The authors have addressed all the comments and the manuscripts has been improved after the revision. The reviewer recommends acceptance after minor revision.

Response:

We thank the referee's positive comments on our revised manuscript. Our point-by-point responses are given below.

General comment:

A new emission tool has been developed in this work, which generates emissions over Mainland China at a monthly basis and at provincial level. Is it possible to increase the temporal and spatial resolution in this emission tool? In other words, is it possible to apply your emission estimates to study urban scale air quality or air pollution events? In that sense, we may need separate estimates for weekdays/weekends and urban/rural areas. As for the covid-19 impacts, it would also be interesting to see how different the impacts are over urban and rural areas. Also, if we want to use those emissions to drive the chemical transport model, how do you deal with the spatial resolution issue?

Response:

This work generated emissions by month and by province because the near real-time data we can access is only available at monthly and provincial levels at present. It is possible to increase the temporal and spatial resolutions in our emission tool once we get the data of higher resolutions. To support chemical transport model simulations, we allocated our estimated emissions in 2020 to higher resolutions based on the source-specific emission maps of the most recent year, which were derived from the MEIC 2019 emissions in this study.

Specific comments:

Section 2.3, what meteorological input is used for the model? I assume they are different for 2019 and 2020, is that correct?

Response:

The meteorological fields were simulated by the WRF model, which was initialized by the NCEP FNL Operational Model Global Tropospheric Analyses dataset. The meteorological fields were simulated for 2019 and 2020 separately. We have clarified it in the revised manuscript.

Figure 6, there is an overall agreement on the relative changes of air pollutants between model estimates and surface observations. One thing we need pay attention is that the differences in meteorology between 2019 and 2020 could also play a role here. Also, it looks like the correlation is poorer over Yangtze River Delta than North China Plain. Is that something related to much larger uncertainties in the emissions over Yangtze River Delta than North China Plain or more likely due to inherent model uncertainties?

Response:

The poorer model performance over Yangtze River Delta than North China Plain is possibly caused by the inherent uncertainties in the simulation of meteorological fields, which involves larger uncertainties over a coastal and complex terrain area (e.g., Yangtze River Delta) than in a plain area (e.g., North China Plain).

Page 9, line 255-261, any explanations on such a large difference in NOx emission reductions between your estimates and Zhang et al. (2021)?

Response:

We have compared our bottom-up estimates of NO_x emission reductions with different top-down inversions in the main text. Only the comparison with Zhang et al. (2021) shows a large difference. They estimated a decline of 53.4% in China's NO_x emissions during COVID lockdown than the same period in 2019, which is much larger than the observed decrease of about 30% in the surface NO_2 concentrations over China. It is difficult to identify the primary source of discrepancy shown in these comparisons because it could be caused by uncertainties in emission inventory parameters, inverse modeling framework, and the satellite retrievals used to constrain the inverse models.