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Atmospheric Chemistry and Physics Discussions

Interactive comment on "A new parameterization of the UV irradiance altitude dependence for clear-sky conditions and its application in the on-line UV tool over Northern Eurasia" *by* N. Chubarova et al.

Anonymous Referee #1

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The paper presents a parametrization of the altitude effect on different types of biologically effective UV related irradiance. It is a useful tool for the scientific community using UVI measurements and it is related with specific health issues.

The analysis and the presentation of the results is adequate for publication in ACP after the authors take into account the following suggestions/comments.

Equations 7-9. What are the units used for the solar elevation here ? Since the coefficients are very small compared ot the constant factor. What is their physical meaning ?

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Discussion paper

Line 259. Since we expect the majority of aerosols to be found at lower altitudes, how realistic is to assume that the SSA is non altitude dependent. ?

SSA: there are publications for SSA at UV wavelengths (e.g. Arola et al., 2009 based Kinne et al simulations) http://onlinelibrary.wiley.com/doi/10.1029/2009GL041137/abstract, that report much lower values. Is the SSA=0.96 realistic for UV wavelengths?

Figure 3 : it would be easier for the reader if more colors could be used as for example aeronet Europe and Livas could be mixed now.

The provided uncertainty of 1% and 3% has to be clarified more. Here model inputs have errors as they come mostly from measurements. So if the authors would like to provide an uncertainty budget they have to include the propagation of errors coming from the actual measurements and/or fitting procedure they have used.

As an example LIVAS 0.1 difference from AERONET is not representative of the actual determination of the AOD at a certain height but as a total column AOD comparison among AERONET and LIVAS.

In addition, the abstract reads: “UV amplification from different factors within a wide range of their changes with mean uncertainty of 1% and standard deviation of 3% compared with the exact model simulations with the same input parameters. ” It is not clear what the authors mean here.

L140-144: More about the threshold concerning vitamin D have to be reported.

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