

## ***Interactive comment on “Global CFC-11 (CFCl<sub>3</sub>) and CFC-12 (CF<sub>2</sub>Cl<sub>2</sub>) measurements with the Michelson Interferometer for Passive Atmospheric Sounding (MIPAS): retrieval, climatologies and trends” by S. Kellmann et al.***

**Anonymous Referee #1**

Received and published: 15 September 2012

Review of Kellman et al., Global CFC-11 and CFC-12 measurements with MIPAS: retrieval, climatologies, and trends.

This paper reports on 10 years of measurements of CFC-11 and CFC-12 by MIPAS. It includes an overview of the retrieval method, the climatology of both species, and trend analysis.

I really liked this paper! I suggest publication provided the following minor comments can be addressed. Part of the reason I really liked the paper is that it was succinct,

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to the point, and provided potentially important new observations while not trying to “over interpret” the observations. While I choose to remain anonymous, let me say that I usually provide much more challenging reviews. I do not see anything in the submitted paper to challenge. And, Thomas gave a very nice talk on this study at a recent meeting I had intended. While of course I am basing my review solely on what is written, I was looking forward to reviewing this paper, because of the excellent talk.

Major Point:

1. My only major point (i.e., very important I really hope will be addressed) is that the color scheme used for Figs 12 to 16 is, for some of the panels, chosen in a manner that not much quantitative info can be read from the plots. For instance, in the text, it is stated  $d\text{CFC-11}/dt$  from Elkin’s group is about  $-25$  pptv/decade. The blue shade for  $-25$  pptv/decade in the top panel of Fig 12 is essentially identical to the blue shade used for  $-40$  pptv/decade. Also, there are large patches of red in some of these panels.

I think the modeling community will be keen to compare results of CCMs to the data in this paper.

I also know a SPARC-led climatology is under development.

Regardless, each paper needs to stand on its own. For this paper, I would like to see tabular representation of the values shown in every panel of Figs 12 to 16, either in supplemental material or a website the authors will maintain for the next 4 to 5 years.

I think the color bars can be improved to provide more detail for many of the panels in Figs 12 to 16, but this is less important than providing easy access to the numerical values of the trends shown in these figures.

Minor Points, substance:

1. Page 18328, lines 23 to end of paragraph: I recall that LIMS also measured CFC-11. If so, should include a LIMS reference.

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2. Page 18329, lines 18 and 19: The sentence “We consider . . . nominal mode . . .” was confusing upon first reading, because I tried to connect it to the FR and RR modes in the prior few sentences. I thought one of these must be the nominal mode, not that FR and RR both have a nominal mode. I now understand. But I suggest making this clearer, for an uninitiated reader.

3. Page 18330, line 6: I am not sure what is meant by “distinct data analysis schemes”. Does this mean “different algorithms”?

4. Page 18342, line 17: suggest at least one other reference in addition to the one used, that reports on there being relatively young air in the lower stratosphere. Should refer to an early paper on this topic. I could suggest some, but these are easy to find. It looks strange to self cite here. Ok to keep the Stiller reference, but please add at least once citation to an early paper.

5. Fig 11 and 14 are NICE . . . but no need for so many zeros for the altitude designation. Please use simple integers and a slightly larger font, so that the altitude designation is more apparent.

Minor Points, grammar:

1. Page 18328, line 11: suggest “have been” rather than “are”

2. Page 18328, line 123: suggest “Independent”

3. Page 18329, line 4: in case anyone is unclear, suggest “MIPAS spectra” rather than “spectra”

3. Page 18329, lines 16 and 17: suggest “interferometer slides, MIPAS was operated from January 2005 in the reduced . . .” (do not need the word “on”; it will be clear you mean from January 2005 onwards the way I have suggested writing this phrase)

4. Page 18329, line 25: suggest “under consideration were obtained” (the “here” part is obvious and “measurement” is later used; I am sure the lead author’s English is much

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better than this reviewer’s German!)

5. Page 18329, line 17: should be “retrieval study (von Clarmann et al., 2003a).”

6. Page 18331, line 13 and line 21: I prefer “to be 5%” and “to be 10%”. The phrase “to 5%” could have a different meaning, although I suspect the vast majority of the readers would understand regardless of which phrasing is used.

7. Page 18831, line 28: “artifacts” is not spelled correctly (the spelling used here refers to an actual word, but one with a different meaning than intended; also this word is spelled differently on the next page)

8. Page 18335, lines 7 and 8: how about “fit” rather than “fitted”; also should place a comma after CFC-11

9. Page 18339, line 15: should used “altitude”

10. Page 18339, line 18: did you mean “one or both data subsets”? Sentence as written does not make sense.

11. page 18341, line 11: this is a very long paragraph, too much too digest. Suggest a new paragraph at “Differences between . . .”

12. page 18341, line 15: suggest: “because stratospheric circulation could change”.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 18325, 2012.

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