

## ***Interactive comment on “A systematic examination of the relationships between CDOM and DOC in inland waters in China” by Kaishan Song et al.***

**C. Stamm (Editor)**

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Received and published: 15 May 2017

Editor comment

HESSD-Manuscript “**A systematic examination of the relationships between CDOM and DOC in inland waters in China**” (HESS 2017-179).

Dear Dr. Y. Song

Reading through the manuscript, I came across a number of aspects on which I'd like

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to comment on during this discussion phase.

### **Comments on content:**

**L. 70 - 75:** Provide explanations on mechanisms how hydrology affects DOC and CDOM properties. Why shall catchment size *per se* be important? Can you explain why size is influential apart from affecting for example travel times?

**L. 316:** If you know about these influencing factors, why you cannot derive an explanatory model for the slope?

**L. 345 - 347:** Again, you should explain how hydrology and catchment characteristics can influence CDOM and DOC.

**L. 350 - 357, Fig. 4:** This part is highly misleading because the text evokes the impression that you compare DOC and CDOM to simultaneous measurements of discharge. Unfortunately, this is not the case. You write in the manuscript that the hydrographs correspond to long term averages and do not represent the actual flow conditions during the periods of your sampling campaign. However, you do not pay attention to that basic fact when displaying the data: By plotting discharge and concentrations against the same time axis (Fig. 4) you give the impression that a flow rate value on day X is linked to the concentrations for the same day. However, this is not true. Therefore, this way of presenting and interpreting the data is not acceptable. Such figures would only be correct if you can provide the discharge data from the years of sampling.

Should it not be possible to get access to this data, you have to adapt you data analysis accordingly. Because you neither have information about the actual flow for a given sampling date nor about the actual sequence of actual discharge from day to day you should not plot the data against the time axis. Instead you plot for

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example the concentrations against a selected quantile of flow rates for the corresponding Julian day. This would also be more to the point because you argue that there is a relationship between flow rate and DOC/CDOM concentrations irrespective of the Julian day.

- L. 425 - 426, Fig. 3, Fig. 6:** The data sets in the two figures seem not be fully consistent. When comparing for example Fig. 3d and 6d, there are 3 – 4 data points with DOC concentrations of 80 – 120 mg L<sup>-1</sup> in Fig. 3d that are absent in Fig. 6d. How does it come? The same holds in the opposite direction with data of about 45 mg L<sup>-1</sup> in Fig. 6c. What is the explanation?
- L. 451:** I cannot see this low M values in Fig. 7B. Can you support your statement by a statistical metric?
- L. 462:** Your selection of categories for M is rather arbitrary. Additionally, when looking at them in their entirety, it is obvious that there is a general pattern in that the slope decreases with increasing M (see figure in the attachment). Hence, the slope simultaneously depends on DOC and M. Because M is simply the ratio between  $a_{CDOM250}$  and  $a_{CDOM365}$ , it follows that  $a_{CDOM275}$  is a function of DOC,  $a_{CDOM250}$ , and  $a_{CDOM365}$ . Instead of introducing first M and then classify M into categories, you better directly express  $a_{CDOM275}$  as a function of these three variables. This would make also any relationship that you find much easier to interpret.
- L. 489 - 491:** This is confusing: In Fig. 8 you try to demonstrate that the  $a_{CDOM275}$  - DOC relationship depends on M, here you argue that one regression model is sufficient. Can you elaborate on this (apparent) contradiction?

**Minor aspects (style, wording etc.):**

- L. 12:** Has this algorithm been developed previously? Clarify.

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**L. 58:** Replace *acted by* by *considered*.

**L. 60 - 61:** Is this not trivial? What other sources exist?

**L. 77:** CDOM is not a single substance.

**L. 110:** What is the particular link between urban water sources and saline lakes?

**L. 168:** Why don't you provide this information for river samples?

**L. 219:** I assume *changed* should be replaced by *ranged*.

**L. 258:** Replace *in* by *during the*.

**L. 599 – 619:** The references are not in the correct alphabetic order.

**L. 643:** The reference is not in the correct alphabetic order.

**Fig. 1:** Please explain what do you mean by *Hydrological features*.

Christian Stamm