

This paper reports on ozone changes observed since the 1960s at the Amundsen-Scott South Pole Station (SPO). A particular focus lies in the winter months just before the period of rapid ozone depletion in spring ("ozone hole period"). This time of the year is covered by full moon (FM) measurements by Brewer and Dobson spectrophotometers complemented by regular ozone sondes and MERRA2 reanalysis data. Regular direct sun (DS) measurements by Brewer and Dobsons are also used to contrast the ozone changes in the winter months to other seasons and latitudes. Wintertime ozone declined by about 12% from the pre-1980s until the late 1990s, a larger change than observed at lower latitudes and in other seasons, except for the ozone hole period. The paper is well written and results are well presented. After addressing some rather minor issues as outlined below, the paper will be well suited for publication in ACP.

First of all, we would like to thank Mark Weber for his favorable comments.

p. 6, l. 15ff: A great part of the paper deals with the adjustments of the various datasets. As a reference for adjusting all data types the long-term Dobson data is used (p. 7, l. 14). For justification only the study by Bernhard et al. (2005) is cited. I think a few more sentences are here needed to explain why the Dobson record is most suitable as a reference dataset here.

The Dobson record was thoroughly reanalyzed by Evans et al., 2017. It was mentioned before in Section 2.1, and we added that reference again here. Also, we reminded that the used Dobson data included the correction for the temperature dependence.

p. 7, l. 32: "... remove that bias for some of the plots". So the corrections are only applied in the plots but not for the data. I find this a bit awkward, why not say simply the data has been corrected, which would be important if the adjusted data is made publicly available (see my later comments on Data Availability)

Sorry for the confusion. Indeed, the data has been corrected. The text is changed to reflect that. Anyways, October-February data are not the main focus of this study.

p. 8, l. 5: I think that the bottom panel is not showing what is described in the main text and figure caption. MERRA2 data are the same as in the top panel, but all other data have been adjusted (not the other way around).

It is probably related to Figure 3 (p.8, l.15). The text is correct. The data (MERRA-2, Brewer, and ozonesondes) without any adjustments were used in four panels on the left side. Plots on the right side show the same analysis, but adjustments applied to MERRA-2, ozonesonde, and Brewer. Major adjustments (~8%) were applied to MERRA-2 data for April-August in 1980-2004 (SBUV period). All other adjustments are relatively minor. We added a few words to the Figure 3 caption to make this clearer.

p. 11, l. 5: "four seasons" --> "three seasons"

Corrected

p. 11., l. 25: not clear what is meant with "analysis of the residuals". Please specify. A fit of only the EESC curve to the data will result in large residuals as the short-term variability is not fitted. Maybe it would be good to show some plots of residuals to make the point here (could be put in the appendix).

We agree. The statement about the residuals is not needed here. The main message from the EESC fit is discussed in the next paragraph: The fitting results for April-August are very similar. We simply removed the statement about the residuals.

Fig. 8 (and other plots): Light blue color lines are difficult to distinguish, in particular with different line styles. The light blue color is not a particular good color for color blind people. I strongly suggest to use a different color. This applies also for the other plots using the same color.

Corrected. The cyan lines were replaced with black lines in Figure 8. We also replaced the cyan line in Figure 7 with a thick gray line.

p. 14, l. 7: "Rapid ozone destruction on polar stratospheric clouds in the springtime Antarctic vortex affects ozone levels in subsequent months everywhere in the southern hemisphere, but its impact on the polar ozone should be at least as strong as anywhere else." I find this sentence a bit awkward. I think what was meant to be said is that the polar ozone loss (ozone hole) is not affecting the wintertime ozone, so that gas-phase chemistry is only relevant in winter. Apart from ODS gas-phase chemistry some dynamic contributions can not be ruled out as suggested in the main text. I think this should be mentioned here as well.

The polar ozone loss has some impact on SH ozone in summer and fall and may even impact ozone in wintertime. But perhaps the statement is too strong and the point about some dynamic contribution is also correct. We reworded that statement:

*Wintertime polar ozone is affected by all the factors contributing to the changes in the ozone layer, probably, to the largest extent. The contribution from dynamic factors to ozone variations in the polar region is probably similar to that anywhere else in the southern middle and high latitudes.*

p. 14, l. 17: The data at SPO, in particular the adjusted data should be made available publicly for tracability.

The temperature-corrected Dobson data are available from <https://gml.noaa.gov/aftp/data/ozwv/Dobson/Publications/>. Corrected Brewer FM data used in this study is available from the Supplement to this paper. It is now stated in the Data availability section.

p. 34, l. 4: "in increasing" --> "is increasing"

Corrected