

Interactive comment on “Study on organic matter fractions in the surface micro layer in the Baltic Sea by spectrophotometric and spectrofluorometric methods” by Violetta Drozdowska et al.

Anonymous Referee #1

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The authors present an interesting data set on fluorescence and absorption measurements in the sea-surface microlayer. Such measurements are valuable as they are scarce and important to understand light penetration and photochemical processes at the sea surface. Unfortunately the authors do not discuss their results to those important processes at the sea surface.

General comments: More detailed description of sampling methodology, most critical in research on the SML, are needed, and potential impacts on the results (i.e. by collected directly down the vessel's side and rather thick layers). Major data analysis

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to support the conclusions are lacking from the manuscript, and statistics are partly incorrect. Discussion have to be re-written, i.e. in terms of light penetration and photochemical processes, and most importantly with references to the literature. Overall, the manuscripts requires major revision, and also grammar and language editing.

Specific comments:

Page 1 (pls see continous line numbers, thanks) Line 32: Inappropriate references; both are compendiums of different topics to the SML and upper surface processes

Line 34: How about anthropogenic sources?

Page 2 Line 1: " penetration of solar radiation and gas exchange,e.g. the generation of aerosols from the sea surface"...light penetration and gas exchange not directly related to aerosol formation. Confusing sence.

line 9. Most of the surfactants are not fatty acids but carbohydrates and proteins with hydrophobic groups (see also William et al., 1986)

Line24-28: delete or shortened this sentence.

Line 30: SML already defined above. Be consistent with terms, e.g. sea surface microlayer and surface microlayer

Line 36: The authors mentioned here analysis of marine surfactant, but in fact they analyze FDOM/CDOM. Even though some surfactants share properties of CDOM/FDOM, these are two different groups of chemical compounds defined by their hydrophobic properties and light absorption. Please correct

Page 3 Line 5: Sampling the SML is critical due to its thickness of several ten's of micrometer (see Cunliffe et al. 2013). The authors use a particular thick mesh collecting a rather thick layer of 1 mm. The platform used for collecting is also not defined, and I need to assume it has been collected directly from the research vessel. Literature describes collectig SML directly from the SML but I doubt SML with full integrity can

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be collected with this approach. My major concern is that the authors ignore obvious sources of contamination (others than visible oil spills) and disturbance of the SML in the manuscript.

Line 14-17: Move to the section "Results"

Line 27: How about optical interferences of particulates in the samples during analysis?

Page 7 Line 8: "smaller and smaller" is meaningless. Provide numbers and statistics for the decrease as the information is hard to extract from the figure

Line 18: W1 is near-shore, not open sea, correct?

Line 24-25: The authors assume correlation and linear regression is the same. That is incorrect (please refer to textbook for statistics). In statistics, correlation is described as correlation coefficient r , and not as coefficient of determination (r^2 commonly used in regression analysis). Also provide p values to describe the significance of the correlation. Linear regression requires an independent and dependent variable, which is not the case here.

Line 27-38: "the processes go faster in SML than in SS." I don't understand. What processes? Why faster? please explain.

Page 9 Line 14: see above regarding regression vs correlation

Line 16-19: Are the differences significantly different? From figure 6, it seems some of the comparisons of R.U. are not significantly different, but it requires statistical test and p values, which the authors should describe.

Figure 6 and 7: Slightly confusing as in Figure 6 authors grouped SML and SS in a single plot, but in Figure 7 grouped between < 7 PSU and > 7 PSU.

Page 12: Line 16/17: is this statistically different based on a significance level of 95%?

Page 13 - Discussion

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Discussion is short (compared to the Results) and without a single reference to the literature. The authors need to clearly define section Results and Discussion, or combined both if guidelines of the journal allows it. More importantly, the authors need to discuss their results with findings from the literature, e.g. in terms of relevant processes at the sea surface such as light penetration and photochemistry.

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