

## ***Interactive comment on “Near-real time retrieval of tropospheric NO<sub>2</sub> from OMI” by K. F. Boersma et al.***

### **Anonymous Referee #2**

Received and published: 5 December 2006

This manuscript presents an algorithm for the near-real time retrieval of tropospheric NO<sub>2</sub> from OMI. The algorithm is carefully designed and presented. The manuscript is exceptionally well written, with detailed and useful quantitative information. The analysis includes effects of clouds on the retrieval, and includes a comparison with SCIAMACHY. The manuscript should be of considerable value for the atmospheric chemistry community. I urge publication after minor revisions.

The effect of aerosols on the retrieval and the associated retrieval error should be discussed. Aerosols should be included in Table 1.

Section 5.1: Is a masking scheme employed to remove areas dominated by tropospheric NO<sub>2</sub> prior to assimilation of the total column? If so, please describe. If not,

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please comment on the potential error.

Section 5.2.3 and Table 1: It would be useful to comment on the dependence of the error budget depends on the NO<sub>2</sub> profile. What type of NO<sub>2</sub> profile was assumed in this calculation?

Questions continue to arise about the instrument sensitivity of GOME/SCIAMACHY/OMI to NO<sub>2</sub> near the ground. “E.g. How well does OMI observe NO<sub>2</sub> in the boundary layer?” It would be useful to include a statement about the vertical sensitivity of OMI to NO<sub>2</sub>.

Section 4.1: The weak change in absolute fitting error with latitude is surprising. I expected a weak change in relative fitting error that would translate into a latitudinal dependence in absolute fitting error.

End of section 5.2.1: The “best” cloud pressure will depend on the true NO<sub>2</sub> profile. However, the NO<sub>2</sub> profile will vary with region. Suggest add “weighted by the NO<sub>2</sub> profile” after (in the 405-465 nm range).

Section 5.2.2: Please specify the time of day at which the TM4 model NO<sub>2</sub> profile is sampled.

Top of page 12324: suggest add “spatial” in front of “undersampling errors could be discarded”. This avoids confusion with spectral undersampling.

Page 12308: What is a.o.?

Page 12318: The model NO<sub>x</sub> species (Ě. Do the authors mean NO<sub>y</sub>?

Page 12322: for cloud fractions larger than 0.1. Do the authors mean smaller?

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