

Comments to ACPD manuscript “On the quality of MIPAS kinetic temperature in the middle atmosphere”.

It has been a pleasure to review this manuscript. It is well written and contains a lot of detail about the retrieval approach and algorithm and the findings with the various comparison data.

p. 24237, line 12—The sentence beginning “Although ...” needs to be revised for clarity, possibly as two sentences.

Lines 20 and 21—HIDRLS should be HIRDLS

p. 24239/40—MIPAS data are definitely obtained with a state-of-the-art temperature retrieval algorithm.

p. 24245, Figure 2—Please explain the pattern of horizontal bands in the plots of vertical resolution.

p. 24247—Figure 3 is an excellent diagnostic of the accuracy of the pointing corrections and of the linear corrections for gradients.

On p. 24241 you used ECMWF fields for your initial horizontal T gradients. But here you seem to imply that you actually used a 2-D method to retrieve the horizontal gradient and account for it in the LOS algorithm. Please be clear about what you did.

p. 24254, lines 1-3—should say “show 2-3 K COLDER MIPAS...”, most likely due to the known SABER WARM bias at those altitudes.

p. 24255—It is also worth noting that the SABER V1.07 retrievals do not account for effects of LOS T gradients.

p. 24257, line 1—shows comparisons...

p. 24258, line 23—findings in Remsberg et al. (2008) were based on SABER V1.07, not V1.06. How did the SABER T bias change between the 2 versions in the mesosphere?

Line 28—HALOE temperatures merge to climatology near 80 km, I believe.

p. 24259—The vertical coordinate is altitude for the comparison plots. Are there any biases for the conversion of MIPAS pressures to ACE altitudes? Are the ACE measurements affected by horizontal temperature gradients?

p. 24261-64—Agreement between MIPAS and MLS is impressive, even though the scale of the x-axis of their difference plots is twice that of the SABER and ACE comparisons.

Section 3.4—Rayleigh lidar is our best “truth” measurement of middle atmosphere temperature. A comment would also be helpful here on the pressure/altitude conversion for these comparisons.

p. 24273, line 7—change to “MIPAS, the difference being smaller...”

Figure 20—There are 8 plots here, yet the caption says 6 dates.

Any comment about the differences with the sphere climatology? Mesospheric cooling trend? Bias in corrections at Mach 1 for data on sphere descent in the mid-mesosphere?

p. 24275, line 28—change to “all seasons, MIPAS being generally...”