Atmospheric
Chemistry
and Physics
Discussions

Interactive comment on "The impact of ship emissions on air quality and human health in the Gothenburg area – Part I: 2012 emissions" *by* Lin Tang et al.

Anonymous Referee #1

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The study investigates the health impacts due to exposure to air pollution due to local and regional shipping activities in the Gothenburg area in the year 2012, as well as the contributions of shipping to the overall pollutant levels over the area, using a fine resolution city scale air pollution model and a health impact assessment model. The paper is easy to follow, with clear presentation of the methodology and discussion of results. I favor the publication of the paper in ACP given my comments below are addressed.

Line 35-36: Is this the summer mean or annual mean, please rephrase the sentence.

Please provide relative contributions (%) along with absolute contributions

Line 157: "exposure-response function"

Line 296: What is spatial resolution of the SMED database that is the source of these "other" emissions and how are they regraded into 1x1 km resolution? In addition, how are there emissions regridded to the TAPM resolution of 250 m?

Section 2.2.2: Does road traffic include resuspension so that it is the largest PM10 source in the domain?

Section 2.4. Why no model evaluation for PM2.5? Section 3.2.4 includes some discussion on modelled vs measured PM2.5, why not include these in the model evaluation section? It is very important as PM2.5 is the main health impact pollutant and errors in PM2.5 simulations lead to underestimations in the health impacts.

Section 2.5: Are the age intervals taken into account? If not, please discuss potential shortcomings. How are the chronic vs acute impacts taken into account?

Section 3.2. Please provide with relative contributions along with absolute contributions throughout the text.

Section 5. How about the linearity of the ERF? There are studies clearly showing that assuming a linear relationship can lead to significant under or over estimation of health impacts depending on the concentration range. This should be discussed, I think.

Brandt et al., 2013 is not cited in the text.

Figure 8 could be made similar to figure 11, showing the monthly means as it is a bit crowded as it is now. In addition, both figures could use stacked bars instead. Finally, it would be great to create a similar figure where it shows the contributions from other pollutants as "others", that can be splitted into local and outside of Gothenburg and Sweden if possible, as in Im et al., ACP, 2019.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2020-94, 2020.