**Atmospheric
Chemistry
and Physics
Discussions**

Interactive
Comment

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

Anonymous Referee #1

Received and published: 29 June 2011

General comments:

This paper discusses the difficulties in capturing the spatial and temporal variability of surface UV radiation in satellite UV products and a chemistry transport model, focusing on the cloud effects. The satellite products and the model output are compared with field campaign measurements. The main conclusion is that the satellite products and the model should better account for the clouds, especially broken cloud fields and the radiation reflected from the clouds, to provide UV index of sufficient quality for health studies. The data and the comparisons are generally well presented, and the conclusion is supported by the given evidence.

Specific comments

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

p. 17378, line 22: I suggest to clarify that UVI and erythemal dose rate are basically the same quantity: "one unit equals to erythemal dose rate of 25 mW m-2"

p. 17380, line 20: Please add the version number of the OMI UV product: You seem to be using the current version, which is version 3 (also known as collection 3) data. Version numbers are important for future references. I appreciate that you have added the version numbers for SCIAMACHY and GOME-2 products.

p. 17385, lines 24-25: You state that the monthly climatological aerosol correction of the MOCAGE model is consistent with the approach in the OMI products. But in line 14 of page 17380 you mention that the current OMI algorithm does not account for aerosols. How can this be consistent?

p. 17388, line 15: You state that there is a systematic high bias of ca. 1 UVI in OMI products compared to SCIA and GOME-2 products. This might be true but the evidence given in the previous paragraph is based only on the difference in annual maximum values. This is surely not enough to detect any systematic bias in the product. For the RISC-UV data (p. 17392, line 26) you obtain a similar bias of 0.2 UVI for both OMI and GOME-2 products compared to the spectrometer, indicating that there is no significant bias between OMI and GOME-2 in this period. To provide convincing evidence for the systematic bias based on the annual data, provide difference plots of the data in fig.2 for OMI-CS – SCIA and in fig 3. for OMI – GOME-2, together with the values of the absolute mean differences for the two cases. Alternatively, I suggest to remove the last paragraph of section 5.1 (lines 15 -18 in page 17388) completely. The second sentence of this paragraph (lines 17-18) is irrelevant because the differences between the satellite products can be studied without the ground-based data.

p. 17388, line 27, and fig. 4: You mention, both in the main text and the figure label, that in fig. 4 the black symbols represent the UVI products, including GOME-2. I cannot see a symbol for GOME-2 in fig.4. Please add it.

Fig. 10, label: Please do not mention SCIAMACHY in the label as it is not shown in the

figure. Please add an explanation on what the error or variability bars represent in the middle and right panels (is it one standard deviation of the binned data ?).

p. 17395, lines 17 - 29: For me, fig. 10 is the most interesting plot because the cloud effect is the key issue in this paper. Therefore, the paper would be stronger if quantitative evidence based on 3D radiative transfer modelling could be shown for this qualitative explanation here. However, radiative transfer simulation of broken cloud fields is such a difficult task that I do not request for it unless you have such a capability readily available.

p. 17397, line 18: How do you know that all these new climatologies will be reliable? Have they been thoroughly validated? Please provide some evidence or remove the word "reliable".

Technical comments: I suggest the following corrections:

p. 17379, line 20: Atmosphrique -> Atmosphérique

p.17381, line 1: I suggest to rephase to: ... a larger positive bias up to 50 %. (remove "is observed")

p. 17388, line 6: SCHAMACHY → SCIAMACHY

p. 17391, line 28: this → these

p. 17391, line 29: leads → leads to

p 17400, line 25 and 17401, line 10: in term of → in terms of

fig.2 and 3 labels: campagn → campaign

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