

Interactive comment on “Does reduction of emissions imply improved air quality?” by Cheng Fan et al.

Anonymous Referee #1

Received and published: 29 December 2020

I have reviewed the manuscript “Does reduction of emissions imply improved air quality”. In this work, authors used TROPOMI tropospheric NO₂ together with ground-based monitoring data in 11 regions around large cities to evaluate the evolution of their concentrations during 19 weeks after the Spring Festival and their effect on air quality. Based on the review criteria of ACP, my comments are as follow. General comments: 1, the content of this article hardly supports the title. The title of this paper has an implicit meaning that a significant reduction in emissions occurred during the closure period. Generally speaking, it is right. However, the difference in the degree of reduction of emissions of different species directly determines their impact on the atmospheric environment. This work only provides evidence on the reduction of NO_x, which has already been reported in many previous works. Reductions or variations

C1

of other pollutants are necessary to evaluate Changes in emission sources. 2, This work posed more questions than it answered. Actually, in February and March 2020, many researchers in China, even including many average Chinese, had already intuitively noticed that the air quality does not seem to have improved significantly after the pandemic lockdown, and there are even signs that it is getting worse. After June, such a feeling was confirmed by many research papers. Now, people are now curious as to why this phenomenon has occurred. I would encourage authors to answer this question but not to “discover” it again.

Specific comments: 1, the introduction is lengthy and lacks the necessary logic, which makes it a bit hard to follow. Besides, Lines 69-81 are not relevant with this work. Maybe, authors can supplement a table in the Appendix or section 2 to describe lockdown measures and period in different regions. 2, the study area is called as “east China” as shown in figure 1. I think the co-called “east China” covers parts of North, Northeast, Central, East, South, Southwest and even Northwest China. When I saw the term “east China”, I thought this work focused on Yangtze River Delta. 3, regarding extraction of baseline of NO₂, authors should utilized some professional analytic tools rather than simply averaging. See “Long-term trend and variability of atmospheric PM₁₀ concentration in the Po Valley”. 4, similar with comment 3, it is necessary to carry out hypothesis tests to draw conclusions on whether air quality returned to the normal level. Simply showing the change curve does not lead to any statistically significant conclusions. 5, the quality of figure 5 is too low to be published in an academic journal. 6. This work hardly provided evidences regarding changes in meteorological conditions. As far as I know, meteorological conditions play a role in determining air quality that is nearly as significant as that of emissions.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2020-1101, 2020.

C2