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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Measurements of UV radiation on rotating vertical plane at the ALOMAR Observatory (69° N, 16° E), Norway, June 2007" *by* P. Sobolewski et al.

Anonymous Referee #2

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The manuscript addresses the significant issue of relating the UV measured on a horizontal plane to that on vertical planes. It investigates this for the erythemal UV, UVA and vitamin D_3 weighted UV irradiances. These latter irradiances are particularly relevant due to the latest findings showing the problems associated with vitamin D deficiency. However, there are a number of points that the authors need to address as outlined below.

A conclusion of the paper is that the multiplication of the horizontal UV by 0.5 gives a reasonable estimation of the daily exposure on a vertical plane. Firstly, what is the variation or the standard deviation of the data that provides an average of approximately

0.5? Secondly, the data in the paper is only collected over a very small time frame and it would be invalid to suggest that it applies for the remainder of the year. Also, some information for the solar zenith angle range, ozone range and cloud cover range over the measurement period would be useful. Consequently, comments along these lines needs to be included in the Discussion.

In section 2.1 at the end of the first paragraph, the authors write about the scans undertaken by the K&Z biometers. A scan generally refers to that by an instrument such as a spectroradiometer that collects data at a series of wavelengths. With a broadband instrument, the term scan does not apply.

Section 2.1, last paragraph, Figure 3 presents the irradiances on a vertical plane. What is the azimuth of this vertical plane? Alternatively, if it is rotating it should be outlined in the text.

Section 3.1, 2^{nd} paragraph has a reference to CIE, 2007 for the vitamin D_3 action spectrum. The year should be 2006.

Section 3.1, 3^{rd} paragraph reports the result that the largest difference between the maximum and minimum are for the UVA, then UVB and then for the vitamin D_3 weighted irradiance. The UVB that is referred to is the erythemal UV and this needs to be changed. It would also be useful to have a possible explanation for why this occurs. It may that the lower relative amounts of Rayleigh scattering at the longer wavelengths causes this.

In Figure 2, it may be useful to plot the difference between the UV GUV511 and the UV KippZonen.

In Figures 5 and 6, the captions refer to various 'action spectra'. The only action spectrum employed is really the erythemal action spectrum as the UVA is not weighted with any action spectrum.

In Figure 8, the caption refers to ozone changing between 200-550 DU in 25 DU steps.

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It should be made clearer in the figure which of the points are for the low ozone level and which are for the high ozone level.

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