

Interactive comment on “Tracing the transport of colored dissolved organic matter in water masses of the Southern Beaufort Sea: relationship with hydrographic characteristics” by A. Matsuoka et al.

Anonymous Referee #1

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The study provides novel data on CDOM in the western Arctic Ocean and uses an optical approach to characterize CDOM samples into 6 water masses. The description of water masses in the southern Beaufort Sea is well written and well supported by Table 1 and Figure 2.

Results Page 11012/11013 “. . .except for some stations where waters were influenced by sea ice melt (dotted circle in Fig. 5a)”: the a_{440} values were clearly lower for some stations but what’s about the spectral slope? How did they compare with those in surrounding waters? Same for DOC data.

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Page 11013 “the river plume extended farther offshore in the western channel than in the eastern channel, . . .” I think the manuscript would benefit if the authors would include a comparison of their results to these other recent publications in the field. For example, Retamal et al (2007) found high CDOM absorption more than 50 km offshore over the Mackenzie shelf. How does it compare with the data presented here?

Page 11015 “Our zero-salinity DOC values were significantly lower than in the Eastern Arctic Ocean ($p < 0.0001$; Amon, 2004).” The zero-salinity DOC value ($\sim 500 \mu\text{M}$) agrees well with DOC data found in previous studies (e.g. Osburn et al., 2009). The authors however should comment why their estimate is far below that found in the eastern Arctic Ocean.

Page 11015 “97% of DOC variability is explained by that in the colored fraction of DOM”: The authors should compare this important result to this other recent papers.

Page 11017 Aagaard et al. instead of “Aaggaard et al.”

Discussion Page 11016 “While CDOM absorption was measured onboard immediately after water sampling in this study, the measurements were achieved a few months after sampling in Belanger et al. (2006) on frozen water samples. The difference in the slope for $a_{\text{CDOM}(440)}$ versus salinity relationship could partly result from change in CDOM absorption properties over time.” High CDOM samples are especially susceptible to loss of CDOM optical properties from freezing rather than time.

Appendix A1: The authors tested whether there was a significant difference in CDOM absorption of surface waters between samples from the barge and from the CTD/Niskin. It is not clear if the p-value given here corresponded to the linear regression line or slope. Please clarify.

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