



Differential sea ice bottom melt rate during late summer in the Chukchi Borderland region

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In 2011 summer four sea ice mass balance buoys were deployed in the Chukchi Borderland region. Even though the buoys drifted together within less than 100 km range, measurements from the buoys exhibit quite a different bottom ice melt rates, ranging from less than 1 cm per day up to 5 cm per day. This was equivalent to less than half meter or up to 0.76 m of total bottom ice melt during about a month in August. The intensive melt rate was associated with warmer water temperature (about -0.9 to 0.5°C). Our results also showed cumulative solar heat input between intensive and moderate melting was different by $50\text{-}80 \text{ MJ}\times\text{m}^{-2}$, confirming significant role of solar heating for the differential bottom melt rates. The effects of longwave and turbulent fluxes and sea ice drift divergence on sea ice melt are also discussed.