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The continental margin of East Greenland: glacial influences on sediment deposition between 72˚N and 75˚N

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The extend of the Greenland ice sheet during the Plio/Pleistocene of East Greenland is largely unknown. It is assumed that in this period shelf regions were repeatedly eroded and formed by glaciers. Present - day bathymetry, particularly in the fjords shows prominent troughs which were probably formed by fast flowing ice currents. Information on the intensity and frequency of the glacial periods can be derived from seismic data from the East Greenland continental margin. Shelf sediments show clearly prograding sequences, which are indications of glacial influence.

A comparison of seismic profiles from 2003 demonstrates that the progradation of the shelf decreases from north to south. Prograding sequences on the northern profile (AWI-20030390) are visible over a distance of 75 km. The glacial structures on the profile AWI-20030350 extends only over 38 km. While high sedimentation rates are recognisable between glacial periods in the southern part of the investigation area, topsets are eroded on the northern profiles. For this region, either strong glacial erosion or lower sedimentation rates between erosional cycles can be suggested.

Data processing shows that the velocity structure is complex. The glacially influenced shelf region is not only visible in the sedimentary reflectors, but also in their velocity structure. The velocity gradient inside the upper sediments is very high and velocities of about 2100 m/s can be expected. An analysis of seismic refraction data confirms this assumption. Furthermore, low-velocity-zones are located in the subsurface at the continental shelf to continental slope transition. On profile AWI-20030390, about one kilometer below the prograding sequences, a low-velocity-zone is visible where velocity decreases from 2700 m/s to 2400 m/s.

First results of this campaign will be introduced.