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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Emissions factors for gaseous and particulate pollutants from offshore diesel engine vessels in China" *by* F. Zhang et al.

Anonymous Referee #1

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This manuscript provides emission factor measurement for three ships in China and investigates the effect of engine load.

Although the paper appears to have robust measurement methodology, there is a deficiency in comparison to available literature, and placing the results the appropriate context.

I had difficulty in understanding what place these results had in the picture of the ship emissions measurement community. There does not appear to be a well defined focus for the work. If the goal is to claim the Chinese ships are somehow different then there must be extensive comparison to available literature, as well as assessment of ship type distribution from available inventories. If the goal is to add measurements of three

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ships to the database of measurements, then this can be done in a simpler way. If the goal is to suggest that current Chinese inventories are incorrect then there was no re-assessment based on the refined emission factors, even a course re-calculation.

Please consider what your focus is and ensure this message is shared effectively.

The discussion of emission factors with load should be compared much more thoroughly to available data. Only a limited number of references were chosen to compare to. There is a significant amount of data in the Lloyds register, Europe and elsewhere that can be compared to, and this should be done to place the results in appropriate context. (Marine Exhaust Emissions Research Programme, Lloyd's Register of Shipping, London, United Kingdom, 1995, http://ec.europa.eu/environment/air/pdf/marine_exhausts.pdf)

Do these results really represent a different sub-population of emission factors due to location, maintenance etc, or are they just within the standard deviation of the current data?

The authors claim that the majority of ships in use in China are of the type investigated in this study, however it would be informative to see a breakdown of slow speed, medium speed and high speed engines (and sources) to understand the distribution of engine types.

The manuscript refers to studies that are quite old. For example, the global PM burden for ships is a 2000 reference that likely uses data that is 20 years old. The most recent IMO greenhouse has study would provide a much more appropriate reference. There are a number of studies referenced where more recent studies are available. These should be sought out.

Uncertainties (labeled as 'error' in the manuscript) are not death with appropriately. There is no discussion on uncertainties of the gas phase measurements. There is no discussion on how the uncertainties are propagated which are then shown on the bar

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charts.

There are minor reference issues. Many of the large strings of references are put mid sentence and can go at the end. The reference to Lack and Corbett 2010, should actually refer the Lack et al 2008 study on light absorbing carbon from ships. Some references have the name twice (e.g. Cooper et al. (Cooper, 2003))

P23521: The discussion on OC/EC ratios does not consider that dilution, which was not used of this study, can significantly affect the amount of OC measured. Dilution will contribute to different OC/EC ratios.

Unfortunately I cannot recommend publication until the authors provide a focus for the results.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 23507, 2015.