

We are pleased to inform you that the Co-Editor report for the following manuscript is now available:

Journal: ACP

Title: Dynamics and composition of the Asian summer monsoon anticyclone

Author(s): Klaus-Dirk Gottschaldt et al.

MS No.: acp-2017-420

MS Type: Research article

Iteration: Minor Revision

Special Issue: The Modular Earth Submodel System (MESSy) (ACP/GMD inter-journal SI)

The Co-Editor has decided that minor revisions are necessary before the manuscript can be accepted. Please find the Co-Editor Report at https://editor.copernicus.org/ACP/ms_records/acp-2017-420.

We kindly ask you to revise your manuscript accordingly and to upload the revised files, a point-by-point reply to the comments, and a marked-up manuscript version showing the changes made in your File Manager no later than 17 Feb 2018: https://editor.copernicus.org/ACP/file_manager/acp-2017-420. Please find all information on manuscript submission under https://www.atmospheric-chemistry-and-physics.net/for_authors/submit_your_manuscript.html.

Your revised manuscript will be reviewed by the Co-Editor and you will be informed about the outcome by separate email.

Besides adjustments requested by the Co-Editor or Referees, please check your manuscript carefully for typos, missing co-authors and their affiliations, terminology, updates of data in tables, or updates of variables in equations. All these have to be clarified with the Co-Editor and therefore have to be included before you submit your revised manuscript. Should your manuscript be finally accepted it will not be possible to include such rather substantial changes anymore when your manuscript is in final production (proofreading).

Co-Editor Decision: Publish subject to minor revisions (review by editor) (07 Feb 2018) by Marc von Hobe

Comments to the Author:

Generally, the structure of the main text is quite good. The storyline through the sections and subsections appears logical, the main findings are nicely summarized in Section 7, and some lengthy "side excursions" have been removed.

We thank the Co-Editor for his review and helpful comments. Our changes to the manuscript are highlighted in the markup version, with color coding according to Fig. 1. Please note that newly inserted references and modified figure numbers are not always highlighted (for technical reasons). Table 1 summarizes the renumbering of figures instead. Changes to citations are noted in our responses to your comments below.

However, the paper is still moving on the edge of being "information overload", especially with the large amount of cross referencing to the Appendices and Supplement. Some of this extra material is important and well justified, but in some cases, I'm not sure if it is really necessary and if the placement in an Appendix/Supplement is the correct choice. Please consider the following specific remarks and suggestions in that respect:

Appendix A: from the title of the Appendix, this is not different from Section 6.1, and some of the extra discussion of processing inside the ASMA could be blended into that Section in the main text. But much of the material, such as the comparison to CARIBIC and Satellite observations and the model sensitivity studies seem more appropriate in the supplement (some of the figures are

already there, e.g. Figure S10) to convince those readers who have doubts about the model lighting NO_x.

Done.

Appendix B: I think this could be shortened a bit and added to the main text. Figures B1 and B3 can be added to Figures 4 and 3, and the discussion added to Sections 4, 5 and 6, maybe by adding subsections. I don't see that NO_y is so much less important than the other material discussed in the main text, and I don't think it will disrupt the main text too much. You mention all tracer-tracer relations in the first sentence of Section 4.1 and state that some are shown in that Section and others in the Appendix. But a reasoning why the NO_x relations are not discussed in the main text is not given.

Done.

Appendix C: does this "primer" contain any information that is not available in the literature? I don't think it is really needed and suggest referring to one or a few papers (or even books) where tracer relations are introduced in some detail.

We found no basic text-book description, just applications of the method in papers. Moved to the supplement and added two references.

With respect to the supplementary figures, some of them are referred to and discussed in the main text in just the same way as normal figures (e.g. page 11, line 26, page 15, line 20, and quite a few others), and I don't see any harm including some of them in the main part of the paper. Extra figures typically don't disrupt the story line, and there is not an official limit with respect to the number of Figures in a paper. I'm thinking that especially Figures S1, S11 and S16 would be nice to have in the main part of the paper: they are very interesting and highly relevant and do not just provide extra documentation and reproducibility.

We agree. Figures S1, S11 and S16 are now part of the main text.

For the multi-year information, data comparisons and model sensitivities, these are indeed appropriately placed in the supplement if you do want to show all of them. Maybe you can add a bit of discussion in the actual supplement, e.g. move some of the material from Appendix A into the supplement, so it becomes a little more independent and rounds up all "extra topics". In fact, you may want to consider giving the supplement a bit of structure, e.g. model comparison to satellite data, inter-annual variability, process sensitivities in the model. In that case, the referencing in the main text to this "extra material" becomes much clearer.

