

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2021-536

Anonymous Referee #1

Referee comment on "Quantifying urban, industrial, and background changes in NO₂ during the COVID-19 lockdown period based on TROPOMI satellite observations" by Vitali Fioletov et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-536-RC1>, 2021

The manuscript titled Quantifying urban, industrial, and background changes in NO₂ during the COVID-19 lockdown period based on TROPOMI satellite observations is well-timed and the scientific team very knowledgeable on all aspects on this topic. A previously established methodology, on identifying and separating space-based sulphur dioxide observations, is used here as well. However, the manuscript is lacking in numerous respects [see detailed annotated pdf] and does not appear of similar quality as previous works of the scientific team. It is also very long, the supplement enormous, and the methodology needs to be validated/established first, as applicable to tropospheric NO₂ observations, before serious statements may be made. I would propose a separation in Part A and Part B, where in Part A, all the methodology/dataset manipulation will be discussed and the first results, for say North America [US & Canada] are presented, followed closely - if not simultaneously - by Part B which discusses the global aspect. I suggest the authors take their time in addressing all comments and deciding how to proceed.

Please also note the supplement to this comment:

<https://acp.copernicus.org/preprints/acp-2021-536/acp-2021-536-RC1-supplement.pdf>