General part

We thank the anonymous reviewer for his/her helpful comments.

Detailed points

(1) Sec. 2. SCIAMACHY. You should add a discussion about SCIAMACHY validation and aging studies.

Some separate section giving an overview about potential instrumental and algorithmic issues has been added to the article. There, findings from validation studies which cover SCIAMACHY limb ozone is given attention where relevant.

(2) p. 11274, line 10: How do you estimate the error of the mean value? Do the individual error estimates of measurements play any role in the error calculation?

Any of the zonal monthly means, which is involved into the ozone time series considered, is typically composed of several hundreds of single measurements. Thus, the random error of zonal monthly means can be deemed as negligible. Trend uncertainties are calculated, rather, from the regression covariance matrix. This has been explicitly mentioned in the text.

(3) p. 11274, line 10: Is mean the best estimator or should you use a weighted mean or median?

The errors of single measurements are expected to be normally distributed, no issue with outliers is known. No temporal variation of the measurement errors is observed. Hence, arithmetic means are appropriate and used in the article. This is now mentioned in the text.

(4) p. 11274, line 14: South Atlantic Anomaly. You are giving data exclusion limits but are these satellite coordinates or coordinates of the measurements? To my knowledge SAA affects directly the functioning of the instrument.

You are right: the SAA affects directly the functioning of the instrument. The exclusion coordinates were firstly determined for the satellite location and converted then to tangent point coordinates which are given in the text. The typical difference in latitude with respect to instrument coordinates is estimated to be around 20°.

(5) p. 11274, line 26: It would be useful if you could provide some information about the autocorrelations you have observed in the fitting residuals.

The estimated values of autocorrelation are similar to those shown in Mieruch et al.(2012). It is now referenced in the text.

(6) p. 11278, 11-15: Are the 3-4 month harmonics included in the fit? If yes, how large are their amplitudes compared to annual and semi-annual terms.

Harmonics of 3 and 4 month periods are included. Typically, these terms improve the closure between the fitting curve and time series, but don't change the amplitude of the harmonic part of the fit substantially. This is now clarified in the foregoing paragraph. Curves showing 3 and 4 month harmonics only are now added to Figure 1 to 4 (and the following two figures).

(7) Sec. 5. Results: The results show rather large changes in ozone. Usually the trends are shown by

% in decade. In order not to confuse with other publications, I would recommend using decade as a time unit.

The unit of trends is changed into % per decade throughout the article.

(8) a) Sec. 5 Results: It would also be interesting to see the fitted solar and QBO contributions in the same ways as ozone in Fig. 7.
b) Sec. 5. Results: It would also be interesting to see the fitted solar and QBO contributions.

The article has been extended by an appendix describing the QBO and solar cycle contributions and illustrating them by two additional Figures similar to Fig. 7.

(8) Fig.7. This picture does not show where the results are statistically significant. Please add shading a similar aid.

Non-significant trends are now indicated by hatching.

(9) Sec. 6.1. Comparison of trends. It is a little bit unfortunate that authors do not perform a comparison of SCIAMACHY, MLS and OSIRIS measurements using collocated measurements. It would be valuable to see how the instrument-instrument biases are developing as a function of time. This would give some information about the question if the detected trends are partly resulting from instrumental aging, changes in sampling patterns (spatial or diurnal) or similar processes. For example, OSIRIS PM-measurements covered tropical regions only during the early years of the mission. I would like to see that authors provide some discussion about these possibilities.

(a) Mieruch et al. (2012) pointed out that instrument comparisons were not substantially changed using either collocated data or directly comparing zonal means of gridded data (this even applied to occultation instruments with sampling patterns clearly different from SCIAMACHY). This is now discussed in Section 2. Following Mieruch et al.(2012), trends are determined from non-collocated data.
As a further check, collocating data from SCIAMACHY and OSIRIS has been proven to have practically no effect on the trend comparison between these instruments. This is now discussed in Section 6.1..
(b)With respect to OSIRIS, the comparison is based on its data measured at AM local times only. This has been described in more detail in Section 6.1..
(c) The possibility of instrumental/algorithmic issues being reflected by the observed ozone trends is now discussed in a separate section, see also point (1).

References

Mieruch, S., Weber, M., von Savigny, C., Rozanov, A., Bovensmann, H., Burrows, J. P., Bernath, P. F., Boone, C. D., Froidevaux, L., Gordley, L. L., Mlynczak, M. G., Russell III, J. M., Thomason, L. W., Walker, K. A., and Zawodny, J. M.: Global and long-term comparison of SCIAMACHY limb ozone profiles with correlative satellite data (2002-2008), Atmos. Meas. Tech., 5, 771-788, doi:10.5194/amt-5-771-2012, 2012.