Wednesday, October 10
Poster Session 3
16:00–18:00

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**Poster 226**

## ASSESSING THE INFLUENCE OF OPTICALLY ACTIVE CONSTITUENTS ON THE RADIATIVE HEATING OF LAPTEV SEA SURFACE WATERS

Studies have shown that the high concentration of colored dissolved organic matter (CDOM) in Arctic waters increase the energy absorbed in the mixed layer and potentially contributes to sea ice melt. Here, we investigate the effect of changes in the water optically active constituents on the heat budget of the Laptev Sea surface waters. This region is heavily influenced by the Lena river; the second largest river discharge into the Arctic Ocean, carrying high loads of CDOM and suspended matter. We simulate the radiative heating by using coupled atmosphere-ocean radiative transfer modelling and in situ measurements of CDOM absorption (aCDOM(443)), total suspended matter (TSM) and chlorophyll concentration (Chla) from the TRANSDRIFT XVII expedition during August-September of 2010. Results showed that at the highest CDOM station (aCDOM(443) = 1.77 $m^{-1}$) 5% more energy was absorbed in the surface layer (upper 5 m) compared to the lowest CDOM station (0.2 $m^{-1}$), which translates to an increased heating rate of about 0.24°C/h. In contrast, the highest TSM (TSM = 7.2 g/l) led to an increase of 2.1% in the absorbed energy and 0.1°C/h in the heating rate compared to the lowesr TSM station (0.04 g/l). We further investigate the implications of the optical contribution of CDOM and TSM on surface heating and ice melt. In addition, using satellite remote sensing data of aCDOM(443), TSM, Chla and sea surface temperature as input to RTM, we present the spatial distribution of radiative heating of Laptev Sea surface waters for a typical summer day.

**Mariana Soppa,** Alfred Wegener Institute, msoppa@awi.de
Vasileios Pefanis, Alfred Wegener Institute, Vasileios.Pefanis@awi.de
Sebastian Hellmann, ETH Zurich, sebastian.hellmann@erdw.ethz.ch
Jens Hölemann, Alfred Wegener Institute, Jens.Hoelemann@awi.de
Markus A. Janout, Alfred Wegener Institute, Markus.Janout@awi.de
Fedor Martynov, Arctic and Antarctic Research Institute, fedor.martynov@gmail.com
Birgit Heim, Alfred Wegener Institute, Birgit.Heim@awi.de
Vladimir Rozanov, Institute for Environmental Physics, University Bremen, rozanov@iup.physik.uni-bremen.de
Svetlana Loza, Alfred Wegener Institute, Svetlana.Loza@awi.de
Tilman Dinter, Alfred Wegener Institute, Tilman.Dinter@awi.de
Astrid Bracher, Alfred Wegener Institute, abracher@awi.de