What lies beneath: A detailed bathymetry of the sea-floor below Ekstro¨m Ice Shelf, East Antarctica

Emma C. Smith (1), Reinhard Drews (2), Todd Ehlers (2), Dieter Franke (3), Christoph Gaedike (3), Coen Hofstede (1), Gerhard Kuhn (1), Astrid Lambrecht (4), Christoph Mayer (4), Ralf Tiedemann (1,5), Olaf Eisen (1,5)

(1) Alfred Wegener Institute (AWI), Bremerhaven, Germany (emma.smith@awi.de), (2) Department of Geosciences, University of Tübingen, Tübingen, Germany, (3) BGR, Federal Institute for Geosciences and Natural Resources, Geozentrum Hannover, Hannover, Germany, (4) Geodesy and Glaciology, Bavarian Academy of Sciences and Humanities, Munich, Germany, (5) Department of Geosciences, University of Bremen, Bremen, Germany

An extensive grid of seismic reflection data collected on Ekstro¨m Ice Shelf, East Antarctica, between 2010–2018, using an on-ice vibroseis source and snowstreamer, are used to make a detailed bathymetry map of the sea floor and ice-shelf cavity. The maps shows a deep sea-floor trough, likely a paleo-ice stream, under the western side of the ice shelf. The trough contains a number of points of higher topography, indicating probable former grounding line positions. At the shelf front a sill running across the width of the shelf has implications for ocean circulation and thus ice-ocean interaction and ice shelf melt. This new bathymetry is markedly different from previous models, which show a generally flat and shallow sea floor in the region. This is presumably the case for many of the smaller ice-shelves in Dronning Maud Land, which highlights the need for better bathymetry measurements in these key threshold regions.