

Atmos. Chem. Phys. Discuss., referee comment RC1 https://doi.org/10.5194/acp-2021-536-RC1, 2021 © Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.

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