

The article, **Parameterization of the spectral light absorption coefficient of phytoplankton in the Baltic Sea: general, monthly and two component variants of approximation formulas** by Justina Meler, presents a way of accounting for the variability in phytoplankton absorption coefficients using an additional term ($\sum C_i/Tchl_a$) in the parameterization. A good attempt, as against the traditional method that takes into account only pigment concentrations. The dataset clearly presents the complexities and challenges, coastal systems have to offer in ocean color remote sensing, wherein regional parameterizations are highly essential. The article is therefore of relevance to the scientific community. However, in its current form it is lengthy (needs to be concise) and contains too many figures. It is therefore requested to perform major revisions (listed below), thoroughly check the text and get it checked from a native speaker.

Major issues:

- In the introduction, relevant background knowledge on how the ratio ($\sum C_i/Tchl_a$) would account for the variability in phytoplankton absorption is missing. Its implications in inferring ecosystem dynamics etc. in different situations. What do high and low values of the ratio imply?
- Parameterizations are developed and tested on the same dataset. How about testing on an independent dataset on an independent dataset (especially when the authors have a huge dataset)? Test the parameterizations on a dataset (from the reported sampling sites, may be set aside data from a year) that was not included in developing the coefficients presented in tables A1, A2 and A3; refer to Mascarenhas et al. 2018 (<http://www.mdpi.com/2072-4292/10/6/977/pdf>)
- A different approach (than the monthly parameterizations) would be considering different ranges of Tchl_a concentration and corresponding values of the ratio ($\sum C_i/Tchl_a$). This will provide an understanding of the effect of concentration ranges (low-medium-high) on parameterization parameters.
- In the introduction, in addition to studies in the Baltic and the Black Sea, consider also those of other ocean basins. For e.g. refer to the following
 - Mascarenhas et al. 2018 Parameterization of Spectral Particulate and Phytoplankton Absorption Coefficients in Sognefjord and Trondheimsfjord
 - Nima et al. 2016 Absorption properties of high-latitude norwegian coastal water
 - Stramska et al 2003 Bio-optical relationships and ocean color algorithms for the north polar region of the Atlantic.

- Matsuoka et al 2007 Bio-optical characteristics of the western arctic ocean: Implications for ocean color algorithms
- Figures could be combined representing the two different parameterization scenarios e.g. Fig 6 and Figures 11 c,d. Less relevant ones could be provided as supplementary material.
- Provide equations of trends in fig 6 and 11c,d.
- Figure captions need to be clearly distinguished from the normal text. Maintain appropriate spacing between the two.
- List out the objectives precisely in points instead of a paragraph.
- All along the article there is a constant effort to explain what this study has to offer in comparison to previously published works (using similar dataset). List out the features and make them clear to the reader in one instance, e.g. at the end of the introduction after listing your objectives or before. Avoid such statements in the methods or the results section.
- Pay attention to the formation of paragraphs (of a consistent size) throughout the article.

Minor issues:

- Watch over differences between British vs American English styles. Check for consistency throughout the article.

Title

Parameterization of the spectral light absorption coefficient of phytoplankton in the Baltic Sea: general, monthly and two component variants of approximation formulas

Instead,

Parameterization of phytoplankton spectral absorption coefficients in the Baltic Sea: general, monthly and two component variants of approximation formulas

Page 1

Line 8: approximate formulas, **empirical equations** instead

Line 12: varied between x and y; be precise no '>'

Line 18-20: sentence not clear, needs to be reframed.

Line 22: to fully describe **the process of** photosynthesis

Line 26: pigments # they contain.

Page 2

Line 1: ...with which their populations absorb sunlight (**References???**)

Line 3: **of all these** relationships

Line 15: They proposedpower function (provide the equation)

Line 20: empirical **data**, instead of empirical material

Line 20: '**case 1**' instead of "case 1" (single quote marks, also elsewhere in the manuscript)

Line 21: contents in enclosed parenthesis (chlorophyll a concentration ranging from 0.02 to 25mg m⁻³)

Line 27: concentration **ranging** from

Line 33: A more recent paper, Mascarenhas et al. 2018

Page 3

Line 16: 9 years or 10

Lines 22-31: instead of the paragraph, list the objectives as

Line 28: if possible???. This should be clear by now!

Page 4

Figure 1 caption:, **enlarged view of the enclosed area.**

Page 5

Lines 3 to 6: Authors attempt to emphasize differences in comparison to previously published works. This could be done at the end of section in brief. Not here and there or in the beginning of the section.

Line 13: pore size of GF/F

Line 15: kept ~~deep~~ frozen

Page 6

Structure the paragraphs appropriately

Page 7

statistical formulas could be avoided, will help keep the length reasonable.

Page 8

Line 4: **at** selected wavelengths

Page 9

Line 5:**and their ratio to Tchl_a**

Page 14

Figure 5 a,c: provide detailed legends for every spectra

Page 15

Figure 6: (see the ~~caption~~ legend to in panel (b))

Page 19

Line 1: ~~Example of a~~ Two component parameterization

Line 2: (~~see also~~ Figure 3)

Line 5: As a step towards improving....

Page 24

Line 5: check the percentages

Page 25

Line 2: now we shall.....with those of **cite them here directly**

Page 29

Line 3: Importantly, **when** matched.....

Page 30

Line 1: seawater **optical** components