

Atmos. Chem. Phys. Discuss., referee comment RC2
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Comment on acp-2021-328

Anonymous Referee #2

Referee comment on "Aerosol transport pathways and source attribution in China during the COVID-19 outbreak" by Lili Ren et al., Atmos. Chem. Phys. Discuss.,
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The authors investigated aerosol transport pathways in China during COVID-19. They established the source-receptor relationships among various regions of China using the CAM5 model with the capability of aerosol source tagging. The model system was developed by the same group of this paper and was evaluated in their previous studies. This work suggests that local emissions contribute largely to the severe aerosol pollution in North China Plain and Eastern China during COVID along with moderate impacts from unfavorable meteorological conditions. Overall, this paper reads well and provides interesting results, which could benefit the design of air pollution regulation strategies in China. I have two major concerns about the manuscript in its current form, which need to be resolved before it can be accepted for publication.

The first problem is that the CAM5 model used in this work cannot simulate nitrate and ammonium aerosols, while these compositions account for a large proportion of aerosols over China currently. Please provide detailed explanations and discussions on how this model deficiency could impact the main conclusions of this work.

The second problem is that the focus of this work is the aerosol source attribution during COVID. However, the authors did not discuss much the special findings in this special period. Compared to previous literature, are there any novel results and conclusions of the contributions from local/nonlocal sources to aerosol pollutions during this period with low emission levels? And what's the implication for air pollution control policies in China, especially considering that the anthropogenic emissions will be rapidly reduced in the future?