

Response for the Review (acpd-14-c1626-2014)

Kazutoshi Sagi

Dear Reviewer,

Thank you very much for your comments on our paper. We will introduce all suggested corrections. Below we present responses to your specific comments and questions.

Specific comments

Reviewer:

As the instrument is only operated in 2009/2010, please indicate the fact in the abstract.

Author:

>> We added the period.

Reviewer:

It is a bit confusing in the figures not to use one one x-axis. It might help to indicate the day of the year in the global maps and in the text as well.

Author:

>> The days of the year is also indicated in the brackets following the date for the global maps of N₂O and O₃. We fixed that in the text as well

P7890:

Reviewer:

3: What does high sensitivity mean here and later on in the paper?

Author:

>> High sensitivity means that SMILES has low noise on measurements and thus high precision and good measurement response in the height range used in the paper. (see Kasai et al, 2013)

Reviewer:

13: How good do SMILES and SMR fields agree?

Author:

>> SMILES and SMR fields capture similar features on the maps. On the other hand, SMR fields show larger amplitudes of the variation of ozone and small features that do not appeared in the SMILES fields. We believe that this difference is produced by the noise on the SMR measurements.

P7891:

Reviewer:

24: the instrument only detects latitude on the south side?

Author:

>> This is my mistake. The correct range of altitudes is from 38S to 65N.

P7892:

Reviewer:

3: How well does EQL70 represent the vortex edge?

Author:

>> Please see the response to the related comments from anonymous referee #1.

P7892:

Reviewer:

3: What is the step width of the measurements?

Author:

>> We made a table for the specifications of both instruments.

P7894:

Reviewer:

11: described by (Frisk et al.,2003), -> Frisk et al. (2013) / also line 24

Author:

>> Corrected.

P7896:

Reviewer:

2: adiabatic vortex descent -> diabatic...

Author:

>> We have corrected the wording.

P7898:

Reviewer:

3: 550K is not in the figures.

Author:

>> We have changed the value to match with the figure (above 550K -> at 600K).

P7899:

Reviewer:

9: 65S?

Author:

>> Sorry no. It should be 65N.

7900:

Reviewer:

Description of Fig.8: Where does the loss (day 12-29, 650K) in SMILES come from? It is not seen in SMR data. And the difference in maximum loss height (day 75-90) between both instruments?

Author:

>> Concluding the first point, because the SMILES results reflect not the pole center but lower latitudes near the vortex edge, the apparent loss (day 12-29, 650K) in SMILES is due to an overweighting of the losses near the vortex edge. SMR loss is lower than SMILES below 500K. This is because SMR ozone measurements tend to over estimate ozone at these altitudes due to lower sensitivity/measurement response. We have modified the text.

Reviewer:

How do these results compare to findings from other instruments.

Author:

>> We will add a new section comparing with other studies.

Figures:**Reviewer:**

Fig.2a: Globe is too small, maybe also reduce the latitude range. Fig 3. and 6.:
Extent the range of date until day 90, similar to the other figures. Increase the
size of the figures and the legend. Fig 4./5.: Why not spend some colours to the
figures to make them easier readable? Fig. 8: Font size of axes and legend is
too small.

Author:

>> We will fix all figures to be nice.