

Interactive comment on “The impact of satellite-adjusted NO_x emissions on simulated NO_x and O₃ discrepancies in the urban and outflow areas of the Pacific and Lower Middle US” **by Y. Choi**

Anonymous Referee #3

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General comments:

This is an interesting paper that characterized the changes in simulated surface O₃ and NO_x when replacing bottom-up NEI2005 NO_x emissions with the GOME-2 NO₂ column constrained (top-down) NO_x emissions over the contiguous U.S. The paper is well written and could provide some insights into the potential biases in the NEI2005 NO_x emissions over some regions of the U.S. The limitation of the study is fully discussed at the conclusion section. I recommend the publication of this paper after minor

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revision.

Specific comments:

- 1) Is there a particular reason to choose NO₂ column retrieved from GOME over those from OMI for this study?
- 2) Some details should be provided on how the GOME2009 emissions were obtained. I imagine that satellite NO₂ column retrievals are more accurate for regions with high NO_x (emissions), and may be less accurate (or below the sensitivity of the satellite sensor) for regions with low NO_x. How does GOME2009 account for those during the inversion process?
- 3) To me the significance of this study is its implication of potential NO_x emission biases in NEI2005, hence it would be valuable to discuss whether the likely biases in NO_x emission found this study is reduced in NEI2008.
- 4) Although well written in general, the manuscript is a bit on the lengthy sides. Maybe that it could be more concise.

Technical and minor comments:

On page 21166, Lines 20-23: When several observational sites collocate with one same model grid, do the observational data from those sites get averaged before comparing with simulated data for that grid point?

On page 21173, Lines 10-14: Not clear what “decreased in a more efficient manner” means. Did you account for PBL depth variability at night for this statement?

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