

Interactive
Comment

***Interactive comment on* “Technical Note: Continuity of MIPAS-ENVISAT ozone data quality from full- to reduced-spectral-resolution operation mode” by S. Ceccherini et al.**

Anonymous Referee #1

Received and published: 14 February 2008

General comments

The aim of this paper is to assess the differences in the MIPAS ozone product retrieved with the ESA processor before and after the severe instrumental failure incurred by the instrument in early 2004. The continuity of data quality (or assessment of changes in quality) through the lifetime of an instrument is primordial for proper use of the complete data set in scientific studies (year-to-year comparisons, trend calculation, etc.). The paper is well written and well structured. Therefore, this work is valuable to the ACP readership and publication in ACP is fully justified. Nevertheless, I would like the authors to address a few points which need clarification, from which this manuscript

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would benefit.

Impact of the new measurement scenario vs. the modified processing algorithm.

The reduced-resolution observations presented here combine a different setting for the measurements with significant changes in the processing scheme. Both factors contribute to the overall quality of the new (post-January 2005) O₃ product.

Hence 1) The title should clearly mention which processor is used since there are, apart from ESA's, other well established and documented scientific processors for MIPAS. I think the processor should also be mentioned throughout the paper when references to the new product are made (since the quality evaluation conducted here does not apply to other existing codes). 2) The following request is probably beyond the scope of the submitted paper. However, I would find useful (if possible) to have some elements on how the changes in the data product can be attributed to either the new measurement scenario or to the upgraded retrieval processor. Have the reduced-resolution observations been partly processed with any MIPAS scientific code? If so, an internal consistency check (for the full- and reduced-resolution observations) might be useful for future users of the MIPAS data.

Statistical significance/representativeness of the reduced-resolution data.

As pointed out by referee #2 there are some questions on the usefulness of this limited sample of retrievals. Firstly, there are two quite different scanning sequences that are used indifferently here, when the different altitude spacings might impact the results. Secondly, could the authors give their appreciation on the statistical significance of an ensemble of 86 profiles for the reduced-resolution observations when compared with 1633 full-resolution limb scans? If anything, increasing the number of new profiles might show that the quality of the former is in fact greatly improved.

Lastly, although the present Technical Note does not aim at validating the new product, a few words on the other validation studies in which the reduced-resolution data were used would, I think, be helpful to the reader.

Specific comments

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p.798, l.12 (and p.799, e.g. l.13): The processor used for the retrievals evaluated here should be clearly mentioned.

p.798, l.19-22: A few numeric values might be helpful for illustration.

p.799, l.14-15: Please give a few words of explanation for the dates (July 2002 and March 2006).

p.802, l.11: To my knowledge the validated ESA profiles were retrieved with the off-line processor. I find it a bit confusing in terms of semantics: should not the “near-real-time” retrievals only be considered operational? I would welcome some clarification (not necessarily in the paper) on the terms near-real-time / operational / offline.

p.803, l.13-15: For this reason, I think the concern raised by referee #2 should be clearly answered. Do the settings used here reflect what might be publicly released?

p.803, l.27: I don't understand how there can be only 86 profiles from 140 orbits. Also, I am currently aware of one study in which the reduced-resolution data are used (comparison with ACE-FTS) with a larger number of MIPAS profiles. It is difficult to believe that there would be less coincidences with GOMOS than with ACE-FTS. Please justify these low numbers.

p.805, l.28: Overestimated compared to what? Please provide a reference or some explanation.

p.807, l.17-19: I do not completely adhere to this statement. Indeed, a discrepancy between the comparisons could well be attributed to altered *instrumental* performances, but could also be due to *processing* differences. Therefore, an internal check with other MIPAS processors might be very useful. Please comment on this or reword.

p.810, l.15, and throughout: since the scanning sequences are given in kilometers and to help the reader, giving approximate altitudes corresponding to the mentioned pressures would be helpful.

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p.817 to 825, figures and tables: the tables state only altitude ranges, while the figures use pressure levels. Here also, approximate pressure values in the tables or, alternately, approximate altitude values on the right-hand axis of the figures, would help better link the scanning and microwindow ranges to the retrieved profiles levels.

Technical comments

p.799, l.20: I think the period should read “(March 2002-March 2004)”.

p.801, l.9: “square” should be plural.

p.801, l.20: “Fourier-transformed” (add the hyphen).

p.802, l.28: “...modified by introducing...” (by is missing) and “strenght” → “strength”.

p.804, l.22: “...geolocation of each GOMOS...”.

p.806, l.27-28: I would prefer “...exclusively. The selection was made...”.

p.807, l.7: “by” → “from”.

p.810, l.22: I would prefer “...3–40 hPa. Minor...”.

p.810, l.23: “...random error by up to...” (by is missing).

p.812, l.20: “...precision error larger than, or equal to, this of the full-resolution...”.

p.813, l.3: “...apart a single...” → “...except for a single...”.

References:

Missing accents or accented letters (e.g., p.814 l.5 “Megie” should be “Mégie”, “KyrI” should be “Kyrölä”, ...). Check throughout.

Incomplete lists of authors (e.g. p.815, l.23). Check throughout and complete.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 797, 2008.

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