

Interactive comment on “Optical source apportionment and radiative forcing of light-absorbing carbonaceous aerosol at a tropical marine monsoon climate zone: the importance of ship emissions” by Qiyuan Wang et al.

Anonymous Referee #2

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This study performed ground measurements in a small city at the very south end of continental China along the South China Sea. The authors attempted to attribute the sources from the composition and absorption measurements using receptor models, however the analysis of the entire study is rough and the conclusions are vague for the current version.

-Many pieces of essential work are missing, which should all appear in the main figures. I only list a few examples: the time series as classified by clusters, the diurnal variations of absorption for each cluster (to exclude the possible local sources), complete

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statistics of all parameters are required (BC mass, AAE, PM, compositions). Please do a complete and sound analysis and just show it. Otherwise, the conclusions are based on nowhere.

-many issues here regarding the source attribution. The local source influence needs to be clearly excluded, or by some way to show it is of minor influence compared to the regional sources you stated. Not clear with the definition of secondary substance, most organic and mineral should also be primary? Where did the dust come from, I don't think there was any dust sources rather than some sea salt. The shipping emissions are not really supported with any other external data source (I don't know what is that because I can't see anything from the current analysis done so far).

-The PMF analysis seems not quite convincing, could you provide more details about the scenarios. And even so, would you really believe to incorporate the spectral absorption in parallel with the offline composition will really give some physical meaning? There seems no signature of sources on the absorption. The time resolution is different between online and offline measurements, did you just average the online data into a very low time interval.

-MAC of organic should be normalized by organic matter (including all elements) not only organic carbon. The MAC of organic here doesn't mean anything.

- I am not convinced with the forcing calculation and the directly correlated heating. I don't think you really need to make that calculation as the main job of this study is to get the absorption attribution properly. The forcing largely relies on the vertical distribution of AOD and SSA, which you don't really have such information, which is beyond the scope of this study though.

-No need such redundant description for the trajectory clustering, as this is not your original work and has been so widely used previously, which was just output using some user-friendly software.

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