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Atmospheric Chemistry and Physics Discussions

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.

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We thank the anonymous Referee #1 for his helpful comments on our paper. Below, we indicate point by point how we changed the manuscript consequently.

The English writing has been proofread and made as clear and concise as possible by ourselves. However it was not possible to make it checked by a native speaker.

As the conclusions of the paper have significantly changed, the Abstract has been completely rewritten.

Page 3320, line 20: This has been corrected in the text.

Section 2.2: MOZAIC data over Paris exist but the time coverage was too sparse for

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our study. A short comment has been added in the revised text (see also the related item in our reply to Referee 2).

Page 3322, line 20: The qualitative character of the comparison of MOPITT vs. station data has been further stressed in the text.

Page 3324, line 27-30: All the discussion on the CO budget and its seasonality has been rewritten and, we hope, clarified.

Page 3325, line 1-4: A reference to Granier et al., 2000, has been added.

Page 3325, line 4ff: The discussion on CO interannual variability and its causes has been almost entirely rewritten (see the revised text and our reply to Referee 2, item 10). In particular, the possible role of year-to-year changing weather conditions is discussed with respect to biomass burning.

Page 3326, line 2ff: The surface data from the lowest stations are actually difficult to interpret. A short comment has been added in the text.

Section 4: The site Zugspitze (ZSP) was chosen for the trend analysis since it is the most comparable to Pic du Midi (PDM) in terms of altitude and location with respect to the mountain chain (northern edge). Hohenpeissenberg is a quite lower site, likely much more exposed to local emissions. Therefore a trend analysis at this site would not be directly comparable. A trend analysis at Jungfraujoch is proposed in a paper by Zellweger et al., newly published in ACPD (vol. 9, pp. 2381-2415, 2009).

Page 3328, line 14 and Figure 10: The trend analysis has been completely revised and rewritten. In particular, it is now shown that interannual variability is unlikely (probability below 13%) to explain the difference in CO levels at PDM between 1982-83 and 2005-08. The conclusions have been modified as suggested here by Referee 1, but also by Referee 2 as well as the Editor Owen Cooper.

Page 3329, line 19ff: We thank the Referee for this very interesting suggestion. Unfortunately, as explained in our reply to Referee 2 (item 15c), it turned out that the finding

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of contrasting trends in summer and winter was not solid. Therefore, the related material has been removed from the revised manuscript.

Page 3329, line 26ff and Figure 12: This has not been checked for MOPITT. Anyway, as explained above, the question of trends separated by season is no longer investigated in the paper.

The two items pointing pages 3330 and 3331 (section 4.2 of the discussion paper) concerned a discussion that does not longer appear in the revised manuscript.

Figures 3, 4, 5, 7, 9 10 and 11: Larger fonts have been used where needed (now Fig. 2, 3, 4, 6, 7, 8, 9 and 11 in the revised manuscript).

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