



## **Inter-trough glacial landforms on the outermost NE Greenland shelf – preliminary results**

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Today the Arctic is undergoing far-reaching changes with rising air and sea-water temperatures, and rapidly decreasing glaciers and ice sheets. In order to model future changes of the ice sheet-ocean-atmosphere climate system, it is urgent to obtain more knowledge on the glacier dynamics of the Greenland Ice Sheet. Very little is known about the past evolution of the eastern sector of this ice sheet, e.g. it has not been established where its maximum position was during the Last Glacial Maximum (LGM). Furthermore, neither ice dynamics, sediment production by subglacial erosion or timing and nature of ice recession from the shelf is established.

In this study, we have investigated the outermost part of the northeastern Greenland continental shelf. This is the widest shelf surrounding Greenland, with a shelf edge located more than 200 km off the coastline. Here, the shelf morphology comprises two large troughs (Norske Trough and the Westwind Trough) separated by a shallow bank complex (Belgica Bank, Northwind Shoal and the AWI Bank). Previous studies differ strongly on where this sector of the Greenland Ice Sheet reached its maximum position during the LGM. The studies point to positions from the inner shelf, mid-shelf or the shelf edge with the largest uncertainty related to the area of the shallow bank complex.

During favorable sea-ice conditions in 2017, a  $\sim 130$  km<sup>2</sup> area on the outermost part of the shelf was surveyed by multi-beam echo-sounder and a sub-bottom profiler (Chirp). Close to the shelf break, the data displays part of a shelf-break parallel ridge that is heavily scoured by icebergs. The ridge is c. 30 m high, up to 9 km wide and with a steep western (proximal) and a gentler eastern (distal) slope. Compared to the recessional moraines reported from elsewhere in this area (Arndt et al., 2017), this feature is wider and higher, and its shape resembles a grounding-zone wedge identified in the nearby Norske Trough. Thus, we tentatively suggest that the observed ridge is also a grounding zone wedge formed at the grounding line of an ice sheet or ice cap reaching the outermost shelf. Part of a second ridge is seen approx. 10 km west of (inside) this ridge, implying a dynamic ice front with several halts or readvances during the retreat from the outer shelf. The age of these features remains to be determined, and this will be part of the future analysis of the sediment cores obtained in the study area.