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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Hourly resolved cloud modification factors in the ultraviolet" *by* H. Staiger et al.

Anonymous Referee #2

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The paper describes an improved method to get a cloud modification factors for the UV spectral range (UV-CMF), using the equivalent values for the solar spectral range (SOL_CMF) derived from measured values of global radiation. The latter are much more often available, so the results are of relevance for modeling UV radiation for times and regions were no UV data exist. The method and the way to get the results is described very detailed. Thus the paper is rather broad and generally could be compressed. However, the detailed description of the general problems, of the available data, and of the resulting consequences is of value. So I do not ask for general reduction of the length of the paper. It should be mentioned that UV means erythemal weighted UV, even if it is clear in the special issue of ACP that will be used for the paper. This is of relevance with respect to the spectral variability of CMFs. Regarding to

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Interactive Discussion
Discussion Paper

the title, the UV-CMF as function of the SOL_CMF are the final result: Thus this aspect (Eqs.3, 4 and 5, for Eq.5 see below) should be collocated in one chapter “results”, independent from the way how the data have been derived, especially for the readers who only are interested in high quality UV_CMF for their personal use. These results could be presented together with a short description of the uncertainties, especially if the daily UV dose is modeled on hourly values or using only noon SZA. (These information is given in the manuscript, the suggestion is only for a certain rearrangement for better reading.). The large amount of references, including detailed web-addresses, is very nice.

Some details: Page 182,Line 2: Proposal: ….. CMF based on solar irradiation (SOL-CMF) has been proven to be… 182/3 -8: Proposal: ….advantage because total global irradiance, the basis for SOL_CMF, is frequently measured… …. and includes all relevant effects for radiation transmission like cloud optical depth, different cloud layers, multiple reflection, as well as the distinct…… 182/15 and 26: No citations in the abstract. 182/21-23 Cancel:…using hourly resolved….and Research Program. The information “is validated” is enough for the abstract . 182 Proposal: mention the results shown in Fig .2 in the abstract because these are nice examples for yearly courses of solar and UV irradiances 183/8 Cloud optical thickness should be mentioned 184/ 17-20 redundant 184/25 The information to the measurements should be reduced 190/12-23 Proposal: Reduce to: A small empirical adjustment is used for large SZA, to improve the results from the pseudo-spherical geometry in the model against measured values. 191/19: Cancel: eventually , Proposal: finally 194/4: Why only one year for Potsdam? 196/11 Proposal: The reason for Eq.5 should be discussed more clearly. What does it mean for the user? 196/11 It is clear that Eq 5 leads to 1 for CMF = 1, but this should mentioned, or better the adjustment should be shown as adjustment on UV-CMF in stead on UVI. This, on the one hand, would fit with title of the paper and, on the other hand, would allow a direct use of UV_CMF. 199/2 Explain …. window of 12%...

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