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Comment on acp-2021-1089

Anonymous Referee #2

Referee comment on "Spaceborne tropospheric nitrogen dioxide (NO_2) observations from 2005–2020 over the Yangtze River Delta (YRD), China: variabilities, implications, and drivers" by Hao Yin et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-1089-RC2, 2022

Yin et al., present a comprehensive study to look insight to the NOx trend from 2005 to 2020 over the Yangtze River Delta China by using the OMI space borne observations. Observations revealed that the NOx 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 NOx level. Model results showed that the seasonal change is mainly attributed to meteorological factor and the long-term trend of NOx 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 NOx 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 NOx 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 NOx 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 NOx 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, NO2 change to subscript.