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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Effects of ship emissions on air quality in the Baltic Sea region simulated with three different chemistry transport models" *by* Matthias Karl et al.

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This manuscript discussed air quality impacts using three models. The uncertainties of emissions, meteorology, chemical reactions and physical processes were discussed in detail. Overall, this is a good paper. Some technical questions:

1. The CMAQ version is too old to include advanced SOA mechanisms. Wildfire emissions were not included in emission inventory. All of above could be the reasons for low estimation on summer SOA. These disadvantages should be fixed or at least discussed.

2. Authors should add the model validation for meteorology parameters.

3. Table 2, how do you get the "average fractions of the total emission in each vertical model layer"? This factor and its source need a very detailed description. Why the highest emission could reach 1000m in SILAM model? If this is true, the deposition process would be influence a lot.

4. The references and equations for NMB, R, RMSE and FAC2 should be added.

5. The last sentence in section 3.3.2 is not accurate. It should be "NOx-limited regime in the model".

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