

Interactive comment on “High-resolution (0.05° × 0.05°) NO_x emissions in the Yangtze River Delta inferred from OMI” by Hao Kong et al.

Anonymous Referee #1

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General comments: The manuscript entitled ‘High-resolution (0.05° × 0.05°) NO_x emissions in the Yangtze River Delta inferred from OMI’ focuses on developing a method to inverting NO_x emissions at a high resolution in major urban areas by using the long-term satellite measurements of nitrogen dioxide. The results show that the inverted NO_x emission dataset can reveal the features which are not well represented or not included widely used Multi-scale Emissions Inventory of China. Overall, though the topic is important and the methods are technically, the manuscript need be restructured and rephrased. I recommend to reconsider its publication pending the following concerns satisfactorily addressed.

Specific comments: 1. Why the shortest lifetime of NO₂ has the advantage to better relate NO_x emissions to NO₂ VCDs at the 0.05° × 0.05° resolution? 2. Page 6, Line

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1-7: What's the relation between the NO₂ retrieval with the AOD? The description is needed. 3. Section 2 is generally messy and lack of logics. What's the relation between the PHLET model and PHLET-A model? I suggest the authors rephrase the part 'data and method' more logically. 4. The main of this manuscript includes two parts: part one is to show the distributions of NO₂ basing on the retrieved emission data, part two is to evaluate above emission data. Thus, showing more explicit analyses are needed. 5. In Figure 1, why the NO_x emission and local net source are somewhat related to the lifetime of NO₂? The good relationship between the NO₂ VCD and lifetime of NO₂ can be understood well, however, the relations with NO_x emission and local net source are not taken for granted. 6. Figure 1 and Figure 2 should be rearranged. Fig. 2a-d can be combined into Fig.1a-d; Fig. 2e-f and Fig. 1f can be combined into one graph. The current arrangement is messy to describe. 7. Page 17, Line 6, what does 'Figure 3ows' mean? 8. How do the authors define 'anthropogenic' emission? Including what? 9. What's the reason of inconsistent difference of total anthropogenic NO_x emission in each city for summer inverted by this study versus from the MEIC inventory? Otherwise, the difference should be same for each city, that is to say, systematically higher or lower. 10. The tile of Section 4.3 should be 'Comparing our inverted emission dataset with the MEIC inventory', or more exactly, it should be 'Comparison between our inverted emission dataset with the MEIC inventory'.

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