

## ***Interactive comment on “Characteristics of marine shipping emissions at berth: profiles for PM and VOCs” by Qian Xiao et al.***

**Anonymous Referee #2**

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The manuscript presents the emission factors of speciated particles and VOCs from 20 marine container ships at berth in eastern China. The secondary organic aerosol yield and ozone forming potential are estimated based on measured VOC species, and information on major chemical components and their number size distributions given. While acknowledging that such kind of study is import for regional and even global air quality assessment, I do have some concerns on the methods used in this study. I would recommend the manuscript not to be accepted unless the following issues have been well addressed.

(1) As stated in the manuscript, a total of 93 VOC species were detected and all of them have carbon numbers larger than four. Is it due to the limitation of the equipment and analyzing method used that lower carbon compounds were not detected? Or, that

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is a real atmospheric phenomenon?

(2) A large amount of Na-rich particles are found in the sampled exhaust from the ships, which has been attributed to full of sea salt in the intake of ships. If so, could sea salt also have perturbations on other elements such as K, Mg, and Fe as well as OC? Would such a perturbation depend on environmental and meteorological conditions during the sampling time?

(3) As described in the manuscript, ambient particle sampling was conducted from 27 December 2016 to 15 January 2017. However, the positions of the ships and measurement site during the experiment are not well introduced. Since the ambient particle sampling was conducted in an open atmosphere, the local meteorological conditions should have a large influence on the experimental results. The ship plume effect needs to be investigated in detail.

(4) It is unclear and misleading to use a percentage to describe the ratio of sulfate particles from shipping emissions (a flux) over ambient sulfate particles (a concentration).

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