**Atmospheric
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Discussions**

Interactive comment on "Comparison and synergy of stratospheric ozone measurements by satellite limb sounders and the ground-based microwave radiometer SOMORA" *by* K. Hocke et al.

K. Hocke et al.

Received and published: 3 May 2007

Dear Referee 1,

We thank you for your constructive comments. You provided us 5 action items, and here is our response:

1. The period October-December 2005 for inter-comparison of the radiometers at Mauna Loa and Payerne is not optimal as you noted. Now, we perform the inter-comparison for the time interval from August 1, 2004 to December 31, 2004. The (Aura/MLS - Mauna Loa) difference profile of 2004 is almost the same as for 2005. The (Aura/MLS - SOMORA) difference profile changes at h=25-30 km (the difference is equal to +5% at h=25 km for the 2004 data). In the revised version of the article, we

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will exchange Figure 18 by the new figure based on the 2004 data of Mauna Loa and SOMORA.

2. This is a good point. The SOMORA data of the time before March 31, 2005 are better for the inter-comparison of Aura/MLS with MIPAS in Figure 17. If we limit the SOMORA data to the time until March 2005, the positive bias (MIPAS-MLS)/MLS is only +6 % at h=25 km. We will exchange Figure 17 by the new figure.

3. We will emphasize that the assumption of long-term stability has been utilized in equation 5.

4. Your second assumption is exactly what we did (a single profile for all locations ...). We have a set of profile pairs (SOMORA, MLS) fulfilling the coincidence criteria (d $<$ 800 km, dt $<$ 1h).

$<$SOMORA$>$= average of the SOMORA profiles taken from the set of profile pairs. This yields a single mean ozone profile. We can add the mean ozone value to the differences of the profile pairs (MLS-SOMORA) (lat,lon) at a given altitude. This gives us irregularly distributed estimates of O3(lat,lon) at a certain height. Finally, all O3(lat,lon) values are interpolated to an equally spaced grid (right-hand side of Figure 19). We will further work on this explanation and include it in the revised version. There are two advantages of combination of ground and satellite data: 1) the map is not only derived from the profiles along the satellite orbit but also by the ground station profile in the middle of the map, 2) differencing MLS-SOMORA removes to some extent temporal fluctuations of ozone (those with large spatial scales).

5. Your corrections of the figure numbers are correct.

Thank you again for your comments for improving our article!

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 5053, 2007.

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