

Analysis of Arctic Sea Ice Pressure Ridges from ICESat-2

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Abstract

ICESat-2 carries a photon counting lidar which provides near-complete polar coverage. The 10 kHz 532 nm wavelength laser has a ~17 m footprint with measurements obtained every 70 cm on the earth's surface. Such high-resolution along-track measurements allow for extremely detailed sea ice topography to be captured over the entire Arctic. Here, the sea ice height (ATL07) data product, developed by the ICESat-2 science team for deriving sea ice freeboard, is shown to not be suitable for retrieving ridge heights through validation with coincident Airborne Topographic Mapper (ATM) laser altimeter data. Here, we show a first look at a new algorithm to find ridges from the geo-located photon product (ATL03) and compare it to coincident ATM data. We use our new algorithm to calculate ridge height and ridge frequency distributions through time and by ice type to track seasonal changes in the sea ice cover.