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Atmospheric Measurement Techniques Discussions

Interactive comment on "Validation of revised methane and nitrous oxide profiles from MIPAS-ENVISAT" *by* J. Plieninger et al.

Anonymous Referee #1

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This is a well written and careful study in which a new MIPAS retrieval is compared to a number of other measurements, and it is certainly appropriate for AMT. I have some minor comments below, but my main suggestion is that it should be made clear early in this study how it fits in with other similar work which has been submitted by this group. There is a recent Plieninger at al. [2015 AMT] which, as I understand it, introduces the new retrieval and which is appropriately discussed early in this work. But there is also a reference to a recently accepted Laeng et al. [2015 AMT] which only covers CH4 and is apparently based on an older retrieval version which should certainly be referenced well before the conclusion. Are the averaging kernel methods used here the same as in that manuscript? If not, is it possible that the differences noted in the conclusion are the result of the different comparison methods and not the result of changing versions?

Indeed, it seems strange to mention in the conclusion that the bias between MIPAS CH4 and other datasets is reduced by 0.08 ppmv when compared with the validations performed in Laeng et al., but there seems to be no manuscript which shows a direct comparison between the two retrieval versions (is this true?).

Page 5 – "MIPAS retrieval uses a zero a priori". First, this is a bit unusual. Is there some reference explaining why this was done? Is it true for all MIPAS tracer retrievals (it is clearly not true for temperature, based on statements earlier in the manuscript), or only for these particular species, or only for these particular retrieval versions? Also, perhaps it would be better phrased as ". . . the a priori is set equal to zero".

In the next paragraph: "neglected elements below 0.001". It's not clear to me, based on statements later in the paragraph, whether negative terms with a larger absolute value than this are included or not (they certainly need to be). Would it be correct to write "neglected elements with absolute values below 0.001"? "lower most" should be "lowermost".

Page 6 – "In some cases this approach failed" – What does this mean? How can one "fail" to have a tropopause?

Page 8 – ". . . SCIAMACHY show, that" There should be no comma here.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 12105, 2015.