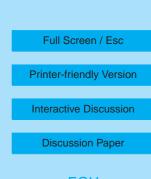**Atmospheric
Chemistry
and Physics
Discussions**

Interactive comment on "Near-real time retrieval of tropospheric NO$_2$ from OMI" *by* K. F. Boersma et al.

Anonymous Referee #1

Received and published: 6 December 2006

Conclusion:

This paper presents a new retrieval algorithm for the near-real time analysis of tropospheric NO$_2$ columns observed from Ozone Monitoring Instrument (OMI). The manuscript is both clearly written and organized logically. In contrast to off-line retrievals, where a priori information concerning the stratospheric column and distribution of NO$_2$ in the troposphere are acquired from model analyses following the observation, the near real-time method uses a priori information retrieved from a model forecast enabling calculation of the tropospheric column immediately following the observation. This paper represents an exciting addition to the growing literature of NO$_2$ satellite observations and should be published with minor revisions.

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General Comments:

1. The authors argue that the utility of the near-real time approach is in the ability to produce daily maps of NO_2 for potential application in air quality management practices. However, the discussion is focused primarily on monthly averaged data. Including at least one figure showing the quality of the daily image or a series of 2-3 days over a region where daily variations are significant, would be most interesting.

2. While the comparison of OMI NO_2 to SCIAMACHY NO_2 is highly valuable, it would be particularly insightful to see a comparison of the OMI near-real time and OMI standard NO_2 profiles as well, to assess the errors in the forecasted stratospheric contribution and the AMF. If this is complicated by differences in the across track variability correction method, is it possible to compare forecasted and standard a priori directly to obtain an estimate of the uncertainty of the near-real time method as compared to a best case scenario standard method?

Specific Comments:

1. page 12308 line 13: Is it possible to estimate the magnitude of these errors in geolocation? Are they smaller than the OMI pixel size? Can you estimate this from known locations of NOx sources?

2. page 12310 line 2: At what time is the standard product available?

3. page 12314 line 17 extra word "is"

4. page 12314 The authors provide a method for correcting for a significant amount of cross-track variability, is it possible to provide an estimate of the error induced by making this correction?

5. page 12325 line 18 10:00 h instead of 10:00 hr

6. page 12326 In the comparison of OMI and SCIAMACHY NO2, it would be helpful to include a reference to the diurnal shape of column NO_2 in an urban environment

from surface measurements. This would give confidence to both the magnitude and direction of the disagreement in urban areas.

7. Table 2, define 61555;s, 61555;Sst and 61555;Mtr in the figure caption.

8. Figures 5 and 6 should read top and bottom panel, instead of left and right.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 12301, 2006.

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