

## ***Interactive comment on “Characterization of chromophoric dissolved organic matter in lakes on the Tibet Plateau, China, using spectroscopic analysis” by Kaishan Song et al.***

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This manuscript describes a study on characterization of colored dissolved organic matter (CDOM) of 63 lakes across the Tibet Plateau. These 63 lakes were divided into brackish and fresh groups, and the differences between these two groups of lakes in water quality and CDOM absorption and fluorescence were addressed using CDOM optical absorption and fluorescence, and the selected absorption and fluorescence indices. PCA was applied to the normalized excitation-emission matrix (EEM) and fluorescence regional integration (FRI) to investigate how brackish and fresh water samples are different/correlated and RDA to CDOM optical absorption and fluorescence

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signals or derived indices for their correlation to water quality parameters, particularly to CDOM. At last, the effects of salinity, solar radiation and land cover on the fate of CDOM in these brackish and fresh lakes are elaborated. The most obvious strength of this work is its large size of water samples collected from representative lakes in the Tibet Plateau as well as its focus on how solar radiation has impacts on the decomposition of CDOM these brackish and fresh lakes. The work is well done, the result is solid and expected to draw much attention from scientists in this area after being published. This reviewer also feels that there is room for this manuscript to be improved, and the following general comments should well serve for this suggested improvement. Meanwhile, specific comments from this reviewer can be found in the annotated manuscript. 1) Introduction: the listed objectives are too broad and some of them were not fully achieved (e.g. objective 4) or not at all (objective 2). The acronym should be used consistently and explained when first used, e.g. FDOM vs. FCDOM. 2) The overview of lakes in the Tibet Plateau is too general to be as helpful as it should be. This overview should focus more on how the solar radiation received by the lake in the Tibet Plateau differs from those in low elevation regions of China, and how the elevation range of these lakes looks like. It is too late that elevation is described in section 3.1. 3) In the method and material section, some symbols are present abruptly without giving sufficient background e.g. SUVA, S, M, and HIX. Some indices are fully described, but the description is mingled with that of spectral measurement, e.g. FI. Field sampling and lab measurement should be described separately, e.g. section 2.2. 4) Section 2.7 is weak, correlation analysis of EEM-FRI and regression mentioned in the result section should be briefly mentioned. The description of PCA and RDA should be provided, including what variables these methods were applied against, why PCA and RDA were used and what outputs were generated. Was PCA based on the variance-covariance or correlation matrix of EEM-FRI? 5) The result section is a bit long, some sentences should be placed in the method section and others should be in the discussion section. The description in this section should be straightly focused on the results, and the following order of the description could

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be considered when the authors revise the manuscript: Water quality parameters, CDOM absorption, fluorescence indices, EEM-FRI and its correlation analysis, PCA of EEM-FRI, and RDA of CDOM absorption and fluorescence parameters along with water quality parameters. 6) The discussion may just focus on the effects of salinity and solar radiation. The effect of land cover is relevant but it is not as important as the effects of salinity and solar radiation. 7) The conclusion section should summary the major findings which are supported by the results and in line with the research objectives stated in the introduction section. Obviously, the conclusion section needs more effort to improve. 8) As above mentioned, some specific comments relevant to the general comments can be found in the annotated manuscript along with some editorial comments. Most importantly, the language of this manuscript needs to be improved, particularly a lot of repeated and similar statements take too much space.

Please also note the supplement to this comment:

<https://www.biogeosciences-discuss.net/bg-2018-259/bg-2018-259-RC1-supplement.pdf>

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