Interactive comment on “First carbon dioxide atmospheric vertical profiles retrieved from space observation using ACE-FTS solar occultation instrument” by P. Y. Foucher et al.

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Dear referee,

Thanks for your helpful and constructive comments.

General comments:

1- The title has been modified and now reads: “First carbon dioxide atmospheric vertical profiles from 5 to 25 km altitude retrieved from space observation using ACE-FTS solar occultation instrument.”

2- Errors are mentioned in the text but not on all figures not to make them too confusing (see below, item 9).

3- Most of the figures have been clarified and modified

Specific comments:


2- 26479 line 4: the criterion of a lowest tangent altitude < 12 km is mainly to avoid cloudy occultations (we do not clearly see what the reviewer means by “sunset bias”)

3- 26482 line 7: such a figure could focus the reader on it when the text is more important, for example the fact that the standard deviations include the natural CO2 variability. Error bars are shown in the figures of the Appendix.

4- 26483 line 18: we thought it was not worth doing so due to the quite different space-time resolutions of the two systems. Results of such a comparison must be considered as a gross estimation of the accuracy reachable by ACE.


6- Fig 2: top: the numbers “3”, “6”, etc replaced by “March”, “June”, etc. bottom: legend clarified.

7- Fig 5: CARIBIC latitude range added in figure 5.

8- Fig 6: The fit results from a nonlinear iterative Levenberg-Marquard method. The reviewers comments may apply to the 16-18 km fit for which data are somewhat noisier. Mention of the algorithm used has been added in the text.

9- Fig 7-10: these figures have initially been produced with error bars. They appeared quite confusing and difficult to look at. This is the reason why we have introduced the text p26482 lines 7-20. See also item 3 above.

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Technical comments
1- P 264821 line 2 : yes; done
2- 26481 line 11 : done
3- done
4- done
5- Sentence changed to: “In this paper we have presented, for the first time in the altitude range 5-25 km, five years of monthly mean CO2 vertical profiles from the ACE-FTS limb-viewing space-borne instrument (Bernath et al., 2005).”

Best regards,
Pierre-Yves Foucher

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 26473, 2010.