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Biogeosciences Discussions

Interactive comment on "Reproducible determination of dissolved organic matter photosensitivity" *by* Alec W. Armstrong et al.

Anonymous Referee #2

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Overall comment: The study described in the manuscript aims to obtain a generalized method for studying light sensitivity of DOM in different water bodies. Authors suggest that this method may provide additional information on natural DOM quality. In general, I find this approach novel, however, some aspects are missing that would make me believe the method worse trying. The method seems to be very complicated and affected by numerous factors that the reader should keep in mind, but the discussion on the advantages of this method is very abstractive.

Specific comments: I have several more specific comments to the manuscript: Authors mentioned by themselves that pH changes might lead to reactions of flocculation, furthermore, pH may greatly affect EEM and absorbance signals which measured in this study, herewith I have a question, why did the Authors acidify the sample prior to ex-

tractions. And why did they use GFFs rather than 0.2 μm membrane filters? In my understanding, the colloidal fraction of DOM that is most likely to be present in the sample after 0.7μm filtration is the most susceptible to flocculation. The authors mentioned that natural samples were affected by cold storage. How exactly the sensitivity study was performed? The authors did a comparison study for a humic standard comparing extracted and not extracted solutions and saw a difference in the quality of DOM on EEM. Since quite altered by isolation and freeze-drying standard differ between extracting and non-extracting approach, the question is how would the natural samples differ? To which extent those extracts would be representative of what is actually going on in-situ? Also, the extracts were evaporated and diluted, what method was used for that? Microwave? The Authors describe precisely in details different approaches and drawbacks for the standard humic substance but the methods are lucking the description of the experiments performed on natural water samples. For instance, the reader learns that the natural organic matter was collected in different seasons only in the section "Results and discussion" and so on. Have the authors measured the initial conditions sample in each water bodies? How did EEM differ in terms of Fmax scores? Were they different? Also, for different seasons? I would expect that the Fmax scores would indicate that the composition of DOM is different between those water bodies, therefore I wonder whether the reported method would provide greater advantages than the outcome that DOM between water bodies is different? If the question is rather on the photosensitivity, in my opinion, some kind of discussion should be present on how comparable the results will be to what may happen in situ.

Technical corrections: Fig.9 Two plots for Comp3 For EEM comp. decay there are 4 curves for shallow and deep wetlands, were those replicates, or those different seasons measurements the authors have mentioned in the last chapter?

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