

Abstract Preview - Step 3/4

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Session: OS-3 Sea ice extent, properties, volume & ice shelves: modern and paleo records

Polar program: None

Title: Sea ice thickness estimates from Icebridge over the Weddell Sea in 2009-2016

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Text: NASA's Operation IceBridge (OIB) aircraft flights aim at extending the laser altimeter time series through the gap between the end of ICESat data collection in 2009 and the launch of the ICESat-2 lidar in 2018. OIB data is used to estimate sea ice total freeboards and thicknesses over the Weddell Sea during 2009-2016. Local sea level heights are extracted from the ATM (lidar) L1B over leads/thin ice mapped by the DMS images. Total freeboard of sea ice is then derived from the ATM L2 by subtracting the nearest local sea level height. For the 2011 flights, our results are also compared with a previously published result that used the ATM L1B of the lowest reflectance threshold (< 0.25) as local sea level. Ice thickness derived by using the empirical equations shows reasonable spatial and temporal distributions, with thickest ice in the coastal northwest Weddell Sea. The averaged ice thickness estimated at each track varies from 1.27m to 2.25m, with an overall increasing linear trend of 0.035 m/yr from 2009 to 2016, although statistically insignificant ($p = 0.13$). Our next step is to bring into the analysis the ICESat data (2003-2009) for the same tracks and thus generate a longer time series (2003-2016) and more complete picture of sea ice variability in the Weddell Sea.

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