

# ***Interactive comment on “Use of absorption optical indices to assess seasonal variability of dissolved organic matter in amazon floodplain lakes” by Maria Paula da Silva et al.***

## **Anonymous Referee #1**

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## Major comments

The authors measured CDOM parameters, i.e., aCDOM(440) and S275-295, of water samples collected from four lakes located at the Mamirauá Sustainable Development, Brazil. The lakes have different geographical settings: two of them are isolated perennial lakes surrounded by flood forests, while the others are lakes connected to the Japurá river. The authors found that levels of aCDOM(440) and values of S275-295 were different between rising and receding periods for the former lakes but not for the latter lakes. The authors found a power trend between aCDOM(440) and S275-295 for all lakes during the receding periods and concluded that S275-295 can be estimated

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from aCDOM(440) during the receding periods. Additionally, the authors established a model to estimate aCDOM(440) from Rrs determined in situ by optical sensors. From these results, the authors concluded that “The empirical model relating Rrs and aCDOM (440); aCDOM(440) and S275-295 provided robust statistics indicating the high potential of MSI sensor for estimating S275-295 during the rising water.”

I think the measurements and data analyses in the manuscript were mostly reasonable. However, I could not understand why estimation of S275-295 from Rrs through the relationships with aCDOM(440) was necessary, because the motivation regarding with estimation of S275-295 from Rrs was not described/discussed. The authors referred papers by Fichot et al. (2003) and Vantrepott et al. (2015). Fichot et al. used S275-295 for a tracer of terrestrial DOM in the Arctic Ocean. Vantrepott et al. used S275-295 as a proxy of ratio of aCDOM to DOC. These previous studies, therefore, clearly mentioned the necessity to estimate the S275-295, in addition to and/or instead of aCDOM, from Rrs. However, in the manuscript, it seemed that the authors estimated S275-295 without clear purpose/motivation. The relationship between S275-295 and aCDOM(440) indicates that possible interpretation about environmental dynamics of CDOM by S275-295 estimated from aCDOM(440) and Rrs are the same with that by aCDOM(440) estimated from Rrs. In other words, the second main objectives of this study “compute S275-295 to examine its potential for distinguishing differences in DOM by comparing them in those two hydrograph phases” can be achieved only from aCDOM(440) without estimation of S275-295 from aCDOM(440). Thus, I think the estimation of S275-295 from aCDOM(440) is not necessary for this study. I think the comparison of aCDOM(440) estimated from Sentinel/MSI imagery and those from in situ measurements, rather than estimation of S275-295 from aCDOM(440), is much important and informative, even though the discussion about the observed relationship between S275-295 and aCDOM(440) is necessary.

Minor comments

Line 15: Please do not use abbreviation (MSI) for the first use.

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Lines 46-48: I could not understand how Vantrepott et al. (2015) circumvent assumptions in Fichot et al. (2013), namely CDOM optical dominance in water and co-variation between CDOM and other particulate matter. Please explain the circumventor in detail with more logical manner.

Line 84: Please add more explanations about the methods by Mobley (1999) and Jorge et al. (2017b) for readers' convenience.

Line 93: How long the authors kept samples in the refrigerator?

Line 98:  $\lambda(\text{ref})$  and  $\lambda(0)$  are usually the same in the equation described in spectral slope parameter (e.g., Bricaud et al., 1981).

Line 122: Line 84: Please add more explanations about the methods by Vantrepott et al. (2015) for readers' convenience.

Line 145: "cw" should be defined before use of the abbreviation.

Figure 2: It seemed that Figure 2 was not appeared (referred) in the text.

Figure 4: In addition to present Figure 4, addition of a figure having log scale of absorption coefficients on Y-axis may help readers' understanding.

Figure 5: I could not understand how the authors averaged the data. Please explain it.

Line 184: I could not understand the meaning of "high relationship". Please rephrase it.

Lines 213-220: I basically agree with the authors' discussion about differences in behaviors of CDOM parameters with rising/receding of the water between two types of the lakes. However, it may be possible to explain that the deviated behaviors observed in Buabuá and Mamirauá during the receding periods were simply due to the contribution of water from the Solimões River in which CDOM characteristics are largely different from the Japurá River and around the study region. Figure 1 clearly showed that colors, possibly affected by CDOM and particles, were largely different between

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the Solimões River and the Japurá River. Thus, I think it's better to explain/discuss possible differences in CDOM parameters between two rivers and possible effects by the rivers, in particular the Solimões River, to CDOM parameters in the lakes during the rising/receding periods. In addition, it's better to discuss why CDOM parameters in the lakes affected by the Japurá River were not changed during the rising period.

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