

## ***Interactive comment on “Carbon monoxide, methane and carbon dioxide columns retrieved from SCIAMACHY by WFM-DOAS: year 2003 initial data set” by M. Buchwitz et al.***

**M. Buchwitz et al.**

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Authors answer to the interactive comment of referee C. Frankenberg on paper Buchwitz et al., Carbon monoxide, methane, and carbon dioxide columns retrieved from SCIAMACHY by WFM-DOAS: Year 2003 initial data set, Atmos. Chem. Phys. Discuss., 5, 1943–1971, 2005

Answers to "General comments":

First of all we would like to thank the referee for the constructive comments on our

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paper. Each comment will be carefully considered for the revised version of the paper. Below we give answers to each of the comments made by the referee.

In the revised version of the paper we will give more evidence for the detection of CO<sub>2</sub> uptake/release by the biosphere with SCIAMACHY. We will do this by providing a more detailed quantitative comparison with TM3 on hemispheric and on regional scales demonstrating a significant correlation between the two data sets and showing that, for example, significant influence from solar zenith angle dependent errors can be ruled out.

Answers to "Specific comments":

Abstract:

CO<sub>2</sub> uptake statement: Will be considered, see above.

page 1946:

The paper will be cited (also at various other places).

page 1947:

Spatial resolution: Will be considered.

page 1949:

The paper will be cited.

page 1951:

Will be changed from "good" to "reasonable" and also more details will be added.

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The scaling factor issue will be better addressed.

page 1952:

Will be changed from 1% to a few percent.

page 1954:

The paper will be cited.

page 1955:

In the revised version of the paper we will add more details concerning the normalization by  $O_2$ . For example, we will investigate the impact of normalizing by model surface pressure compared to normalizing by observed  $O_2$ . We will also discuss in more detail the findings concerning the larger observed  $XCO_2$  variability compared to the lower model  $XCO_2$  variability.

Section 7:

The variability issue will be discussed in more detail in the revised version of the paper (see previous comment) including the scaling factor issue. Thanks for the HITRAN comment!

In the revised version of the paper we will give more evidence for the detection of  $CO_2$  uptake/release by the biosphere with SCIAMACHY. A more detailed quantitative comparison with TM3 on hemispheric and on regional scales will be provided demonstrating a significant correlation between the two data sets. We will show that, for example, significant influence from solar zenith angle dependent errors can be ruled

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out.

We cannot be 100% sure that the low CO<sub>2</sub> over Africa is free of any influence of clouds. However, we have done some investigations to determine a possible influence but did not find a significant influence: In Buchwitz et al., Atmospheric methane and carbon dioxide from SCIAMACHY satellite data: Initial comparison with chemistry and transport models, Atmos. Chem. Phys., 5, 941-962, 2005, it is shown that the observed pattern of a regionally low CO<sub>2</sub> situation over Africa remains present when using a stricter and stricter threshold for the cloud identification.

page 1959:

The 30% value is from: Buchwitz et al., Global carbon monoxide as retrieved from SCIAMACHY by WFM-DOAS, Atmos. Chem. Phys., 4, 1945-1960, 2004. The reference to this paper will be added.

page 1960:

We will add that the columns are scaled and will demonstrate that we obtain a significant correlation.

Answers to "Technical corrections":

They will be considered. Thanks!

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Interactive comment on Atmos. Chem. Phys. Discuss., 5, 1943, 2005.

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