

Interactive comment on “CCl₄ distribution derived from MIPAS ESA V7 data: validation, trend and lifetime estimation” by Massimo Valeri et al.

Anonymous Referee #1

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GENERAL COMMENTS

The paper describes the CCl₄ VMRs as derived from the MIPAS instrument using the ESA V7 data set. This data set is validated against independent measurements and used to determine trends and lifetime of this trace gas, which are consistent with other recent estimates.

The paper is very well written and its scope fits well into AMT. However, there are some questions that should be clarified before publication.

SPECIFIC COMMENTS

page 9, Figure 4:

The lowermost values at several latitude bands exhibit drastically increased VMRs

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(compared to values above and beside). Are these values typical for deep tropospheric VMRs or could, e.g., (undetected) thin clouds or stray light have affected the measurements? Would filtering these extreme values affect the trend analysis in a positive or negative way?

page 12, line 21ff:

It is not fully clear what the discussed quantities of Fig. 6 and 7 are. I assume that the blue curves are simply the sum of the errors of the two individual instruments? Or was the precision as a random error summed in the square? This is rather elaborately described for the ACE-FTS instrument following this section but missing here. Further I do not fully understand the distinction between the standard deviation "sd" of the differences and the error bars on the mean. How was the standard deviation of the mean computed? By dividing the standard deviation of the differences by the square root of measurements? Or was a jackknife-like algorithm employed? Further, was the standard deviation of the differences computed with an assumed mean of zero? Otherwise, shouldn't those standard deviations be plotted relative to the mean instead of the zero line?

page 23, Table 3:

What are the pressure levels chosen for the MIPAS data? At -45 degree latitude, the significance of the data is reduced at 200 hPa and below. I am not sure that I can identify the box with a trend of 25 pptv and an error of only 5 pptv between -40 and -45. The values are difficult to determine using the continuous colour scale, but the lowest box in this grid seems to have a value of -15±5.

MINOR REMARKS

page 8, line 6:

Space after "Sect." is missing.

page 12, line 21ff:

How much of the difference can be attributed to the different level 2 algorithms (e.g.

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employed micro windows and spectral databases)?

page 17, line 17:

What is the reasoning behind the specific value of 1.6? Obviously one is looking for a grid point being "always" in the troposphere with a sufficient distance from the stratosphere as to not be influenced by its value (more than 1.5km distance?) but as high as possible as the significance drops with altitude. I would expect that for many latitude bands no significant value would be available.

page 17, line 28f:

What is the specific reasoning for including this specific set of oscillation periods and how significant are the determined factors c_i and d_i ?

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-1163, 2017.