We would like to thank the reviewer for useful comments. In the following we answer the specific comments (included in "**boldface**" for clarity) and, whenever required, we describe the related changes implemented in the revised manuscript.

Anonymous Referee #2

This manuscript describes the retrieval and interpretation of a near-global data set of the atmospheric trace gas carbon tetra chloride (CCl4) from the MIPAS satellite instrument as obtained between 2002 and 2012. I consider the manuscript to be publishable in ACP after the points outlined below have been addressed, in particular the ones regarding the amount of quantitative information and the lifetime estimates. In addition I urge the authors to reconsider the excessive use of abbreviations which is limiting readability.

p1 l3. The recent SPARC report with that name should be credited here. Given that it was a very recent and international effort on CCl4 I find that report has been cited and used very little throughout the manuscript.

We agree with the reviewer and we have added more references to the recent SPARC report throughout the paper. At the same time we think that the abstract of a paper must be a stand-alone, so we preferred not to add the citation directly in the abstract.

p1 l12. This statement and evidence for it is nowhere to be found in the manuscript.

In the discussion of Fig. 6, we attributed the North Hemisphere – South Hemisphere (NH-SH) differences at middle latitudes to larger emissions in the NH, however the evidence is not directly related to the results of this paper. For this reason the sentence "In the troposphere, the largest values are observed at latitudes of major industrial countries (20°/50°N)." has been removed.

p1 l12-14. I disagree. This good agreement only proves that the remote sounders are producing similar results, but it is not a validation.

We fully agree with the reviewer, we also decided to modify the title of the paper from "CCl4 distribution derived from MIPAS ESA V7 data: validation, trend and lifetime estimation" to "CCl4 distribution derived from MIPAS ESA V7 data: inter-comparisons,

trend and lifetime estimation"

The sentence has been rephrased. "The good agreement we find between MIPAS CCl4 and independent measurements from other satellite and balloon-borne remote sounders proves the reliability of the MIPAS dataset." → "MIPAS CCl4 measurements have been compared with independent measurements from other satellite and balloon-borne remote sounders showing a good agreement between the different datasets."

p1 l15-20. I would strongly recommend some more quantitative information in this section. What are the actual trends, the lowest altitudes sounded by MIPAS, and the comparability of the mixing ratios and trends, including uncertainties? Also, how do the authors explain the positive trend in the Southern mid latitudes?

In the revised paper we tried to include additional numbers in the abstract, even if it is not always possible to summarize with a few numbers the information contained in the maps. Throughout the paper we report plots/maps that quantify with great details the variability of the results as a function of latitude and / or height. One of the key points of this work is to exploit MIPAS measurement capabilities to highlight the variability of trends as a function of latitude and pressure / altitude. In many cases, due to complexity of the studied phenomenon, the results can't be summarized in a few numbers. Plots and maps represent a more comprehensive picture of the studied processes. As far as numbers are concerned, as explained in the "Data availability" Section of the paper, these are freely available upon request to the authors.

About the positive trend in the Southern mid-latitudes and its possible explanation we improved the discussion in Sect. 5.2 by adding some comments and references to recent works suggested by another reviewer.

p4 l20-25. Most of that section should be moved to the caption of the figure. In fact most figure captions in the manuscript need more explanation of what is shown.

Done. The new caption of Fig. 1 is: "Typical Averaging Kernels (AKs, coloured solid lines) and vertical resolution (red dotted lines) of CCl4 VMR retrieved from Full Resolution (FR, top) and Optimized Resolution (OR, bottom) MIPAS measurements. The vertical resolution is calculated as the FWHM of the AK rows. The plot's key shows also the average number of degrees of freedom (DoF) of the retrieval (trace of the AK matrix) and the number of retrieval grid points (Npt)."

p8 l 11 & 14. There are still quite a few minor English language problems in this manuscript, two examples here are "CCl4-poor" and "in the South Pole".

The manuscript has been carefully proof read. We hope that the revised paper we are submitting to ACP is further improved.

p8 l11. If there is a seasonal effect it is not obvious from figure 4. Can the authors quantify this seasonality, also to prove that it is indeed statistically significant? A similarly quantitative approach would help in other parts of the manuscript too, e.g. the earlier statements on latitudinal and altitudinal gradients.

Sect. 3 has been modified. In particular we moved the comments on the seasonal variability to the description of Fig. 5. The seasonal variability of CCl4 distribution probably is not obvious from Fig. 4, however it is evident from Fig. 5.

p9 figure 4 caption. "May 20117"

Done. "May 20117" → "May 2011"

p11 l9-11. This is not correct. Numerous aircraft and balloon campaigns have measured CCl4 with alternative in situ techniques. Please see e.g. Volk et al., 1997 and the many papers that cite it, as well as the FTIR total column measurements from the Jungfraujoch station.

The sentence has been rephrased. The two instruments used in the paper for inter-comparison purpose are not the only ones available.

p16 l4-6.This is exactly where alternative validation methods could help.

We agree with the reviewer. In the revised paper we highlight that we do not pretend to carry-out a comprehensive validation work, we limit the intercomparison to MIPAS-balloon and ACE-FTS measurements.

p23 l10. A "kind of global CCl4 trend"?

Corrected. "A kind of" → "the"

p24 l6. The smaller trend error does not take into account the biases, though.

This is correct. The MIPAS finer sampling (with respect to ACE-FTS) permits to estimate trends with a smaller random error, i.e. with a better precision. The sentence has been rephrased. “With MIPAS it is therefore possible to achieve a smaller trend error.” → “With MIPAS it is therefore possible to estimate trends with a better precision”.

p24 section 6. This section needs some additional work. The methodology (equation 2) is not used correctly as Plumb and Ko (1992) clearly state that a) it should only be applied to two species in steady state and b) the slope needs to be determined exactly at the tropopause. Moreover the method was improved by Volk et al.,1997 and Brown et al., 2013 to e.g. correct for tropospheric trends and derive steady-state lifetimes. A second problem with the lifetime estimate presented here is that it is highly dependent on uncertainties and potential biases of the trace gases involved, i.e. CCl4, CFC-11 and CFC-12. Can the authors present evidence that these uncertainties and biases have been taken into account for the determination of the lifetime and its uncertainties?

Sect. 6 was re-written. CCl4 lifetime is now estimated using the method proposed by Volk et al. 1997 and Brown et al. 2013 that accounts also for the actual trend of the considered tracers. Since the actual trends of CCl4 and CFC-11 are rather small we get an estimate very similar to that presented in the discussion paper. To better characterize the uncertainty of our CCl4 lifetime estimate, we now include additional details on error calculation and also the results of some sensitivity tests we carried-out to evaluate the impact of some additional error components.