

## ***Interactive comment on “Seasonal characterization of CDOM for lakes in semi-arid regions of Northeast China using excitation-emission matrices fluorescence and parallel factor analysis (EEM-PARAFAC)” by Y. Zhao et al.***

**Anonymous Referee #2**

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Overall: the language needs corrections, additional check and corrections by native speaker would be advised. Authors should more careful interpreting the components. And there are way too many methodological details in the manuscript.

Abstract The abstract should be written in more concise way. Right now it is quite confusing. Only the most important findings should be emphasized (which is not the case now). The less important findings should be removed from abstract. I do not

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really understand what authors mean by the sentence line 14-15?

Introduction: In general the introduction is too long, it should be shortened. Page 5727, line 10: reformulate “terrestrial imported substance” Too many technical details in the introduction: (page 5727, line 22-28). It is not necessary to describe it. There are repetitions. For example it is not necessary to introduce the two main components twice (page 5727, line 20 and 5728, line 17). Page 5729, line 11: I did not understand what was the actual motivation to perform this research? The novelty of this research has to be emphasized.

Materials and Methods

Overall too long, way too many methodological details. However I am missing the description of absorption coefficients? Which ones did authors calculate? What these absorption coefficients indicate?

Why these lakes were sampled during these four times? (page 5730, line line 11) To obtain information about seasonal changes, rainfall, dry season or what was the reason behind it?

Not necessary to explain the unit (page 5730, line 19)

In the section “2.3 DOC concentration measurement”, the citation of the method is missing.

In section “2.6 The PARAFAC modelling” it is not necessary to describe PARAFAC model, appropriate citations would be enough. This PARAFAC section should be shortened significantly.

Section “2.7 Statistical analysis” Page 5734, line 18 and 19: correct “analyses” to “analysis” Did the authors check if the data were distributed normally? If not, then t-test can't be applied.

Results and discussion

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Overall: too many methodological details, too little of actual discussion.

“3.1 Water quality conditions” Why do authors pool all the samples together? It would be important to show the differences between fresh and saline lakes during different seasons. Page 5735, line 8 “salinity with other three seasons” should be reformulated Repetition of word “reduced” (page 5735, line 10)

Section “3.2 EEMs characterization of CDOM” Again too many methodological details, they should be removed.

Page 5735 line 20: reformulate “While the two protein-like components consist of two dissolved amino acids, i.e., tryptophan and tyrosine that are originated from microbial...” One component is tyrosine-like only and another is tryptophan-like only, not both.

It is not necessary to provide the Ex/Em of each component again (page 5735, line 24-26). The description of the components was already provided before by the authors, it is repetitive here. Page 5736, line 1-2. This sentence should be reformulated “The measured peak intensity of these fluorescence centers is dependent on the concentration of the main fluorophores dissolved in water bodies”. Page 5736, line 3-15: this part belongs rather to the method section

Section 3.3 “Temporal distribution of the PARAFAC components” and section 3.4 “CDOM vs. EEM-PARAFAC extracted components”

Overall: The general patterns and only the main findings of the results should be just emphasized. These two sections should be re-written, otherwise the reader is lost. And discussion of the results should be more extensive.

Page 5737, line 8: Why would authors pool the results from all the samples together? Again, I think it would be good to show the differences between different types of lakes, seasons or flood and no flood samples. However there are too many results, describing just patterns (increase, decrease). These two sections should be shortened and only main findings emphasized. For me as a reader, the most important results and findings

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are not clearly stated. Page 5738, line 9: “protein-like peaks” should be replaced “protein-like components” Page 5738, line 14: “reached to “ should be replaced by “reached” Page 5739, line 1: “quantities of rainfall taking place” should be reformulated Page 5740, line 1: what are “common sources” ?

Conclusions: Overall: The language needs corrections. Some sentences need to be reformulated. There are too many results here, the main findings need to be synthesized.

Page 5741 line 1, 2, 5 Authors should use “components” rather than “peaks” Page 5741 line 4-6 The sentence “The lowest C2 represents only a small portion of CDOM from terrestrial import to water bodies through rainwash and soil leaching” should be reformulated Page 5741 line 6: “intensities” change to “components”

Figures: Figure 2. What is the purpose of presenting figure of this one specific sample?

Figure 5. It would be good to present seasonal variations of Fmax of each component in the separate figures. Right now there is too much information in one figure. Also it would be interesting to see if there was any correlation between rainfall and any of the components?

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