Atmos. Chem. Phys. Discuss., 5, S449–S450, 2005
www.atmos-chem-phys.org/acpd/5/S449/
European Geosciences Union

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Intercomparison of O_3 profiles observed by SCIAMACHY, ground based microwave and FTIR instruments" *by* M. Palm et al.

Anonymous Referee #1

Received and published: 14 April 2005

This paper is a valuable demonstration of comparisons of mutiple instruments to a satellite sensor, using a rigorous formulation which has only recently been published. It is also an important step in evaluation of SCIAMACHY.

However, I have one major comment, which may delay publication.

Namely,I find the results of the FTIR comparison very hard to accept(see Fig 8-10). Figure 8 in particular looks wrong. The convolution of the SCIAMACHY profile with the FTIR averaging kernels should produce a result which is overall intermediate between the SCIA profile and its a priori. This is indeed the case for the two microwave comparisons (Fig 2 and 5). However in Fig. 8, the difference between the simulated and

a priori profiles has the opposite sign to the SCIA - a priori difference at all altitudes, except between about 21-25 km. I don't think this can be correct. Secondly, in Fig 9, the large discrepancy between the expect and actual mean differences either means the retrieval errors are unrealistic, the true profiles being sampled by SCIA and the FTIR are very different, or an error has been made.

I feel that before publication these results should be either corrected if necessary, or convincingly explained if they are right, or the FTIR comparisons should be removed altogether.

A minor comment: Section 3.2. Some insight into why the expected error of the simulation is less than the straight comparison would be very helpful. Also, the asymmetry between instruments 1 and 2 should be explained. Why simulate SCIA with the ground-based averaging kernels? Why not the other way around?

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 911, 2005.