Interactive comment on "NO$_x$ emission trends over Chinese cities estimated from OMI observations during 2005 to 2015" *by* Fei Liu et al.

Anonymous Referee #1

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Review of the manuscript: "NOx emission trends over Chinese cities estimated from OMI observations during 2005 to 2015" by Liu et al.

The manuscript presents a method to determine trends in NOx emission over China. The authors apply a methodology, introduced by the same authors in a previous paper, to determine NOx emission from satellite-based observations. The approach is particularly valuable as it is independent of chemical transport models and their uncertainty/assumptions. The results confirm the observed decline in the Chinese NOx emissions after year 2011. I recommend the publication after addressing the following comments:

Specific comments

1. Several recent studies have shown decreasing NOx levels in China from satellite

data. Can you evaluate how your trends compare with these existing results? This is mentioned in the introduction but it could be discussed in the conclusion too or where you present your numerical results? The results are derived at different resolutions I guess, but are you able to evaluate how consistent they are? For example, in this manuscript (Recent reduction in NOx emissions over China: synthesis of satellite observations and emission inventories doi:10.1088/1748-9326/11/11/114002) you analysed the NO2 peak year: how do the peak year for the provinces agrees with your latest city level results? Answering this question you should also be able to stress the added value of this work, compared to existing results.

2. Section 2.1 and later: You talk about "valid lifetime" or "satisfactory result" for the fitting: could you remind the reader how you define a satisfactory fitting? Especially for the power plants (only 7 good ones) can you explain the reasons for the unsuccessful fits?

3. Fig. 7 and page 8: What do you mean by market share of SCR? Share with respect to what? Could you define that?

4. Fig. 8 Can you comment on why for power plants there is a sort of bias, with bottom-up emissions generally higher than your emissions? (All points are below the 1:1 line)

5. Section 3.4 What kind a error/bias is due to the fact that you use summer days and clear sky data? How do you see this might affect your comparison with bottom-up inventories?

Technical comments

6. Figure 6 Please specify in the caption that you mean anthropogenic as bottom-up inventory, the emission you calculate by fitting are also anthropogenic, they might get confused. Also the color coding in confusing, could you use something else than red-blue in b-panel, because one might thing they relate to the red-blue of panel a, while

they are not.

C3