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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Validity of satellite measurements used for the monitoring of UV radiation risk on health" *by* F. Jégou et al.

Anonymous Referee #2

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General remarks

The objective of the article is to show and evaluate results of a comparison exercise between satellite products (SCIAMACHY, OMI, GOME2), a Chemistry and Transport Model (MOCAGE), and ground based measurements performed in 2008 and 2009. The paper is well structured, instruments, data, and methods are described in detail. The investigation is embedded in the general ambition of contributing to a better understanding of increased skin cancer cases due to variations of UV relevant atmospheric parameters in relation to human behavioral factors.

However, the paper contains several redundant text elements and paragraphs. It would benefit from being written more concisely in the sense that the special findings of this study could be brought more into the focus. This means to become more consistent

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with the expressed tasks of presenting and evaluating the consistency between model results, satellite and ground based measurements. Especially, this concerns the chapters Introduction, Discussion and Conclusions. Some (not all) examples are given in the following comments:

Specific comments

Chapter 1 'Introduction':

The Introduction contains many well known (and true) facts and general statements but mainly without a cognizable link to what has been done -namely the evaluation of the consistency between UV modeling, UV measurements from satellites and ground instruments- and why this has been done. Half of the introduction addresses definitions of UV-A, UV-B, and UV-C, the description and spectral effects of an action spectrum, or gives more qualitative statements like 'exposure to UV can be deleterious or beneficial'.

The introduction would be more pathbreaking if already here the authors could describe more concretely and comprehensibly why an evaluation of the consistency between UV modeling, UV measurements from satellites and ground instruments contributes to a project that aims to study the link between increases of cutaneous cancer, atmospheric effects of UV-radiation, and human behavioral factors. For example, formulating one or more concrete open question(s) could be an 'appetiser'.

Chapter 9 'Conclusions'

Analysing the intercomparison results the authors came to the conclusion that is is difficult to account for the great temporal and spatial variability of cloud cover into retrieval algorithms or models. Certainly comprehensible but, when regarding all the papers related to UV within the last ten years, not a very new finding. This could be relativised.

Furthermore, the authors state that the quality of cloudiness forecast by the numerical MOCAGE model is insufficient and that MOCAGE and OMI products do not come to the same conclusions in terms of cloud cover. The authors mention that an investigation

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of this discrepancy and its correction will improve forecast models. This is certainly true, but an outlook to the future and a rather general statement. What would be an adequate and target-oriented approach here? On the other hand the authors state in the next paragraph: 'From now on, UV monitoring can be done by using satellite products (OMI, GOME2) and the UV forecasts by using modeling'. — Initially this phrase was somehow confusing to me.

In the last paragraph the authors recommend that new agencies and newspapers should broadcast UV information throughout the year with respect to skin damage in summer and vitamin D deficiency in winter. Is this a conclusion justified by or in accordance with the quantitative results presented in this study ?

Finally I would like to pose a question: Would a (little) step further in improving the prediction of clouds and their effects on UV actually raise the awareness of the general public with the consequence of a more adequate behaviour under certain UV conditions? Or would an improved education (e.g. in schools, in media etc.) about the danger of UV overexposure be due to a more efficient effect? Considering/balancing these aspects in view of the achieved results could be a point in 'Discussion'/'Conclusions'.

Summary

I recommend to rewrite 'Introduction' and 'Conclusion' (and chapter 8 Discussion), i.e. to make them more concise. Again, I would like to advise the authors to carve out how the results of the comparison constitute to a significant scientific progress by now. I recommend publication after a revision in terms of the aspects mentioned above.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 17375, 2011.