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

Poster 91

CONTRIBUTION OF LOCAL RADIATIVE FORCING ON ARCTIC SEASONAL SEA ICE MELT

A series of buoys have been deployed on Arctic seasonal sea ice of thickness 1.0 – 1.5 m to investigate the contribution of local radiative forcing to ice melt. WARM buoys that measure incident and transmitted light as well as temperature within the sea ice and upper water column were co-located with ice mass balance buoys that measure ice thickness, and temperature at high vertical resolution (10 cm) through the ice. At the cluster deployed in March of 2017 in the Canada Basin sea ice melt of approximately 4 cm per day was observed throughout June and July, linked with a rapid increase in cumulative energy absorption within and beneath the ice. Transmission of solar energy intensified at the beginning of June with radiative flux to the underside of the ice increasing from 5 to 25 W m^{-2} between June 5th and 21st. A total of 10 MJ m^{-2} was deposited during this period, a 47% increase in energy storage. Melt ponds were observed on the surface of the ice starting June 21st, 11 days after the initial increase in light transmission. Over the next 16 days the ice thickness reduced from 1.8 to 0.86 m with 31 MJ m^{-2} of energy deposited by July 7th, and a further 26 MJ m^{-2} by July 24th when the ice had largely melted. These data inform the partitioning of radiative heat input and basal ice melting rates.

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