

## ***Interactive comment on* “Technical Note: Feasibility of CO<sub>2</sub> profile retrieval from limb viewing solar occultation made by the ACE-FTS instrument” by P. Y. Foucher et al.**

### **Anonymous Referee #2**

Received and published: 26 February 2009

The authors present a feasibility study on the retrieval of CO<sub>2</sub> profiles based on spectra simulated for the ACE-FTS instrument. The article is generally well written, clearly structured and also the figures are of good quality.

For the resubmission, there are two main points that should be considered:

a) Unfortunately the retrieval is performed for synthetic spectra only. Since the authors write that they also worked with actual ACE observations, I strongly recommend to add retrievals from measured spectra, if possible. These would be much more convincing that CO<sub>2</sub> profiles can be obtained from ACE than applying the retrieval on simulated data.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



b) In agreement with the first reviewer, I am wondering if ACP is the best choice of journal for this article. Since the article does not provide new insights into atmospheric chemistry or physics, but a valuable advancement in possible retrieval techniques, AMT seems to be most appropriate. Depending on the decision of the editor, the authors might consider to submit this article to AMT.

### Specific Points

#### Abstract

Line 7-10 : I find this sentence very misleading, since your study is carried out not for the actual occultation measurements of ACE, but for simulated spectra. I recommend to rephrase this.

#### Introduction

This part could be improved by reducing the extended summary on the atmospheric chemistry of CO<sub>2</sub>. This would be reasonable if the article provided new information on these. Since the article does not contain any new results on CO<sub>2</sub> profiles retrieved from actual observations, the relation to carbon fluxes, or the Brewer Dobson circulation is rather weak.

P415, line 24 : better : results for synthetic spectra

#### Chapter 2

Considering that the retrieval is applied on synthetic spectra I find the headline for this chapter already quite misleading. But to avoid misunderstandings the term "synthetic" or "simulated spectra" should for sure be added to the headlines for chapter 3 and 4.

P417, line 8 : Since the method to obtain pointing information from the N<sub>2</sub> continuum is also applied for simulated spectra only, I recommend to skip this statement.

#### Chapter 3

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



Figs. 1 to 3 : The information that these figures show results from a RTM (i.e. 4A/OP-limb ) needs to be included.

P420 line 12 : Please define "true" and "geometric" tangent height

In agreement with the first reviewer I think the article would improve by reducing the description of the optimization of the micro windows.

Chapter 4

P429 line 26: write vector (or profile) instead of "matrix"

Chapter 5

P431 line 10 : Around 12 km, the error for the retrieved tangent height is 30 m (not 20 m)

P431 line 11 : For 14 km the standard deviation is approx. 100 m (not 80 m)

P432 line 10 : "the maximum absolute difference to the true profile is less than 1 ppm" : for 12 km the difference is at least 1ppm.

P432, line 21: For 13 km the difference is clearly above 2 ppm.

Chapter 6

P433, line 10 : "In this paper we have shown that ... measurements of the ACE-FTS instrument ... are able to provide CO2 vertical profiles in the 5-25 km altitude range."

If there are such results for the ACE measurements then they should be included in the article. From the studies presented in the paper, it is certainly not possible to draw this conclusion.

Technical Points

P422 line 1: "The impact of species is confirmed ..." please rephrase

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

Interactive  
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

