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## ***Interactive comment on “Validation and data characteristics of methane and nitrous oxide profiles observed by MIPAS and processed with Version 4.61 algorithm” by S. Payan et al.***

### **Anonymous Referee #1**

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This is a generally useful paper on the validation of the MIPAS data products produced by ESA. I have numerous small comments and corrections: 1. The full resolution and reduced resolution modes are confusing to many people. The time period covered by this paper should be explicitly stated in the abstract (i.e. that this paper is about full resolution MIPAS data covering the period 9 July 2002 to 26 March 2004 (I think!) 2. pg. 18045, l. 2 ‘balloon-borne’; l. 25, quote the maximum optical path difference. 3. pg. 18046, l. 9, missing period; l. 26, ‘tracers’. 4. pg. 18048, l. 16, ‘HNO<sub>3</sub>’; l. 23, ‘and purely systematic’. 5. pg. 18049, l. 11, ‘cycles; however’; l. 26, ‘rather than altitude’. 6. pg. 18050, l. 5, ‘precisions’. 7. pg. 18051, l. 7, ‘show’; l. 19, ‘yield a reduction’; l. 24, ‘derivatives’ 8. There are many problems with figures: Figure 2 needs a legible x-axis

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label on the bottom; Figures 9 and 10 are too small and need to be split into 2 or 3 parts; Figures 11, 12, 21, 22, 26 are of very poor quality; caption of Figure 13, missing degree symbols; Figures 19 and 20, at the top remove '-P[ppm]'. 9. pg. 18053, l. 4, 'in the lower stratosphere'; l. 27, 'as discussed'. 10. pg. 18054, l. 1, 'Before...we must therefore check'; l. 16, 'obeys the two following'; last line, 'using the sum'. 11. pg. 18055, l. 9, 'equipment', l. 18, 'microwindows'; l. 20, 'contributes'; footnotes 1 to 3 should be moved to the references and updated (1 has appeared in ACPD and 2 will appear in a few days, 3 has appeared in JGR, not ACPD). 12. pg. 18057, l. 16, 'purposes', l. 17, the correlations with CFC-11 and CFC-12 are confusing: please clarify. If MIPAS-STR measures N<sub>2</sub>O and CH<sub>4</sub>, what is the point of using correlations? 13. pg. 18058, l. 8 'only at a tangent', l. 12, 'The corresponding...also have problems.'; l. 14, 'In contrast to N<sub>2</sub>O, for which the profiles oscillate around the MIPAS-STR values, many of the CH<sub>4</sub> profiles are completely different from the MIPAS-STR measurements (e.g.,...). This kind of problem cannot be explained by the lack of regularization.' 14. pg. 18060, l. 3 and 4, missing degree symbols. 15. pg. 18062, l. 15, 'criteria'. 16. pg. 18082 and 18083, Table 3 and 4 captions, 'small number of coincidences'. 17. pg. 18065, l. 8, 'unrealistic'. 18. pg. 18066, l. 21, 'in detail', l. 21, 'Two papers in ACPD and one in JGR...'; l. 22, 'De Mazière'. 19. pg. 18067, l. 8, 'solar absorption and gas correlation'. 20. pg. 18069, l. 9, 'is in any case', l. 12, 'ODIN-SMR', l. 13-15, delete. The obvious conclusion is that there may be a problem with ODIN-SMR and perhaps also the ASUR retrievals, as stated just below. l. 22, 'and temperature'. 21. pg. 18070, l. 7, 'In addition, the data'. 22. pg. 18071, l. 8-9, missing degree symbols. 23. pg. 18074, l. 1, 'The MIPAS data version 4.61 still exhibits unphysical oscillations in individual CH<sub>4</sub> and N<sub>2</sub>O profiles caused... As a consequence'; l. 13, 'using a temperature'; l. 26, remove the acknowledgement to the ACE team as ACE data was not used in this paper. 24. Check the references, there are a considerable number of small problems with names, punctuation, journal abbreviations, etc.

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 18043, 2007.

