

Interactive comment on “Changes in optical characteristics of surface microlayers hint to photochemically and microbially-mediated DOM turnover in the upwelling region off Peru” by L. Galgani et al.

Anonymous Referee #2

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The paper describes measurements of the composition of the surface microlayer (SML) in comparison to the underlying water layer (ULW) with respect to DOC concentrations, amino acid composition, marine gels, and CDOM composition for the highly productive Peruvian EBUS region. Measurements of CDOM optical properties (which reveal information about the CDOM composition) are used to investigate processes leading to the accumulation/enrichment of organic material in the SML. These types of measurements are difficult to make and, thus, are sparse. The ones reported here appear to be of high quality and, hence, make a significant contribution to what is currently known

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about interactions between the ULW and SML and DOM processing in the SML, at least for a highly productive region. The paper should be published after the comments listed below have been addressed.

Figure 1. S7 and S12_3 are not shown on the map.

Figure 2. It would be helpful to label the stations shown in the figure so that the reader does not need to go between the text, Figure 1 and Figure 2. Even just putting S10 for all of the S10 sites would help.

Figure 3 caption: The box and whisker plots should be explained in the caption. What are the percentile values for horizontal lines? What do the black circles represent? Are they the individual samples? It would be helpful if these were colored by station number.

Page 19386, lines 7 – 8: It is hard to see that “generally CDOM was enriched in the SML” based on the results shown in Figures 2 and 3. Figure 3 shows a few EF values > than 2 and a few < 1. Based on the text and Figure 2, the higher EFs appear to be associated with regions of terrestrial input or regions of coastal upwelling. The discussion on p. 19386 should reflect this.

Page 19386, lines 19 – 21: Figure 3 indicates two populations of S(275-295) values – one with EFs <1 and the other with EFs >1. Are these not statistically different? If they are, reporting a median EF of 1 is misleading.

Figure 4: Again – it would be helpful if the stations were labeled in the figure.

Page 19388, lines 21 – 24: On average, F2 did not show a clear enrichment in the SML but it did regionally – especially at S2, S10, and the southernmost stations. It is not clear why average EFs are emphasized rather than the regional values – especially since no data points coincide with the median values (as shown in Figure 7).

Page 19393, lines 2-4: Not sure what is meant by this sentence.

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Page 19393, lines 7 – 9: The highest a(325) EFs were observed at S10. Earlier in the paper it is said this may be due to the input of terrestrial material or upwelling. Can anything more be said based on the other reported measurements (F factors, etc.) about the relative importance of terrestrial inputs?

Interactive comment on Biogeosciences Discuss., 12, 19373, 2015.

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