

## ***Interactive comment on “Atmospheric greenhouse gases retrieved from SCIAMACHY: comparison to ground-based FTS measurements and model results” by O. Schneising et al.***

### **Anonymous Referee #1**

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Comments on "Atmospheric greenhouse gases retrieved from SCIAMACHY: comparison to ground-based FTS measurements and model results" by O. Schneising et al.

General Comments This paper presents a very careful validation of the satellite-borne SCIAMACHY instrument using observations and analyses from surface-based systems and models. The SCIAMACHY results for total column CO<sub>2</sub> and CH<sub>4</sub> are compared with surface-based observations by Fourier transform spectrometers, with an assimilation of surface and tower in situ observations and with 4-dimensional models. The authors have been careful in their treatment and analysis of the comparisons and in their identification of uncertainty. They have established the usefulness of global

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SCIAMACHY measurements for studies of these two important greenhouse gases. The paper is well written, clear and concise.

Specific Comments The following comments are intended to clarify the presentation:

Page 28715 Abstract The abstract may be read without benefit of the full text and should be as self-contained as possible. Thus: Line 12 CarbonTracker should be defined or referenced at its first occurrence Lines 22,23 Terms like "regional relative precision" and "relative accuracy", which seem to have been created by the authors later in the manuscript will not be recognized by readers of the abstract. Line 26 Is it true that SCIAMACHY CH<sub>4</sub> accuracy is determined by comparing observations to a computer model simulation?

Page 28717 Line 6 "near- infrared/ shortwave-infrared" these terms are not well defined and can change with the user. It would be clearer to include numbers defining the spectral regions.

Page 28718 Line 2 Include a reference for CarbonTracker

Page 28719 Line 28 "In November 2005, the impact of solar protons..." Was this a temporary condition or did this event result in a permanent change to SCIAMACHY?

Page 28720 Line 8 Define near-infrared. Line 10 "proving" = "providing"

Page 28723 Line 8 The xCH<sub>4</sub> averaging kernels range between .5 and 1.3, is this close enough to 1 to be ignored? Line 12 At the end of this section it would help the reader understand the magnitude of this adjustment to include a statement such as " A typical adjustment of the satellite column is xx% for xCO<sub>2</sub> and yy% for xCH<sub>4</sub>."

Page 28725 Line 19 "is only few" = "are limited"

Page 28729 Line 12 "proceeding" = "previous"

My only concern with the paper is the impression that when some feature of the data arises, that might tend to diminish the intercomparison, that data is excluded from the

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analysis, such as: Page 28719, Line 14 Page 28723, Line 11 Page 28724, Line 27  
Page 28725, Line 27 Page 28726, Line 17

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Interactive comment on Atmos. Chem. Phys. Discuss., 11, 28713, 2011.

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