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Interactive comment on "SCIAMACHY CO over the oceans: 2003–2007 interannual variability" *by* A. M. S. Gloudemans et al.

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We would like to thank the referee for his/her useful comments on our paper. The general, specific, and minor comments are addressed below and the corresponding changes have been marked in boldface in the revised version of the manuscript.

General and Specific Comments:

1. A sentence has been added at the beginning of Sect. 2.3 stating the essence of the statistical analysis performed by de Laat et al. (2007).

2. We believe that an assessment of the data differences between SCIAMACHY/SRON

and SCIAMACHY/Bremen is a separate topic for which an in depth comparison between the two data sets is required before any statement can be made and thus is beyond the scope of this paper. An assessment of the quality of SCIAMACY/SRON versus SCIAMACHY/Bremen for the purpose of data assimilation should further come from the data assimilation community.

3. We have changed the title into: SCIAMACHY CO over land and oceans....

4. In principle all single SCIAMACHY CO measurements that satisfy the selection criteria presented in Sect. 3.2 can be used for inverse modelling and/or data assimilation as long as the instrument-noise error is taken into account. On average 1,200,000 CO measurements per year satisfy these selection criteria (land and ocean measurements). This has been added to the paper in Sect. 3.2, since that section deals with single measurements rather than averages as in Sect. 3.3. In our analyses so far we have averaged the data to improve the measurement precision such that unambiguous interpretation of the data was possible. For this, we have averaged the single measurements that satisfy the selection criteria. Depending on the application averaging of the data can be done in either time or space, taking into account the instrument-noise error when averaging the data (cf. section 4 for examples of averages in time and space). Because of seasonal variations in solar zenith angle, surface albedo, and daily variations in cloud cover it is difficult to give a typical number of observations per day or per month. In addition, the number of useful measurements varies strongly with geolocation. See for example figure 6 in De Laat et al. (J. Geophys. Res., 112, D12310, doi:10.1029/2006JD008256, 2007). We have created a similar figure for the retrieval version used in this paper, including the measurements over the ocean and added this to figure 7 as an extra panel.

Minor comments:

1. This has been changed throughout the paper.

2. We have deleted this sentence and added 'and interannual variability' to the previous sentence.

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