

Review of the study entitled “Updated trends of the stratospheric ozone vertical distribution in the 60°S-60°N latitude range based on the LOTUS regression model” by Godin-Beekmann et al.

The study updates results from the last LOTUS report on ozone trends in the stratosphere and will make an important contribution to the next Ozone assessment report. The text is quite polished and to my view it is ready to be published accepted after some improvements to the figures for better visualization. Well done to the authors. You can find my comments below.

Regarding seasonal variation of proxies: It is concluded that this study gets better results compared to LOTUS19 due to the continuous improvement of satellite and ground-based records and due to the updated version of the LOTUS regression trend model which now takes into account the seasonal variation of the predictors. Some readers may not understand what you mean by “seasonal variation of proxies”. The lines 392-399 point to lines 248-249 (section 3) for the seasonal variation of the predictors, but Section 3 does not explain what you mean by seasonal and non-seasonal variation of the proxies. It would be good to clarify how you let the proxy to have a seasonal and non-seasonal variation. If for example, by “seasonal variation of QBO at 30 hPa from 01/2000 to 12/2020” one should understand that it is the monthly time series of equatorial winds at 30 hPa from January 2000 to December 2020, and that the respective non-seasonal variation of QBO is something different, that should be explained. Potentially a Supplement with some graphs might help. My point is that the readers should know how a proxy with seasonal and non-seasonal variation looks like.

Line 297: Interestingly, the trends from SAGEII-SCIA-OMPS data change to negative above 2 hPa which was also not the case in LOTUS19.

Line 427: correct “CMI” to “CCMI”.

Line 437: Remove one “set of”.

Figs 2 and 4: It is not easy to follow each line between too many error bars. Potentially the error bars could be lighter, and the trend lines thicker. Also, the minor tick marks in vertical axes of pressure [hPa] are barely seen. The minor tick marks in fig 7 cannot be easily seen as well.

Fig 3: Is there improvement when the Ozone-MOD is not included?

Fig 4: I would put the plots side by side as in other figures, i.e., Lauder (left), MLO (middle), Alpine stations (right).

Fig 7: On the vertical axis on the right plot, the 10^2 is on top of the axis and the 10^0 is at the bottom. Shouldn't they be upside down?

References: the status of papers marked as “to be submitted” and “in review” should be updated before publication.