This is a good idea, the supplement is structured now.

Besides considering the suggested rearrangements into main text and supplements, the following technical corrections need to be made prior to final publication:

The in-text referencing of the figures is not in the correct order (e.g. Figure 2 should be referred to earlier than Figure 7). In particular, Figures discussed in detail later are referred to in quite random order in Section 3. Please either renumber your figures, or adjust the text so that the referring is in the correct order.

The order of figures was intended to reflect the storyline. Now they are ordered according to first referral in the text (Table 1).

On the same note, Section 5 discusses in detail what is seen in Figure 4, but the subsections 5.1 to 5.4 correspond to e/f, c/d, a/b and g/h respectively. I suggest changing the order of the gases

shown in the Figure according to the Section ordering, i.e. O3 on top, then CO, then HCl and then NOx.

Done.

Page 6, line 4: I don't understand the word "enhanced" here. If you refer to the vertical gradients in O3 itself, then please delete "Enhanced". If you mean something else, then please explain.

Reformulated.

Page 6, lines 13 and 16: please add some literature references that HCl is a good tracer for stratospheric O3 entrainments and that daytime NO is a good proxy for NOx.

HCl: The reference to Marcy et al. (2004) was intended for the whole sentence, but placing it at the end might indeed be misleading. We moved the reference to Marcy et al. to the first part of the sentence and added the reference to Park et al (2008), who used HCl as stratospheric tracer in the ASMA.

NOx: We restricted the statement to the UT, where daytime NO/NO2 is about 12 (Seinfeld & Pandis, 2006).

Page 9, line 20: the circled area looks more like 300 to 500 hPa below the TP rather than 200 to 300 hPa. Please check this and correct or clarify!

Corrected.

Page 13, line 14: should be ("2" in Fig. 6) instead of ("2" in Fig. 4)

Corrected.

Caption Figure 3: it should be (b,e) and (c/f) in lines 4 and 6

Corrected.

Caption Figure 4: please remove the #+ in front of the Figure numbering

Done, also in the footnote on page 12.

Caption Figure 6, line 9: between 200 and 700 ppb NOx seems incredibly high. Please check and correct this!

Corrected to pmol mol⁻¹. We also changed "mol/mol" to "mol mol⁻¹" throughout.

old	new	old	new	old	new	old	new
1	2	A1	10	S2	S4	S10	S2
2	4	A2	S3	S3	S5	S11	11
3	8	A3	S12	S4	S6	S12	S14
4abcdef 4gh	5efcdab 6ab	A4	S13	S5	S7	S13	S15
5	7	B1abcd	6cdef	S6	S8	S14	S10
6	12	B2	S11	S7	S9	S15	S17
7	3	B3	9	S8	S16	S16	13
8	14	S1	1	S9	S1	S17	S18

Table 1: Figure numbering; old = manuscript version 20171222, new = 20180221

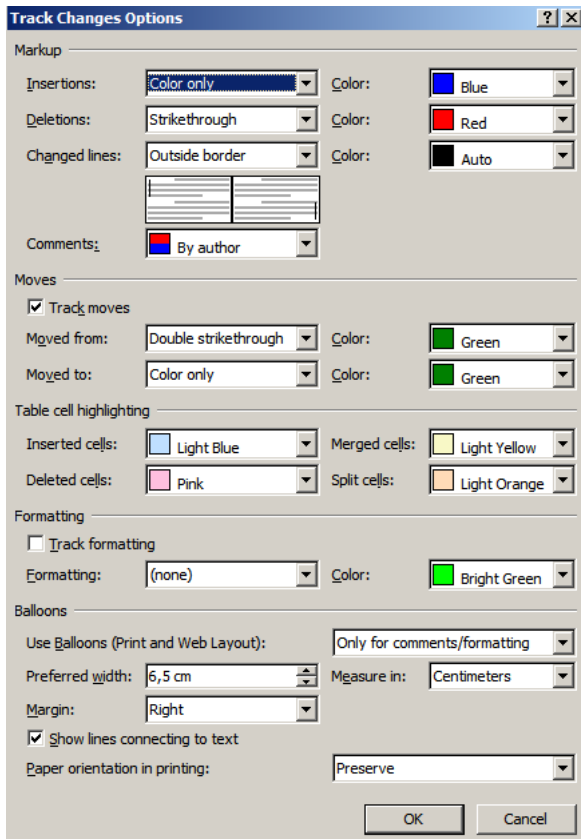


Figure 1: Markup for changes in the manuscript.