

Atmos. Chem. Phys. Discuss., referee comment RC2  
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## Comment on acp-2021-1089

Anonymous Referee #2

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Referee comment on "Spaceborne tropospheric nitrogen dioxide (NO<sub>2</sub>) observations from 2005–2020 over the Yangtze River Delta (YRD), China: variabilities, implications, and drivers" by Hao Yin et al., Atmos. Chem. Phys. Discuss.,  
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Yin et al., present a comprehensive study to look insight to the NO<sub>x</sub> trend from 2005 to 2020 over the Yangtze River Delta China by using the OMI space borne observations. Observations revealed that the NO<sub>x</sub> experienced an upward and downward trend during 2005–2020, with a threshold of 2011. And they applied the multiple linear regression model to understand the role of anthropogenic emissions and meteorological factor in NO<sub>x</sub> level. Model results showed that the seasonal change is mainly attributed to meteorological factor and the long-term trend of NO<sub>x</sub> is attributed to emissions. Overall, the dataset and analysis make sense and the topic is with the scope of ACP, I only have some minor comments to be addressed.

- Section 4.1, could you please provide more information about which two or three meteorological factors influence the level of NO<sub>x</sub> more significantly and conduct more discussions about the reasons in the main text?
- Inspired by the text in Line 422–423, I suggest the authors supply two figures (same as Figure 2 and 3 but from 2011–2019) in SI to take a look at the influence of COVID-19 to the NO<sub>x</sub> trend from 2011–2020.
- I can understand the motivation of using the GDP data in the discussions, while it seems that the GDP cannot be a perfect explanation for the trend of NO<sub>x</sub> emission, so I believe Figure 8 is not so important and can be moved to SI. By the way, I encourage the authors to collect some information about the motor vehicle emissions and major industrial emissions data in this region and analysis the NO<sub>x</sub> trend with these emissions.
- Line 271–273, please check the decrement of Anhui and the total YRD, as the data values are the same, may be a typo.
- Figure S2, NO<sub>2</sub> change to subscript.