

***Interactive comment on “Impact of NO<sub>2</sub> horizontal heterogeneity on tropospheric NO<sub>2</sub> vertical columns retrieved from satellite, multi-axis differential optical absorption spectroscopy, and in situ measurements” by D. Mendolia et al.***

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This is an interesting paper that is well referenced. The introduction is well written and provides all necessary background for the reader to understand how the current work fits into the literature.

The overall finding of the research (horizontal heterogeneity biases satellite data) is not terribly new, though the authors do show some effort in characterizing this bias, and provide an interesting estimation of NO<sub>2</sub> VCDs via in-situ observations, which is

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interesting.

I have a few minor comments on the paper, and one larger comment. First, the equation references in the text need updated (e.g. pg 837 line 13, pg 839 line 14), and you need to correct  $1 \times 10^{17}$  to  $1 \text{E}10^{17}$  on pg 838 line 13.

In this analysis the authors do linear regressions of the data, though the abscissa uncertainty is quite large as seen in Figure 5. Therefore, this should be accounted for in your regression statistics (e.g. perform an orthogonal regression), which may be more beneficial to the reader. Can the authors update their statistics with this additional uncertainty accounted for?

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