

Interactive comment on “Parameterization of the light absorption properties of chromophoric dissolved organic matter in the Baltic Sea and Pomeranian Lakes” by Justyna Meler et al.

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General comments

An interesting work in which a lot of effort for sampling, analysis and modeling has gone. The motivation for this work is not quite clear. Advantages should be more highlighted, combined with future prospects for its application.

Reply: We would like to thank Reviewer 2 for appreciation of our work. We will make effort to explain our motivation and implication of our research and proposed model in the broad context of the possible application in remote sensing, biogeochemistry and carbon cycle studies in enclosed marine basins and estuaries and fresh water

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lakes. The Reviewer #1 has similar remark therefore we have added a short paragraph in Introduction that fit our research in the broader aspects of applied environmental studies. Proposed new paragraph and references is included below:

“The CDOM absorption coefficient is very reliable predictor of the dissolved organic carbon concentration in fresh and estuarine waters (Brezonik et al., 2015; Kutser et al., 2015; Tomig et al., 2016). The new ocean color operational satellite missions like the Sentinel-3 OLCI mission and space sensors of the European Earth Observation Copernicus program and the VIIRS sensors of the US Joint Polar Satellite System program offered the medium ground resolution (in order of 250 m), which would be suitable for remote sensing observation of inland water bodies (Palmer et al., 2015; Kwiatkowska, et al, 2016). The optical properties of CDOM, abundant in fresh and estuarine waters at high concentrations, shift the spectral maximum of the water transparency to solar radiation and water leaving radiance toward the longer wavelength (Darecki et al., 2003; Morel and Gentili, 2009). In extreme cases, in humic boreal lakes, the CDOM reduces the water leaving radiance intensity in the visible spectrum almost to null (Ficek et al., 2011; Ficek et al., 2012; Ylöstalo et al., 2014). To minimize this effect, the remote sensing algorithm for retrievals of the bio-optical and biogeochemical variables in optically complex waters were based on spectral bands combinations at longer wavelengths where CDOM absorption is low (e.g. Ficek et al., 2011). Therefore, there is a need for development of models that would enable to reconstruct the complete CDOM absorption spectrum. The detailed spectral information of CDOM absorption is required for example to calculate the spectral indices related to molecular weight, degree of photochemical transformation (Helms, et al., 2008) or aromaticity (Weishaar et al., 2003).

The references list has been updated with those cited in this paragraph.

Specific comments

Some structures should be revised, especially the discussion. Argumentation is often

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difficult to follow. Short and concise sentences might be easier. A little bit mixed up with other chapters, especially results. Reply: The revised manuscript structure will thoroughly corrected in terms of used argumentation and clarity. The whole manuscript will be edited to clarify the English usage, grammar and style. Fig 10 could be arranged according to chlorophyll a concentrations. Reply: It has been amended.

To clarify and support statements add numbers (i), (ii), especially in the discussion section.

Reply: This remark is similar to comment by Reviewer #1. We will make effort during manuscript revision to make our statements clear, and to assess the model performances on objective arguments.

Technical comments

The language should be revised prior to publication. Reply: As we already stated the revised manuscript will corrected by professional English editor.

Sentences are often too long, resulting in confusion.

Reply: The English usage, grammar and style will be corrected by professional English editor.

Formulas should be consistent; the same goes for the description of existing parameters. Symbols and abbreviation are used inconsistently in manuscript, e.g. chl a, CDOM. This should be revised prior to publication.

Reply: It has been amended.

Lines 175ff: Add reference.

Reply: It has been amended.

Line 182ff: Eq 4: At which wavelength was it calculated?

Reply: It has been amended.

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Line 203-212: not consistent with others, try to rearrange. Reply: It has been amended.

Interactive comment on Ocean Sci. Discuss., doi:10.5194/os-2016-34, 2016.

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