

Biogeosciences Discuss., referee comment RC1
<https://doi.org/10.5194/bg-2022-140-RC1>, 2022
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Comment on bg-2022-140

Liyang Yang (Referee)

Referee comment on "Spatio-temporal distribution, photoreactivity and environmental control of dissolved organic matter in the sea-surface microlayer of the eastern marginal seas of China" by Lin Yang et al., Biogeosciences Discuss.,
<https://doi.org/10.5194/bg-2022-140-RC1>, 2022

Marine DOM is important in the carbon cycle and the ecosystem functioning. Sea-surface microlayer (SML) is an important interface between the atmosphere and the seawater, and had distinct biogeochemical properties from the subsurface water. To date, there is little information on the optical properties of DOM in the SML. This study examined the changes and underlying mechanisms of DOM in the SML of Yellow Sea and East China Sea, using measurements of multiple proxies. The authors revealed an overall enrichment of DOM in SML with evident variability for both different regions and seasons and for different chemical species. They also tested the influences of environmental factors and photo-degradation based on field observations and incubation experiments. Overall, this study is focused on an interesting and novel issue with a large comprehensive dataset. The results from this study would make a nice contribution to the field of marine DOM study.

Major comments:

- Line 21 and Line 288-290: Please note that marine DOM usually has higher absorption slope than terrestrial DOM, and the higher slope (no matter it is S320-412 or S275-295) means higher absorption coefficient at shorter wavelength (not longer wavelength). In addition, it is not appropriate to assign S275-295 to terrestrial.
- Line 254: The fluorescence at Em 310 nm can be assigned to tyrosine-like component, but that at Em 375 nm can not. In addition, Em is described as 310 (375) nm in the text, but is 375 (310) nm (microbial or marine humic-like) in Table 1. The number in the parenthesis means the position of the secondary peak. Please double check.
- Line 215-216: Please show the absorption spectra in the supplementary file. I am

wondering if there is any shoulder peak that is reported for algal DOM? If so, it would be needed to use the absorption coefficient at longer wavelength for CDOM level.

- 6: Some DOC data exceed 100%, please give some explanation (e.g., contamination or analytical errors?).
- I can not find the supplementary files. Please double-check if the supplementary figures and tables were uploaded.

Minor comments:

- Line 93-95: Five or four cruises? Please double-check.
- Line 96: Please move the sampling map from the supplementary file to the main text, if there is no limit on the number of figures.
- Line 104: Please show a photo for the sampler in the supplementary file.
- Line 105-109: Please clarify the thickness of the SML sampled.
- Line 121-123: Were the quartz tubes placed in the water bath? If so, at which water depth?
- Line 133-136: Did you carry out the baseline correction (e.g., subtracting the mean absorbance over 700-800 nm)?
- Line 150-152: Please note that SUVA₂₅₄ is calculated as dividing the absorbance at 254 nm (not the absorption coefficient) by DOC.
- Line 260: "increasing DO level", please show it in the figure or supplementary file. Please check DO or AOU is used?