

Interactive comment on “UV measurements at Marambio and Ushuaia during 2000–2010” by Kaisa Lakkala et al.

Anonymous Referee #1

Received and published: 5 March 2018

The manuscript presents results of measurements of the UV index with multi-filter instruments at 2 sites in southern South America and Antarctica between 2000 and 2010. The results show clearly the strong effect of the Antarctic ozone hole on daily maximum levels and on daily totals. Very careful measures for QA/QC were applied to the data and are described in detail in the manuscript, because the sensitivity of the instruments was not stable. This leads to a final high quality dataset of daily values over 10 years, which is a significant contribution to our knowledge of distribution and variability of the levels of erythemally weighted UV irradiance at high southern latitudes. Therefore I think the manuscript is well suited to be published in ACP.

The manuscript is clearly structured and well written and the abstract gives relevant information. A few suggestions should be considered by the authors prior to publication:

C1

The authors should give an estimate of the absolute uncertainty of the presented UV index data.

The authors state correctly that for clear sky conditions the solar zenith angle, the ozone amount and the coverage of the ground with snow are the most important parameters. To show the effect of ozone and snow more specifically, an additional figure with the time series of the UV index at a fixed solar zenith angle (e.g. 70° or 75°) could be impressive. Then, potentially, the relation between the UV index and ozone could be interpreted not only qualitatively, but also quantitatively (e.g. in terms of the radiation amplification factor).

I wonder that in Fig. 7a and 10a the variability of the ratios maximum/mean and minimum/mean is quite similar throughout the year, even on the days around winter solstice, when the absolute level of the mean is extremely small. Therefore very small differences at this time should give much higher variability of the ratio compared to the other days of the year.

Technical details:

Several times the term “daily mean” is used, but sometimes this is a bit misleading (e.g. p.4, l.8 or legend of Fig. 8). “Daily mean” should not be understood as the mean over the day, but as the day-to-day variation of the mean, where the mean is calculated from the respective days of each year of observations.

p.13, l. 5: “did not reach” instead of “did not reached”.

p. 17, l. 8: “Fig. 9” instead of “Figs. 9 and 10”.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-1193>, 2018.

C2