**Atmospheric
Chemistry
and Physics
Discussions**

Interactive comment on "Typical distribution of the solar erythemal UV radiation over Slovakia" *by* A. Pribullová and M. Chmelík

Anonymous Referee #2

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Review of the manuscript:

"Typical distribution of the solar erythemal UV radiation over Slovakia"

by A.Pribullova and M.Chmelik

The manuscript contains results worth to be published in ACP. The methodology of presenting high resolution climatological maps using reconstructed surface UV daily doses is interesting and meets present tendency for dissemination basic info about variability of surface UV radiation to the public. The manuscript needs minor revisions and additional explanations prior to publishing in ACP. Following points should be addressed in the revised manuscript.

1) the authors suggest that the total ozone measurements at Poprad are representative

for the whole area of Slovakia (p.5922, l.24). Reviewer would like to see how large are spatial differences in total ozone over this region to support authors' suggestion. Thus, show differences between total ozone from measurements at Poprad, Hradec Kralove, and Budapest (or infer such differences from the Earth Probe total ozone gridded values). The period used for calculation of the total ozone climatology is not mentioned in the main text. We can guess that it is the same as that for the total radiation climatology.

2) the clear sky UV is calculated for ground level at 0.0 m (?, it is not clearly stated) assuming aerosol optical depth (AOD) of 0.4 (p.5923, l.25). Why such AOD value is selected? The altitude affect is simply modelled using the rate of 15% increase per 1km (p.5925, l.19). Please give more comments on this value. Is it verified by a radiative transfer modeling taking into account change of aerosols and ozone with height or it is derived from measurements. Is linearity for such constant is valid assumption? In Slovakia the highest regions are about 2.5 km, so please check if radiative transfer model gives increase of about 40% at this level and supports the assumed linearity.

3) The authors selected 0.5 h time step for the UV dose calculation (page 5924, l.11). I wonder how the time step affects a value of calculated daily integral, so few words are needed of accuracy of daily dose estimation using such long time-step.

4) the authors simulate daily dose for the first day of the month (it should be also mentioned somewhere in main text, section 2.4, not only in Fig.2 caption) using "appropriate monthly total ozone";. What does it means? For example, if 1 April is considered it will yield that the long-term monthly mean for April is taken as the ozone representative for this day. The reviewer has a feeling that the mean for the period 15 March-15 April is more appropriate as total ozone shows strong seasonal variability. Please estimate how large are the differences between these two assumptions. The same problem is with the snow cover distribution especially in month when the snow exists in the beginning of month and disappears during second half of the month.

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5) the authors uses cmf_UV dependence on altitude to attenuate clear-sky UV values, so their formula (1) is finally somewhat modified. Please specify how it is done. It is not enough to say that 2nd order polynomial function was used (page 5927, l.12). Show a new formula with consecutive number 2. In fact Table 2 shows that such function for some months is useless (see month with the correlation coefficient of 0.2-0.4). Moreover, the authors write that "cmf_UV can not to be expressed the simple polynomial functions in some month (July, January)";, page 5927, l. 21. So, a reader is quite confusing at this point what formula was finally used in the map preparation? Please state precisely.

6) I do not understand meaning of Fig.4. The actual monthly mean values in the 2002-2004 period or the long-term 1995-2004 are used in calculation of the model UV values to be compared with measured data (3-year averaged daily data?). I think that a comparison of measured UV data for selected 3-year period with a climatological UV pattern does not provide any information of the model quality. Sometimes large (or small) the model-measurement differences may appear as a results of specific weather pattern for the selected period. In Fig. Caption, I can see explanation for "grey columns". Symbols "squares", and "diamonds" are too small.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 5919, 2008.