Abstract Preview - Step 3/4

- print version -

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

Polar program: None

Title: PIPERS:Ross sea ice freeboard and thickness retrieve from IceBridge ATM data

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Text: Ross Sea ice thickness is an important indicator of Antarctic climate change but needs to be evaluated over several seasons to define any trends. In November (20,21,27 and 28) 2013, NASA'S IceBridge mission flew over the Ross Sea, Antarctica and collected important surface sea ice data with airborne lidar(ATM) and digital camera imagery(DMS) for the first time. An automatic lead-classification method based on DMS images is developed in this paper. Using the leads only, we were able to derive the sea surface height anomaly by subtracting geoidal mean sea surface height product DTU15 from ATM L1B (~1m resolution) retrieved surface elevations. We then computed total freeboard (over the sea ice) by subtracting the derived sea surface anomaly from the difference between ATM L2 retrieved surface elevation (80 m sample width 40 m spacing along track) and mean sea surface height product DTU15. Preliminary results are, apparent reflectivity values of leads in Ross Sea are mostly less than 0.15; Track 1 and 4 (the two most near the coast) shows the thickest ice thickness, which can be as great as three meters. For all tracks (except one) mode thicknesses vary between 0.35-0.45 meter. Track 3 (east-west) shows the thinnest mode ice thickness (0.35 m) and mean ice thickness (0.48 m). An ATM and DMS mission using the NSF C-130 with the Icepod system was flown in 2016 and will be repeated in 2017. Using the 2013 mission shown here as a baseline will assist in defining any trends.

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