

Airborne ultra-wideband radar sounding over the shear margins and along flow lines at the onset region of the Northeast Greenland Ice Stream

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Abstract. We present a high-resolution airborne radar data set (EGRIP-NOR-2018) for the onset region of the Northeast Greenland Ice Stream (NEGIS). The radar data has been acquired in May 2018 with Alfred Wegener Institute's multichannel ultra-wideband (UWB) radar mounted on the Polar6 aircraft. Radar profiles cover an area of $\sim 24\,000\text{ km}^2$ and extend over the well-defined shear margins of the NEGIS. The survey area is centered at the location of the drill site of the East Greenland Ice-Core Project (EastGRIP) and several radar lines intersect at this location. The survey layout was designed to: (i) map the stratigraphic signature of the shear margins with radar profiles aligned perpendicular to ice flow, (ii) trace the radar stratigraphy along several flow lines and (iii) provide spatial coverage of ice thickness and basal properties. While we are able to resolve radar reflections in the deep stratigraphy, we can not fully resolve the steeply inclined reflections at the tightly folded shear margins in the lower part of the ice column. The NEGIS is causing the most significant discrepancies between numerically modelled and observed ice surface velocities. Given the high likelihood of future climate and ocean warming, this extensive data set of new high-resolution radar data in combination with the EastGRIP ice core will be a key contribution to understand the past and future dynamics of the NEGIS. The EGRIP-NOR-2018 radar data products can be obtained at the PANGAEA Data Publisher.

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