Atmospheric Chemistry and Physics Discussions

Atmos. Chem. Phys. Discuss., referee comment RC2
https://doi.org/10.5194/acp-2020-1185-RC2, 2021

Comment on acp-2020-1185

Anonymous Referee #2

Referee comment on "Impact of international shipping emissions on ozone and $PM_{2.5}$ in East Asia during summer: the important role of HONO and $ClNO_2$" by Jianing Dai and Tao Wang, Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2020-1185-RC2, 2021

The effects of ship emissions on the formation of O3 and PM2.5 have a significant impact on the climate, air quality, and human health. However, limited attention has been paid to the production of ship-related radicals in evaluating the effects of ship emissions on secondary pollutants. This study used a revised regional chemical transport model (CBMZ was updated to CBMZ-ReNOM) to simulate the spatial distributions of HONO and ClNO2 produced by ocean-going ships and their effects on the formation of O3 and PM2.5. Overall, this is a fundamental work with clear importance. It fulfils the necessary requirements to be published. I recommend it for publication after the authors consider several minor revisions to the manuscript.

The model simulations were performed from June 28 to July 31, 2018. It's the summer time for east Asia. Can you expect what's the change of main conclusions if you expand the simulation to all seasons? If it's hard to expect the results for different seasons, the title should be specified to summer.

The HONO emissions from land transportation sources were calculated using land-based NOx emissions and the HONO/NOx ratios (0.8% for gasoline and 2.3% for diesel). It should be noted that the estimation is quite rough. It would be useful to give a range of HONO and check the impacts.

The underpredicted O3 on land is larger than on maritime regions. Are there any correlations between the two? If so, is the ReNOM scheme still important?

Fig. 2. Both of the concentrations of HONO and ClNO2 are very low on the ocean. How can you determine the contribution from ships is accurate, not noise from the model?

Fig.6d and 8d show a hot spot in inland area of south China. As the inland river ship

emissions were not included in this study, how to explain the reason for the most significant changes happened in inland, which is isolated from shipping emissions? In another words, if other reasons would drive to such high increment, how to confirm the other increments are from ships not noise?

Current titles for Fig. 6 and 8 are not appropriate.

section 3.2 and title for section 3.3 are missing.