

## ***Interactive comment on “Geophysical validation of temperature retrieved by the ESA processor from MIPAS/ENVISAT atmospheric limb-emission measurements” by M. Ridolfi et al.***

**M. Ridolfi et al.**

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We thank the reviewer #1 for careful reading of the manuscript and for the useful comments. We include hereafter our replies to both the general and the specific comments of the reviewer (Atmos. Chem. Phys. Discuss., 7, S1683 - S1685, 2007).

### **1 Replies to general comments**

- **“Ex-ante” and “ex-post” errors terminology.** In the first manuscript version we used this terminology to avoid terms like “a-priori” and “a-posteriori” errors which,

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in statistics theory, are standards reserved to error types different from those we are dealing with. Although adequately defined (see page 5451, lines 10-12), we agree that the “ex-ante” and “ex-post” terminology could be misleading for readers not interested in a careful reading of the whole paper. Therefore we agree to avoid this unconventional terminology. Namely, in the revised version of the manuscript we will replace the term “ex-ante error” with “error expected on the basis of error propagation calculations” or simply with “expected error”, depending on the circumstances. The term “ex-post” is presently used only four times and in the revised version of the manuscript it will be either skipped or replaced with terms like “error estimate determined in the intercomparison experiment”, as most appropriate.

- **Preamble sections describing the experimental setup of the correlative measurements.** Sometimes (as in the case of lidars) the accuracy of the validation measurements is similar to that expected from MIPAS, therefore it is very important to define and justify very carefully the accuracy and the precision of the validation measurements used. If the errors of the correlative measurements are not well defined we run the risk that the reader could attribute the discrepancies observed in the intercomparison uniquely to the MIPAS inaccuracies. Despite of that we agree that Section 6 can be significantly shortened. In particular, in the revised version of the manuscript we will cut the descriptive parts of Section 6 which do not deal with the lidar error characterization.

## 2 Replies to specific comments

1. **P.5439, L.27.** We argue that this comment refers to L.27 of page 5441 (near the end of the abstract). We agree to include in the abstract a few words describing the problem of ECMWF data (now the problem is discussed only in the second

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- paragraph of P.5485).
- P.5444, L.25.** We actually check if the difference profile is statistically consistent with zero. We will re-word this sentence to make the concept more clear.
  - P.5452, L.4.** The error  $\sigma_{t_{M,i},\text{sys}}$  is already defined immediately after Eq. 6 (P.5451, L.8). At L.4 of P.5452 we simply say that the values of  $\sigma_{t_{M,i},\text{sys}}$  used to calculate the fifth column of Table 1 (using Eq. 6) were taken from Dudhia, 2005.
  - P.5452, L.22.** The differences  $d_i(k)$  are defined at L.15, P.5451 as  $d_i(k) = t_{M,i}(k) - t_{c,i}(k)$ . To ease reading of the text, in the revised version of the paper we will refer more explicitly to “the differences  $d_i(k) = t_{M,i}(k) - t_{c,i}(k)$ ”.
  - P.5453, L.14.** Ok, agreed. In the revised manuscript we will change to 10.5 km.
  - P.5471, L.22.** Yes, exactly. 350 m is the average difference between MIPAS and radiosonde altitudes at matching pressures. The  $\pm 10$  m error is the standard deviation of the mean. In the revised version of the manuscript we will include a sentence clarifying this concept.
  - P.5500, Fig. 3.** In Fig. 3 crosses denote the mean value of the temperature difference in each range window, vertical bars are the 1-sigma errors of these means. Solid horizontal bars mark the weighted means for range windows below and above 450 km; dashed lines are the 1-sigma errors of these weighted means. We agree that presently the meaning of these lines is unclear, in the revised manuscript we will include the above explanation in the figure caption.
  - P.5507, Fig.10.** Ok, we agree. The caption of Fig. 10 will be corrected.
  - P.5512 and ff, Fig.s 14 to 16.** We agree that these Figures are not well visible in the present ACPD format (A4 with landscape orientation), however: Fig.s 15 and 16 should be well visible when placed each on a full A4 page with portrait

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orientation. We will improve the format of Fig.14 and we will make sure that all the three Figures will be well readable in the final ACP version of the paper.

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 5439, 2007.

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