

# ***Interactive comment on “Decadal evolution of ship emissions in China from 2004 to 2013 by using an integrated AIS-based approach and projection to 2040” by Cheng Li et al.***

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1. The advantage(s) of the ship emission inventory developed in this study over previous ones are not sufficiently highlighted in the manuscript. In the Conclusions, the authors may give some suggestions for the modelers and other users who want to make a choice among different ship emission inventories. Response: The advantages of ship emission inventory are threefold. 1) We used two different methods (cargo-based and port-based) to estimate and mutually validate emissions; 2) We calculated the ten-year trend of ship emissions from 2004-2013, and made projections in different scenarios with implementation of DECA; 3) We established a methodology in using

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limited AIS data to develop ship emission inventory. Such a methodology can be used in other parts of the world, as most of the time it is unable to collect a complete set of AIS information. The above advantages are discussed in the Implication section of the manuscript. The above information is added in lines 31-32 of page 18, and lines 1-4 of page 19.

2. BC and OC are important components for air quality, visibility and climate simulations, and they are included in nearly all emission inventories for modeling purpose. However, BC and OC are not considered (or reported) in this work. Is it easy to add these two components? Response: We added BC and OC analysis in the revision.

3. P3, L13: The literature (He et al., 2015) cannot be found in the References list. Response: We instead provide three peer-reviewed publications for the Multi-resolution Emission Inventory for China (MEIC) (Li et al., 2014; Zheng et al., 2014; Liu et al., 2015).

4. P4, L4: Better to provide specific names of the three classification schemes. Response: Specific names are provided in the revision.

5. P26, Fig.5a: Should the line colors of the coast match those in the pie? Green color (for YRD in the pie) cannot be found in the lines for the coast. Response: Revised accordingly.

6. P28, Fig.7: The current color bar is not clear to see. Are the ship emissions associated with Taiwan ports taken into account? How about the emissions over the South China Sea? Response: We have changed the color bar to become more visually clear. Taiwan ports were not taken into account due to the absence complete data sources. Our research domain only covered 200Nm offshore, therefore didn't account for the entire South China Sea.

7. The term 'HC' is used in the text while the term 'VOC' is given in Tables 8 and 9. There are so many abbreviations used in the manuscript. The authors might consider

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giving a list of abbreviations as Appendix? Response: All VOCs have been changed to HCs. We also provide a list of abbreviations as Appendix, as suggested.

Reference: Li, M., Zhang, Q., Streets, D. G., He, K. B., Cheng, Y. F., Emmons, L. K., Huo, H., Kang, S. C., Lu, Z., Shao, M., Su, H., Yu, X., and Zhang, Y.. 2014. Mapping Asian anthropogenic emissions of non-methane volatile organic compounds to multiple chemical mechanisms, *Atmospheric Chemistry & Physics*, 14, 5617–5638, doi:10.5194/acp-14-5617-2014. Liu, F., Zhang, Q., Tong, D., Zheng, B., Li, M., Huo, H., and He, K. B.. 2015. High-resolution inventory of technologies, activities, and emissions of coal-fired power plants in China from 1990 to 2010, *Atmospheric Chemistry & Physics*, 15, 13299–13317, doi:10.5194/acp-15-13299-2015. Zheng, B., Huo, H., Zhang, Q., Yao, Z. L., Wang, X. T., Yang, X. F., Liu, H., and He, K. B.. 2014. High-resolution mapping of vehicle emissions in China in 2008, *Atmospheric Chemistry & Physics*, 14, 9787–9805, doi:10.5194/acp-14-9787-2014.

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