Monday, October 8
Poster Session 1
16:00–18:00

Poster 264

DISSOLVED ORGANIC MATTER COMPOSITION IN ARCTIC DRIFT ICE AND SURFACE WATERS NORTH OF SVALBARD ON THE ONSET OF MELT SEASON

We investigated spectral properties of dissolved organic matter (DOM) absorption and fluorescence properties in the drift sea ice and open waters in spring 2015, north of Svalbard – during the "TRANSSIZ" expedition (on board of the FS Polarstern). The PARAFAC model was derived to assess the DOM composition based on measured Excitation-Emission Matrix spectra (EEM). The four-component PARAFAC model has been successfully validated. The PAPRAFAC model identified one protein-like component (C1) and three humic-like components (C2-C4). The DOM fluorescence intensity in open waters was lowest and the humic components dominated the DOM composition. The total fluorescence Itot increased in under ice water by 33.3% compared to open waters but not significant changes in DOM composition were observed. The DOM fluoresces intensity in the ice bottom layer was 26.6 and 68.9% higher compared to UIW and OW, respectively. The fluorescence DOM intensity in the ice cores was lowest in its middle layer. We have observed a significant change in DOM composition in the sea ice. The fluorescence intensity of protein-like component C1 was 1.5 times higher than a sum of fluoresce intensity of remaining humic-like components C2-C4. We have also observed a significant correlation of fluorescence intensity of protein-like component C1 and chlorophyll a concentration in the sea ice indicating in situ production of organic matter. The spectral indices: the ratio between fluorescence intensity of identified protein-like components to humic-like components, Ip/Ih and SUVA(254) were highest in the sea ice bottom layer, while humification index, HIX, values were found lowest there.

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