

Interactive comment on “Operational total and tropospheric NO₂ column retrieval for GOME-2” by P. Valks et al.

Anonymous Referee #2

Received and published: 2 May 2011

This paper is a well-written description about the GOME-2 NO₂ retrieval, the improvement compared to GOME-1 and a detailed analysis of the errors. I recommend publication after some small changes as listed below.

Page 1620, line 26: the authors state that GOME provides global NO₂ on a daily basis, while in fact GOME observes NO₂ with a global coverage every 3 days and GOME delivers the data to the ground every orbit. Please clarify this sentence.

Page 1622, line 19: I suggest to put "level 0" in brackets behind "MetOp" in this line, to clarify the process.

Page 1624, line 1: Why is a cubic polynomial chosen and not a higher-order polynomial ?

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Page 1627, line 23: The use of the cosine of the latitude implies that the surface area is important for the relative value given to NO₂ in this climatology. The NO₂ derived at the poles in the climatology is not counting at all. Please explain this.

Page 1634, line 18-20: Please add a discussion why NO₂ profiles would differ for cloudy and adjacent cloud-free scenes.

Page 1638, line 4: The authors mention a seasonal variations in Figure 7. However, for GOME the variations are varying from daily to annual. I suggest to simply describe them as temporal variations.

Page 1641, line 16-23 and Figure 9: Striking in Figure 9 are also the enhanced errors along the ship tracks in the Indian Ocean and high errors along coast lines. These are not mentioned in the text, but seem worth some discussion.

Page 1644, line 18: The reference of Boersma et al., 2007 mentioned here for the TEMIS NO₂ product from SCIAMACHY is actually a paper about NO₂ retrieval from OMI. Please, either add OMI to the list of other satellite data sets or change the reference. Citation instructions are mentioned on the TEMIS website.

Page 1645, line 18: Please mention the version number of the SCIAMACHY data product.

Page 1645, line 20: Are the different angular dependencies solely caused by the time differences of the 3 instruments ?

Interactive comment on Atmos. Meas. Tech. Discuss., 4, 1617, 2011.

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