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First results of sedimentological investigations of MeBo drill cores recovered from the West Antarctic continental shelf in the Amundsen Sea

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Abstract

During expedition PS104 with RV *Polarstern* in February and March 2017 the MARUM MeBo 70 seabed drilling system was deployed at nine sites on the continental shelf of the Amundsen Sea Embayment, West Antarctica. A total of 57 meters of sediment core were recovered from 11 boreholes located in Pine Island Bay, Pine Island Trough, Bear Ridge and Cosgrove-Abbot Trough with recovery rates ranging from 7 to 76%. The main scientific objective of the drilling was to reconstruct the Late Mesozoic to Quaternary environmental history in this part of the Antarctic continental margin, with a special focus on the past dynamics of the marine based West Antarctic Ice Sheet (WAIS) from its inception to the last glacial cycle. Another main goal of the expedition was to test the suitability of the MeBo drill system for operating on the Antarctic continental shelf and recovering pre-glacial and glacially influenced sedimentary sequences.

Here we will present the first results of sedimentological investigations carried out on the drill cores. These comprise (i) visual lithological descriptions, (ii) CT-scanning records of core stratigraphy, sedimentary structures, and possible artefacts induced by the drilling process, (iii) measurements of physical properties performed with a multi-sensor core logger, and (iv) characterisation of the geochemical composition of the drilled sedimentary strata using X-ray fluorescence (XRF) scanner data. Preliminary biostratigraphic investigations conducted on board ship indicated that the recovered sedimentary strata were deposited during various time slices spanning from the Late Cretaceous–Palaeocene to the Late Quaternary. We will provide an update of these initial chronological findings.

Keywords: Drill cores, shelf sediments, West Antarctic Ice Sheet.