncertainty of each data sample. Given that the instrumentation for SWR is a LI-200R it could be expected that the uncertainties are not those of a high-quality instrument, and there are no references cited for the uncertainties of the multiple measurands of the three data sets. Hence the manuscript is deriving parameters from numbers not traceable measurements. 3. In Table 1 or the text there is no indication of the quantity (irradiance or exposure) measured for each of the data sets, just the 'Data record'. Are they exposures (integration over the time period) or irradiances (average over the time period). Were they under sampled i.e. were they measurements taken every time period, or sampled at a higher rate than the time constants of the instruments? The authors need to demonstrate that the data they are using are traceable measurements. 4. The hypothesis testing of UVI only used data when SZA<60, and at solar noon(?), so the data availability figures in Table 1 are not reflective of actual number used. For example, at a maximum <600 solar noon UVI measurements could be used for Paris if the SZA was never less than 60 deg, but perhaps a 1/3 of a year SZA at noon > 60. The number of points used for each CMFUVI estimate need to be available. 5. Table 4 is largely irrelevant. 6. Figure 2 caption: How can 'absolute' differences be both positive and negative! These are just differences in the UVI. The significance of the range of the 1st and 3rd quartiles is irrelevant without user requirements. Similarly, the use of the term 'significant accuracy', remembering that 'accuracy' is a qualitative not quantitative term, is meaningless to the this reader. 7. Page 8 line 6: 'provides better accuracy' – see point 6 above. 8. There is scant discussion of the exposure (dose) estimation and basically only covers 2 thirds of a page, and the scales are relative rather than in exposure (or dose) units. To be consistent with Figure 2, Figure 3 should be in exposure units. 9. Figure 4 shows that

a majority of clear skies in both Paris and Sao Paulo give CMF>1, and provides this reader with a high degree of scepticism that the data sets of SWR are of any value or the SWR model parameter used were of any value. Again, the number of data points used for each fit would be useful.

Specific comments

10. There are too many errors of grammar and syntax and would almost be the length of the paper. It is suggested that any future version of the

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