

Responses to Reviewer # 1

We thank the reviewer for the comments. We have corrected a mix-up of Figures 3 and 4. Text has been revised as requested by Reviewer 2 and references have been updated. Higher quality figures have been submitted.

Responses to Reviewer # 2

Comment 1:

The way the abstract begin with results of Clain et al (2009) seems a bit confusing to me. I suggest to reformulate the beginning of the abstract.

Response 1:

The sentence has been re-written.

Comment 2:

The discussion of the differences between climatologies on figure 2 would have been easier if maps of differences were presented on figure 2. Page 10173 Line 28 and Page 10174 Line 2: quantify the differences instead of using the term “appear”, it is too vague.

Response 2:

Thank you for this thoughtful comment. We considered adding the requested difference plots (Figure 1, right two panels), but after looking at it we realized that this figure may cause some confusion. The difference of the climatologies is not the real trend that takes into account all the factors given in the regression model equation. In addition, the difference between climatologies is subjective as one can choose different years for most recent and most remote time periods. It is important that, when we calculate trend we account for the accumulated change over the years when data is available. We changed the wording from of Page 10174 Line 2.

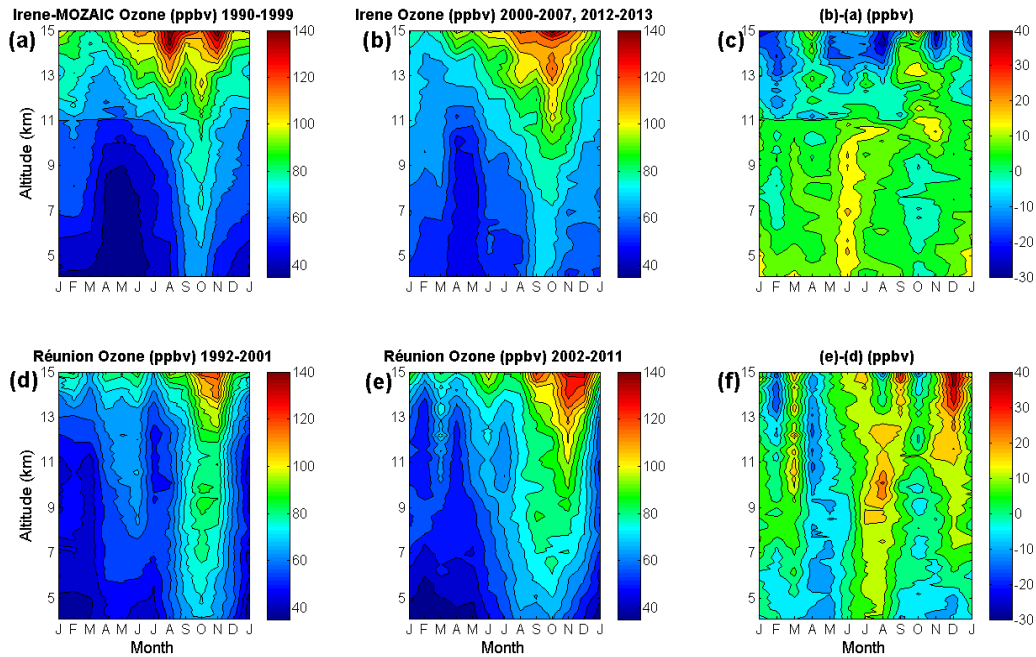


Figure 1. Earlier and later period ozone cycles for Irene and Reunion along with the corresponding differences.

Comment 3:

Page 10173 Line 16 and following: It seems that there is an inversion between figure 3 and 4 within the text.

Response 3:

Thank you for pointing this out. This is now corrected.

Comment 4:

Page 10173 Line 22-25: What kind of information do we get from the comparisons of total columns (here with SAOZ)? Do we have more direct information on measurement accuracy within the troposphere?

Response 4:

The Reunion University sondes, like those at Irene, follow one of the protocols that WMO intercomparisons recommend as most accurate. The references are all provided in the paper: (Johnson et al., 2002; Smit et al., 2007; Smit and ASOPOS, 2011; Thompson et al., 2007) . Accuracy in the troposphere is ~5% throughout the profile.

Comment 5:

Page 10179 Line 3: "...perhaps suggestive of more subsidence than in the 1990s..." Could you not verify this objectively with meteorological fields analysis?

Response 5:

We removed this statement from the paper as the required meteorological analysis is beyond the scope of the present article.

Comment 6:

Page 10179 Line 4: How can we see what's happen above 11km with figure 7?

Response 6:

The statement in question is also now removed.

Comment 7:

Page 10179 Line 5-11: Could you precise what is the link between convection and ozone? It seems to me too much implicit as it is.

Response 7:

This section of text has been removed, because we agree with the Reviewer; the implications are too subtle

Comment 8:

Page 10179 Line 16-19: I think you must more explicitly explain how you are calculating the sensitivity to a change in 330 K PV.

Response 8:

Yes, this is now explained in sections 2.3 and 3.2.1.