

Second review of the manuscript number: TC-2018-122

Specific comments

Page 2: Please use $a_{\text{CDOM}}(280)$ instead of $a(280)$. The latter is often used for total absorption. Please change everywhere in the text.

Page 3: from the in-situ microbial processes (autochthonous) (Anesio et al., 2009) -> from in-situ processes (autochthonous) such as microbial activity (Anesio et al., 2009)

Page 5: methods of characterizing -> methods for characterizing

Page 6: the samples were subjected -> the samples were characterized

Page 7:

the spatial variations of CDOM optical properties

Only the spatial variability of CDOM was studied? What about FDOM that was previously discussed?

Page 8: Although the previous studies -> Although previous studies

Page 9:

After PARAFAC analysis, the EEMs can be decomposed into several components with clear chemical interpretations.

This sentence is misleading. The PARAFAC analysis is used to do the decomposition.

Page 11:

was determined both by a linear fit and an exponential fit.

Why have you used two fitting approaches?

Page: 12:

Finally, linear fit was adopted due to the higher fitting coefficients.

This is not a valid reason to chose the linear approach. Also, do not talk about the non-linear method (and the equation of it) if you are not using it in the paper.

Page 14:

Finally, the unweighted average method was chosen due to the highest correlation coefficients.

It is a bit strange to select an approach just because it gives the highest correlation.

Page 16:

which shows the similar values

should be “which shows the similar values”. There are many small errors like this in the manuscript. A careful revision of English writing should be done.

Page 27:

As presented by Doherty et al. (2013), the mixing ratio of BC in Barrow snow ranged from 10-30 ng g⁻¹. Hence, the absorption of CDOM in Alaskan snow can be safely ignored, but this does not appear reasonable for some areas across northwestern China.

I do not understand. What is the relational for saying that because BC ranged from between 10-30 ng, CDOM in the Alaskan can be *safely* ignored?

Figure 11: Only one sentence is presenting the result of this figure on page 27. Can you discuss that? Why have you specifically chosen 400 and 500 nm? What could possibly explain the observed differences among sites?

Table 1: Why some observations have a value for a280 but not for the spectral slope?

The authors use *Fig.* and *Figure". Please uniformize in the manuscript.