

Biogeosciences Discuss., referee comment RC2
<https://doi.org/10.5194/bg-2022-140-RC2>, 2022
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Comment on bg-2022-140

Anonymous Referee #2

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-RC2>, 2022

Yang et al.

This paper present the spatial and temporal distribution, photoreactivity and environmental control of dissolved organic matter in the sea-surface microlayer of the eastern marginal seas of China. The paper has a good database and discussion, with only a few comments from my side.

Introduction: all citations in the introduction were outdated. Seem like you missed a lot of important CDOM studies in the SML. Please add an updated reference (within 5 years). I believe there are many studies on CDOM in the SML has been published recently.

Line 42: The surface-active compounds were found to be enriched in the SML at a wind speed of 13 m/s. (<https://doi.org/10.1002/2017GL072988>)

Line 47: Explain why the role of SML in oceanic emission is not well understood.

Line 50: The processes leading to the enrichment of DOM in the SML are not solely controlled by changes in the DOM concentration at the sea surface microlayer, but are more complex.

Mustaffa, N.I.H., Badewien, T.H., Ribas-Ribas, M. et al. High-resolution observations on enrichment processes in the sea-surface microlayer. Sci Rep **8**, 13122 (2018).
<https://doi.org/10.1038/s41598-018-31465-8>

Line 66: The author mentioned recent studies but the citation was from 2017 and 2018. Please add updated citations.

Line 80: How do you define coastal and off-shore regions?

Line 87: Since CDOM highly undergoes photobleaching, correlations to solar radiation and temperature other parameters would therefore be essential.

Line 103: What is the wind speed condition during sampling?

Lines 99-104. I would like to have some more information about how the SML is sampled. For instance, I would like to know whether they made blank measurements of the sampling system and how were those blanks. Information about the instrument's detection limit, or the thickness of the SML that is sampled, would be also appreciated.

Line 350-352: Please add references on how you define wind regime.

Line 350 – 374: How about solar radiation and temperature during sampling conditions? These parameters influence the enrichment of CDOM in SML than wind speed conditions.

Line 350: The author mentioned that the wind speed ranged between 0.2 to 14.9 m/s. However, previous studies only found that the SML only persist at the wind speed of 10 m/s. More recently, surface-active compounds were found to be enriched in the SML at a wind speed of 13 m/s. However, the full integrity of the SML sampled at high wind speeds in this study is concerning because the samples were taken directly from the ship's bow. The distance of the sampling point should be at least 500 m upwind from the vessel to avoid any disturbance of SML integrity produced by the ship's movement and potential contamination.

Line 366: Besides wind mixing, tidal mixing is an important factor, especially in the adjacent coastal water, but the manuscript was never mentioned or discussed. What is tidal type in your concerned Stations? Tidal variation during the sampling period should be investigated at some shallow water Stations.

