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Interactive comment on "Validation of ENVISAT/SCIAMACHY columnar CO by FTIR profile retrievals at the Ground-Truthing Station Zugspitze" *by* R. Sussmann and M. Buchwitz

Anonymous Referee #1

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Validation of ENVISAT/SCHIAMACHY columnar CO by FTIR profile retrievals

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General comments The paper is well written, clear, and concise.

The paper addresses satellite validation of CO which is a very important species from atmospheric point view.

The use of ground based high resolution FTIR for comparing measured CO columns is sound, since this technique is well proven for CO and has good averaging kernels all

the way to the ground.

The main drawback is the limited data set from Sciamachy and more discussion is needed about the validation methodology and about the quality of Schiamachy data.

Specific comments

1. As mentioned above the main drawback is the limited data set of Schiamachy. In light of this I believe it is important to include a discussion what is known about the quality of the Schimachy data from other sources instead referring to other papers. For instance the fact that the detectors of Schiamachy had some condensation problems and had to be heated periodically should be mentioned and what kind of data is included in the Schiamachy data set. This applies not only for CO but also O2, since this species is used in the validation.

2. In the comparison of the seasonal variation one single slope between March to Sep 2003 is compared, instead of comparing 3rd order polynomials, as used in Fig 1 for the FTIR data, why ?

3. In order to be able to get any significant slope in the Schiamachy data the amount of data points have to be augmented by increasing the radius for comparison up to 2000 km. The authors claim this is correct since it improved the scatter in the slope. For an absolute comparison this would certainly be problematic since the Zugspitze, from where the authors have conducted their column measurements, is situated above the mixing layer while Schimachy with a radius of 2000 km will pick up a lot of low polluted areas, such as the Po valley and Ruhr district. The authors are however studying the relative variability of CO (relative to pressure variations) and most of the seasonal variation will be the variation in the OH sink. However, it s not clear to men that part of the seasonal variation seen by Scimachy will also include the seasonal variation in combustion. The authors argue that a recent study by Yurganov, utilising solar FTIR measurements at many NDSC stations, is not showing a significant difference in the seasonal variation, but to my knowledge, very few or none of these stations are mea-

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suring in polluted areas.

4. The concept of using pressure normalized values for the FTIR and O2 normalized values for Schiamachy is interesting, since under the assumption that the profiles of the two species are similar, as pointed out by the authors, it will eliminate altitude variations of the measurements. On the other hand since the comparison is only relative to the mean value I have a problem to understand what it achieves in this case.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 557, 2005.