

Interactive comment on “GOME-2 total ozone columns from MetOp-A/MetOp-B and assimilation in the MACC system” by N. Hao et al.

Anonymous Referee #2

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The paper discusses total ozone column data retrieved from GOME-2 instruments on board Eumetsat Metop-A and Metop-B satellites with the processor version 4.7. The main new features of the processor v.4.7 are well described. The paper presents the intercomparison of GOME-2A and GOME-2B total ozone data and validation them against ground-based measurements. Application of the GOME-2 data in MACC-II assimilation system is discussed as well. The paper is interesting. My specific comments are below.

COMMENTS

1) In Sect. 3.2 (and also in Summary), when discussing the differences in monthly mean data, the authors note that the observed differences can be partially explained

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by different sampling patterns. From my point of view, it is important to separate the influence of sampling patterns from the instrument-related features. This is easy to check by considering the collocated measurements only. I recommend presenting Figures analogous to Fig. 9 and 10 but based on collocated GOME-2A and GOME-2B data. This would allow a more certain conclusion about the data consistency.

2) I found the presentation of data for 2013 Antarctic ozone hole not logical in the Section 2, which is dedicated to the GDP 4.7 algorithm. The main message from the current Section 2.3 is that GOME-2A and GOME-2B data can be used together without additional corrections. I suggest therefore presenting the geophysical illustration of 2013 Antarctic ozone hole after intercomparison of GOME-2A and GOME-2B data. Furthermore, it would be beneficial to demonstrate the advantages of combined use of data. For such illustration, Figures 5 and 6 might be enhanced with showing data from GOME-2A only, from GOME-2B only, and combined data from GOME-2A&B.

3) P.2260 and P. 2277 “It is concluded that the total ozone columns (TOCs) provided by GOME-2A and GOME-2B are consistent and may be used simultaneously without introducing trends or other systematic effects.” This statement requires more quantitative explanation. If you consider trend analysis, the effect induced by a small bias should be compared with the average ozone trend. Regarding the “simultaneous use”, the illustration of joint use of the GOME-2A and GOME-2B data for 2013 Antarctic ozone hole can serve as a good example, and it is worth to mention this in the paper.

4) P.2269, the paragraph before section 2.3: How much the empirical correction factors change for successive months? Do you ensure continuity with changing month?

5) P.2272, line 18: Please indicate the collocation criteria and/or average spatio-temporal mismatch.

6) P.2272 lines 12–16 and Figure 12: What is shown by error bars? Please use the color for error bars consistent with the color of the mean-value curve (red and black).

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7) P.2276, line 14: Have OMI and GOME-2 been compared to each other?

TECHNICAL CORRECTIONS

P.2264, l.5 and Eq.(1): Please explain that VCD is denoted by $V(n)$

P. 2266 l.15: "reference spectra" -> "reference cross-sections" ?

P.2267, lines 20 and 21: change degree sign into K

P.2272, paragraph starting in l. 4: Please indicate that collocated data are used here.

Figure 1: Line notations are different: pluses in panel (a) and diamonds in panels (b, c, d). Are these all for GOME-2A FM?

Figure 14, left: in the x-axis label, should be "GOME-2A"

Figure 15: Please add y-axis label (unit) in panels (a) and (b). Figure caption: "from GOME-2 total column" -> "of GOME-2. . ."

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