

Interactive comment on “Validation of five years (2003–2007) of SCIAMACHY CO total column measurements using ground-based spectrometer observations” by A. T. J. de Laat et al.

Anonymous Referee #1

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General comments

This paper presents a validation of CO total column measurements using twenty ground-based spectrometer over the globe. Even if the number of stations is relatively low, the authors show a discussed comparison between the different set of data (mainly according the location for the ground-based spectrometer). The paper is clearly written and I found the conclusion honest showing the limits of the comparison. This paper is certainly interesting for the SCIAMACHY CO users and for this reason I find this paper suitable for AMT since the authors presents well the method of the data validation.

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However before publication I recommend the authors to answer the following questions in the paper :

1. In the paper, there is a reference on the very weak impact of SCIAMACHY CO averaging kernels, but I didn't see any comments about the impact of the averaging kernels (AK) of the ground-based spectrometer CO measurements. I think the authors should put some arguments about the impact of the AKs on the comparison with SCIAMACHY.
2. The authors use the TM4 model for estimating the columns below the clouds when necessary to calculate the SCIAMACHY CO column. Somehow, the authors should add some information, such as, for example, the percentage of model column in the total column, or other statistics (percentage of pixels contaminated by the model, etc.).
3. The authors show a SCIAMACHY CO bias which is significant for 2003 and 2004 (fig 5e), but I didn't see any explanations or suggestions on this bias. Is a retrieval discrepancy or an anomalous CO year difficult to measure by SCIAMACHY since SCIAMACHY is measuring in the NIR and more sensitive to the surface?. I'd like to have at least some suggestions about this difference.
4. This paper is a validation of five years of SCIAMACHY CO and there is no use of CO profiles (mainly aircraft). The authors could argue why they only use GBS measurements in the text.

Comments and typos:

-Define in the abstract the different acronyms used and more generally for the figure caption too.

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p 2895, l 3 space missing.

p 2918, Table 2: For the reader it will be useful to have in the table some indication about the situation of the station (for example remote, mountain, Ocean, ..)

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