EGUsphere, referee comment RC1
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Comment on egusphere-2022-767

Fan Zhou (Referee)

Referee comment on "Determination of NO_x emission rates of sailing inland ships from on-shore measurements" by Kai Krause et al., EGUsphere, https://doi.org/10.5194/egusphere-2022-767-RC1, 2022

general commentsï¼□

In recent years, the monitoring of ship emissions mainly focuses on ocean-going vessels, and there is a relative lack of relevant research on inland ships. The author's work includes a large number of monitoring experiments for inland ships. Therefore, it is an important monitoring report. However, I think the manuscript needs some modifications to improve it. Recommendations are as follows:

specific commentsï¼□

- The authors claim that "In contrast to relative emission factors (in grams per kilogram fuel), the emission rates (in grams per second) do not need further knowledge about the fuel consumption of the ship and can therefore be used directly to investigate the effect of ship trafi¬□c on air quality." In the part of Introduction, the relevant discussion is mainly about the measurement of emission factors. Whether there are other studies that measure emission rates? If there are relevant studies, it is recommended to supplement them and carry out necessary comparison (emission rates and emission factors), discussion, and analysis.
- Emission factors are often used in the compilation of emission inventories, so can emission rates be used in the compilation of emission inventories? If so, whether there are relevant studies.
- In the introduction, it is suggested to supplement the discussion on the related research of inland ship emission monitoring, and the particularity of this research. On the whole, the content of the introduction is relatively small, so it is suggested that the authors make supplement on recommendations 1, 2, and 3.
- "The on-shore measurements were carried out using standardized air quality monitoring stations". I suggest a detailed introduction of the equipment, such as principle, accuracy, precision, measuring range, sensors. And comparison with related studies.
- I feel that the analysis of uncertainty factors is too little, and need to explain the

possible error sources and effects in more detail.

- In line 153, I think it would be clearer and more concise to present the results of the two experiments separately. Also, abbreviations do not seem to be used. DURH and NERH.
- If I understand correctly, this emission rate refers to the emission rate of the target ship (from AIS). Then I think it should be stated in the abstract and the text, otherwise there seems to be a certain ambiguity.
- Confusion of logic and structure in Result. The results of emission rate were chapter 4, compared results were chapter 4.1 and 4.2, respectively. Three subsections might be more appropriate; "In order to validate the emission factors within the CLINSH project", but the results in chapter 4 are emission rate. In other words, the result is emission rate, but validation is emission factor. Please clarify the logic in your argument.
- The authors propose to measure the emission rate rather than the emission factor, but the emission rate is compared with the emission factor. I am curious about whether the equipment used by the author contains a carbon dioxide sensor, and if so, whether it can be directly used to calculate the emission factor?

technical correctionsï¼□

- Please add descriptions that NOx=NO+NO_2, when the NOx first appearedã□□
- Some of the symbols in Figure 2 are not clear, Va, Vb, IV, up, down.
- line 154, Does "quality criteria" means that raised in 3.4 "Quality control"? If so, please mention it.
- Figure 5, symbol don't know what it means. Although mentioned in Table 2, it seems inconvenient to read.
- In conclusion and other parts, one sentence as a paragraph is not recommended unless it's an important conclusion.