

Interactive comment on “Light absorption and partitioning in Arctic Ocean surface waters: impact of multi year ice melting” by S. Bélanger et al.

Anonymous Referee #2

Received and published: 22 May 2013

Light absorption and partitioning in the Arctic Ocean surface waters: impact of multi year ice melting S Belanger et al. General Comments: The paper investigates light absorption properties and the vertical variability of light absorbing components in the southeastern Beaufort Sea. Stations sampled include regions influenced by the Mackenzie river and the polar mixed layer waters. An important outcome of the study presented was that the melting multi-year ice was found to release significant amount of non-algal particulates near the sea surface relative to sub-surface waters. The impact of this process on the light transmission and remote sensing reflectance (Rrs) was examined using the Hydrolight radiative transfer model. Modeling studies suggest that the non-homogeneous surface distribution of non-algal particulate matter can signifi-

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cantly affect the Rrs in the blue-green spectral region. The results presented in this study are novel that suggest this area of research this to be considered in future studies. This is a well-written manuscript and is recommended for publication with some minor recommendations.

Specific comments: i) The study suggests that the ice-melt waters have not been subjected to any mixing/turbulence or the waters have undergone ice-melt within relatively short period before sampling. It would be interesting to show the wind conditions before and during the sampling of the surface waters. ii) The results of the absorption properties of CDOM at the same stations were presented in a previous paper by Matsuoka et al. 2011. A comparison of CDOM in Figure 4 to that of Figure 6 in Matsuoka et al. 2011 show different patterns for the western and the eastern vertical transects. Reason for this could be due to the different scales used for the figures. Would suggest that the same scales/depths be used so that the two papers can be studied seamlessly. iii) Overall the figures are of good quality, however Figures 1, 10b and 11 are not clear and could be improved with better color contrast or enlargement. iv) Please correct subtitle “3.3 Particles enrichment the near the sea surface”

Reference: Matsuoka, A., Bricaud, A., Benner, R., Para, J., Sempe ÌÀre ÌÀ, R., Prieur, L., Be ÌÀlanger, S., and Babin, M.: Tracing the transport of colored dissolved organic matter in water masses of the Southern Beaufort Sea: relationship with hydrographic characteristics, Biogeosciences, 9, 925–940, doi:10.5194/bg-9-925-2012, 2012. 5623, 5629, 5630

Interactive comment on Biogeosciences Discuss., 10, 5619, 2013.

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