

Interactive comment on “Carbon monoxide observations from ground stations in France and Europe and long trends in the free troposphere” by A. Chevalier et al.

A. Chevalier et al.

Received and published: 10 February 2009

We thank Owen Cooper for serving as editor of our paper. We also especially appreciate his effort to provide his own review, that was an additional and significant help to improve the manuscript.

Point-by-point answers to Owen Cooper's general and specific comments are given below. Our replies to each Anonymous Referee are provided in separate documents.

General comments

In his comments, as well as in those from both Anonymous Referees, we identified three major points of criticism:

1. on our interpretations invoking the OH-CO-CH₄ chemical system, that were given here and there in the paper to comment the CO variability revealed in the figures. Those interpretations were found (by Referee 2 in particular) to be inaccurate, and even at some places, in error.
2. on our discussion on the role of anthropogenic emissions in the CO budget at regional and hemispheric scale. The discussion was found to be too speculative, all the more that some conclusions were contradictory to previous studies with better scientific support (in particular pointing biomass burning as the main cause of interannual variability at hemispheric scale for CO).
3. on our conclusion to a negative CO long term trend at Pic du Midi (PDM) from only three data points (yearly means in 1982, 1983 and 2005).

In light of all comments, it turns out that the dataset presented in our paper allows to discuss the ability of the different data sources to monitor the variability of tropospheric CO from seasonal to decennial time scales, but not to investigate the causes of that variability (major points 1 and 2 above). While revising the manuscript, we therefore followed most suggestions of Referee 2 to eliminate the weakest interpretations and conclusions. In particular, the whole Section 4.2 in the ACPD paper (role of anthropogenic emissions) has been removed (as well as associated Figures 13 and 14). Some discussion points based on the literature have however been kept, but moved to Section 1.

Regarding major point 3, we agree that no definitive conclusion, but nevertheless some evidence, of a negative long term trend at PDM can be driven from our estimation (as acknowledged by Referee 2). Therefore we have rephrased our conclusions in a more prudent fashion. To give further support to this conclusion, we have followed Owen Cooper's suggestion and included more recent data (year 2006 and 2008) from PDM in the analysis. The yearly means for 2005, 2006 and 2008 (117.0, 117.2 and 114.8 ppbv, respectively) are quite close to each other. Even if it is still not a definitive argument,

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)

it gives more credit to the hypothesis of a negative trend with respect to interannual variability, as explanation for higher CO levels in the years 1982-83 than in 2005-08.

Concerning the quality of the English, none among the coauthors of this paper is English native speaker. It is also not possible to find such a person for the time-consuming task of checking and rewriting. Consequently we let at the Editor's appreciation whether we eventually have to follow the requirement of Referee 1. Anyway we have done our best to improve by ourselves the English and the clarity of the revised manuscript. If the result is still unsatisfactory, specific suggestions would help us.

Specific comments

The title has been changed as suggested.

The abstract has been entirely rewritten.

"ppbv" is now used throughout the text.

Introduction, page 3315, line 7: this has been turned to "O3 production at local scale".

Page 3320, line 24: The text in section 2.2 has been modified as suggested.

Page 3324, line 2: The text has been changed as suggested.

Comment on altitude thresholds: As recommended, a footnote has been added where an altitude threshold (concerning the representativity of CO measurements from ground stations) is mentioned for the first time. A table has been added in the conclusions to summarize our findings.

Comments on Section 4.1 and Figure 10: The trend analyses at ZSP and PDM have been significantly reworked. As consequence, Figure 10 has been replaced by a new one (Figure 9) and almost all the text of Section 4 has been rewritten (see items 15a-i in our detailed reply to Referee 2). As suggested by Owen Cooper, recent data at PDM (2006 and 2008) have been included in our analysis.

[Full Screen / Esc](#)

[Printer-friendly Version](#)

[Interactive Discussion](#)

[Discussion Paper](#)



Page 3329, line 15: A value of -0.7 ppbv/yr is now mentioned in the text.

Figure 9: The labels have been corrected (Figure 8 in the revised manuscript).

Figure 13: This figure has been removed, together with Section 4.2 (see above).

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 3313, 2008.

ACPD

8, S11068–S11071, 2009

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

S11071

