

Atmos. Chem. Phys. Discuss., referee comment RC1  
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## Comment on acp-2021-103

Anonymous Referee #3

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Referee comment on "Spatial and temporal variations of CO<sub>2</sub> mole fractions observed at Beijing, Xianghe, and Xinglong in North China" by Yang Yang et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-103-RC1>, 2021

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This is a carefully done study and the data is very valuable, but the preliminary data analysis and discussion have been done. What the main purpose of this study is? What's the main influencing mechanism of CO<sub>2</sub>? are there some differences with other big cities or megaregions?

- Please explain the data processing method and the proportion of valid data at the three sites.
- As CO<sub>2</sub> at XL is regarded as the background in this study, please explain whether there is a special data processing method for it, because the observational data at XL include not only the background information, but also local information about natural ecosystem and human activity, especially, the intake system of XL is on the roof.
- It is very pity that there are no meteorological parameters at XH. For the situation (2.1) and the meteorological field (2.3), it seems the air masses from BJ can be captured much more at XH because "the percentage of wind frequency in the north region is 34%, 36%, 50% and 60% respectively from spring to winter". And the air masses can be captured at XL only when the wind comes from SW.