

***Interactive comment on “An urban agglomeration effect on surface UV doses: Comparison of the Brewer measurements in Warsaw and at Belsk, Poland, for the period 2013–2015” by Agnieszka E. Czerwińska et al.***

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General remarks

The authors compare broad-band solar UV radiation exposure data derived from measurements by Brewer spectrometers taken in the city of Warsaw and outside the city. The paper is logically separated into sections. The abstract gives an overview of the paper. It mentions its most significant results. The SI is used throughout the paper. The title uses ‘UV exposure’, though ‘UV dose’ is used in the text. The same name should be used in the title and in the text. The number of Figures is adequate to il-

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lustrate the text. However, as will be addressed in more detail below, Figure captions need to be clear and provide sufficient details on what is presented. If a Figure consists of two graphs, the Figure caption should address both parts separately, for example by numbering them as a) and b). The axis names should be completed to mention the parameters in the graph. It is recommended to apply corrections to English grammar and language style of the manuscript, and also correct for the many writing errors. The method of separation between the albedo effect on the one hand, and the aerosol and cloud effects to UV exposure at the sites on the other hand is not clear. The authors assume that the albedo is 3% at Belsk and 6% at Warsaw. This difference of surface albedo is shown by model calculations to compensate for the difference in solar height (or latitude) between the sites, if the aerosol load would be the same. The remaining differences in the UV measurements are then interpreted as a result of differences in aerosol loads and cloudiness between the sites. Have you checked the real albedo at the sites? How about seasonal differences in albedo for example due to snow cover? The paper is recommended for publication after revision.

Detailed comments

Page 1, line 20: ‘increase of UV exposure for peoples’ replace by ‘higher UV exposure for people’

Page 3, Section 2: Coordinates of the sites and the types of the immediate surroundings should be included here, not only mentioned in the abstract.

Page 3, line 8: ‘Its’

Page 3, line 10: replace ‘diffusive’ by ‘diffuse’

Page 3, second paragraph: Is the higher contribution of diffuse irradiance to global irradiance the cause of the higher internal stray light of instruments, or is it just the lower global irradiance?

Page 3, fourth paragraph: Do you really mean ‘clear sky conditions’ that refer to no

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aerosol or low aerosol load, or do you mean 'cloudless conditions'? If you refer to the latter, the changed wording needs to be applied to the whole text.

Conditions of cloudless sky (or clear sky) were separated from the relative increase of irradiance over time around noontime. Using only this criterion, the separated 'cloudless cases' may still contain cases of clouds that do not occlude the sun. Have you checked by cloud observations or cloud imaging data, how good your selection criterion to find real cloudless cases is?

Page 3, line 28: You refer to the erythemal action spectrum by CIE (1987). Probably, you have taken into account the corrections, as discussed by Webb et al. (2011), *Photochem. Photobiol.* 97, 483 – 486. If so, the citation should be added.

Page 4, line 17: replace 'moment' by 'time period'

Page 5, last paragraph: You state that the main cause of scatter in the interpolated UV irradiance values is the first and last spectrum of the time period. Why did you not leave those two spectra?

Page 6, line 11: replace 'an increase of BS064/BS207' by 'a higher BS064/BS207'

Page 6, line 31: replace 'decline' by 'difference'

Page 7, line 7: 'radiation'

Figure captions are incomplete and partly confusing. The caption of Fig. 3 says 'The same as Fig. 1', but the ratios are calculated for total ozone values measured simultaneously at Belsk and Warsaw'. Does the upper part of Fig. 3 show ratios of erythemal exposure? Is it measured or modelled? Or, does it show ratios between measured column ozone at the sites? The vertical axis only states 'Belsk/Warsaw'. The lower panel does obviously show total ozone at the sites, but it is not mentioned in the Figure caption. Caption of Fig. 4 should mention that it refers to 'modelled ratios'. Figure 5 should mention that it refers to 'measured ratios'.

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