

Interactive comment on “The version 3 OMI NO₂ standard product” by Nickolay A. Krotkov et al.

Anonymous Referee #3

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This is a review of the manuscript “The version 3 OMI NO₂ standard product” by Krotkov et al. Overall, this is a very well written, straightforward manuscript that clearly describes updates to the Goddard OMI NO₂ retrieval. The overall reductions in tropospheric column NO₂ that are evident in the new retrieval have important implications for those who study air quality and policy makers that use these results to guide policy decisions. I recommend publication of this manuscript and offer some minor comments as follows.

General comments: How do the GMI model results used for the a priori compare to other models such as GEOS-Chem? Prior studies (e.g., Huang et al. 2015) show some differences between GMI and GEOS-Chem with the latter model comparing better to in-situ observations above the boundary layer. This may impact the results shown in this study and should be discussed.

What is the justification of reducing J(NO)? This is very significant. While Prather is

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held in high regard, it is important to offer some further explanation for this. Will this result be published soon?

For Figure 3, it would be very useful to not only show the differences in the retrievals but to also show the retrievals themselves for both the stratosphere and the troposphere.

How are negative values treated in the new retrieval? Are there fewer negative values in SP3?

Specific comments:

Figure 10. Please add error bars to the figure. It's difficult to interpret this figure otherwise.

Technical Corrections:

Page 9, line 23 Fig.3 should be Figure 3. If this is the first time it is referenced.

Page 12, line 1: I believe "North China Plane" should be "North China Plain", the caption of Figure 8. should be modified accordingly

Huang, J., Liu, H., Crawford, J. H., Chan, C., Considine, D. B., Zhang, Y., Zheng, X., Zhao, C., Thouret, V., Oltmans, S. J., Liu, S. C., Jones, D. B. A., Steenrod, S. D., and Damon, M. R.: Origin of springtime ozone enhancements in the lower troposphere over Beijing: in situ measurements and model analysis, *Atmos. Chem. Phys.*, 15, 5161-5179, doi:10.5194/acp-15-5161-2015, 2015.

Interactive comment on *Atmos. Meas. Tech. Discuss.*, doi:10.5194/amt-2017-44, 2017.

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