

***Interactive comment on “Comparisons between  
SCIAMACHY atmospheric CO<sub>2</sub> retrieved using  
(FSI) WFM-DOAS to ground based FTIR data and  
the TM3 chemistry transport model” by  
M. P. Barkley et al.***

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Received and published: 14 August 2006

The paper by Barkley et al. provides a nice and extensive work on SCIAMACHY CO<sub>2</sub>. It is well written and organised and shows some encouraging results while the authors are still careful in their interpretation and do not forget that requirements for inverse modeling are not yet met. I therefore recommend publication (after consideration of some minor points) of this nice and well balanced paper in ACP.

Comments: Page 5399, line 5: I do not see a good (definitely not excellent!) agreement

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between TM3 and FTIR. Actually, I am somewhat disappointed of the rather bad quality of the FTIR data in Fig. 2, especially the large scatter (or outliers?!) in September seems weird. In Fig. 2 I would like to see the 3rd order polynomial fitted to the FTIR data (in the same plot!). Just looking at the raw FTIR data, it looks to me as if you could fit everything through it which would render a FTIR-SCIA comparison rather useless.

Page 5401, line 13: Do you have any idea where the CO<sub>2</sub> enhancement (if not an enhancement in the light path) comes from?

In General: I would be more careful when saying that there is excellent agreement. Considering seasonally varying biases: Did you exclude mountaineous areas in the analysis? My point is that if the standard deviation of the surface elevation within the ground scene is large (ie, above 100m), then different parts of the scene will be measured in different seasons as snow is rather black and if there is snow at higher altitudes, only valleys would be measured. Thus, the computed mean elevation of a ground pixel would be different from what SCIA actually measures. This could induce seasonally changing biases, in the same way as aerosols could. It would be nice if the authors could discuss briefly some possible reasons for biases.

One last remark about the review system at ACP as this is also a discussion forum: The second reviewer mentioned that his review is unbiased as he didn't read the previous one. I think he raised a crucial point especially for young researchers like me. Although I think to be not influenced, one somehow always is even if one doesn't admit it to him/herself. However, I also like the open system but it would be better to publish the reviews and comments all at one point in time to avoid biased reviews (as far as I have seen it, a real discussion involving more people that the reviewers and the authors is not happening anyway).

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Interactive comment on Atmos. Chem. Phys. Discuss., 6, 5387, 2006.

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