

Interactive comment on “Depth is Relative: The Importance of Depth on TEP in the Near Surface Environment” by Tiera-Brandy Robinson et al.

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Thank you for your comments, we found all your suggestions to be helpful in improving the manuscript.

1. Reviewer Comment: L16- 'a novel small-scale vertical sampler' : In my opinion it would be a valuable add-on to provide a photograph or sketch of the HSV (e.g. in the supplementary material).

Author Response: L16- Oliver looking for HSV picture

2. Reviewer Comment: -L231-232- 'total cell numbers (TCN) and small autotroph profiles': Please provide some more information on the flow cytometry part in the material and methods section. How do you define small autotrophs?

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Author Response: L231-232- The following details have been added: “The total cell numbers (TCN) of prokaryotic and small autotrophic cells were determined by flow cytometry following a modified protocol from Marie et al. (2000). For determination of cell numbers, water samples were fixed with glutaraldehyde (1% final concentration), incubated at room temperature for 1 h, and stored at -18°C until further analysis. Prokaryotic cells were stained with SYBR Green I (2.5 mM final concentration, Molecular Probes, Schwerte, Germany) for 30 min in the dark. Samples were measured on a flow cytometer (C6 FlowCytometer, BD Bioscience, fluorescence accuracy of FITC <75; PE <50), and cells were counted according to side-scattered light and emitted green fluorescence. We used $1.0\ \mu\text{m}$ beads (Fluoresbrite Multifluorescent, Polysciences) as internal reference to monitor the performance of the device. Their cell counts include heterotrophic and photoautotrophic prokaryotes. Pico and nano-autotrophic cells were counted after addition of red fluorescent latex beads (Polysciences, Eppelheim, Germany) and were detected by their signature in a plot of red (FL3) vs. orange (FL2) fluorescence, and red fluorescence vs. side scatter (SSC). We did not further differentiate between different groups of prokaryotic and eukaryotic autotrophs.”

3. Reviewer Comment: -L253- typo/grammar → replace 'has been found'

Author Response: L253: sentence has been changed to “...TEP has been found...”

4. Reviewer Comment: -L259-261: 'this study is the first to. . .' : No it is not. Consider e.g. Zäncker, Cunliff & Engel 2018 Front.Microbiol. Please change this part and consider to incorporate according reference.

Author Response: L259-261: We refer here not to the enrichment in comparison to a single reference depth but to the vertical distribution in the upper 2 meters, i.e. TEP concentrations at 7 depths. Zäncker et al. 2018 measured TEP in the SML relative to 20 cm depth, thus reporting typical enrichment similar to earlier studies and not vertical gradients. To our best knowledge, our manuscript reports for the first time vertical

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gradients of TEP near the ocean's surface.

5. Reviewer Comment: -L275: Do you have any additional data to support that the high enrichment factors in the Cape Verde region are not an artifact due to a different sampling strategy in comparison to the other locations? Did you take for instance any technical replicates using the glass plate technique of Cunliffe and Wurl 2014/Harvey and Burzell 1982 and/or syringe samples on the Norwegian and Baltic Sea cruises?

Author Response: L275: In this study, we did not further compare sampler with rotating glass disks and the glass plate. However, in the study by Shinki et al. (2012) such comparison were made using a similar catamaran with rotating glass disks, and the collected thickness between catamaran and plate samples were comparable. We added the following text to line 277: "While manual sampling techniques were employed in Cape Verde in comparison to rotating glass disc samples in the other campaigns, earlier comparative studies by Shinki et al. (2012) found both methods to collect similar SML thickness and associated biochemical parameters. Since our catamaran was modelled after Shinki et al. (2012) we are therefore able to compare the results from both versions of the glass plate method." Shinki, M., Wendeberg, M., Vagle, S., Cullen, J. T., & Hore, D. K. (2012). Characterization of adsorbed microlayer thickness on an oceanic glass plate sampler. *Limnology and Oceanography: Methods*, 10(10), 728-735.

6. Reviewer Comment: L306- Please provide some more information on the tank experiment. For instance, you could give a short outline in the supplementary material.

Author Response: L306- The following has been added "The tank was made of 10-mm polyvinyl chloride (PVC) plates in a size of 120 cm length × 110 cm width × 100 cm height. The tank had a volume of 1400 L with a 500 L aerosol chamber on top. Materials in contact with seawater were made from TeñÇon, including liners for the wall using Teflon bags."

7. Reviewer Comment: Figures- The numbering of the figures is not corresponding to

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the order in which they occur in the text. For example Fig.1 is appearing very late in the text. Please adjust the order of all figures.

Author Response: Figures- Figure order has been adjusted and now includes the new map as figure 1.

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