

FS MARIA S. MERIAN, Fahrt MSM04/4a
27.2. – 16.3.2007
Las Palmas – Las Palmas



Second Weekly Report, period 5.3.- 11.3.2007

The second week of MERIAN cruise MSM04/4a started with a challenge for the skills and nerves of crew and scientists. After deployment of the sea floor drill rig MeBo in 900 m water depth on Sunday afternoon (4th March) we had good progress and reached a drill depth of 26.5 m until the morning of Monday. A failure of the hydraulics then caused a loss of work power - and we still had 18 m drill string in the drilled hole! We had to activate all emergency measures that were invented for such cases. The chuck that clamped the 18 m drill string was opened by an extra power source that was activated acoustically. During the recovery phase the control of the winch failed. With the combined efforts of the MeBo-Technicians from the Marum Center of Marine Environmental sciences at the University of Bremen and the technicians from MARIA S. MERIAN we were able to by-pass the control problem and to proceed with lifting the MeBo to the sea surface in the afternoon. The movable legs of the MeBo still had to be armed in before recovery of the drill was possible. The Zodiac of the MARIA S. MERIAN was launched in order to install an extra hydraulic connection from the vessel to the drill rig for lifting the legs. Thanks to the experienced crew MeBo was safely recovered and back on deck in the evening of the same day. About 17 m sediment cores were unloaded from the magazines of the MeBo.



After a failure of the MeBo-hydraulics the Zodiac was used for installation of an external hydraulic line in order to lift the movable legs for safe recovery of the drill rig.

Core inspection after pore water sampling and geophysical measurements confirmed the high quality of the cores. However, the top sections of each 3 m section are covered by drilling sludge. This drilling sludge is generated in very soft sediments

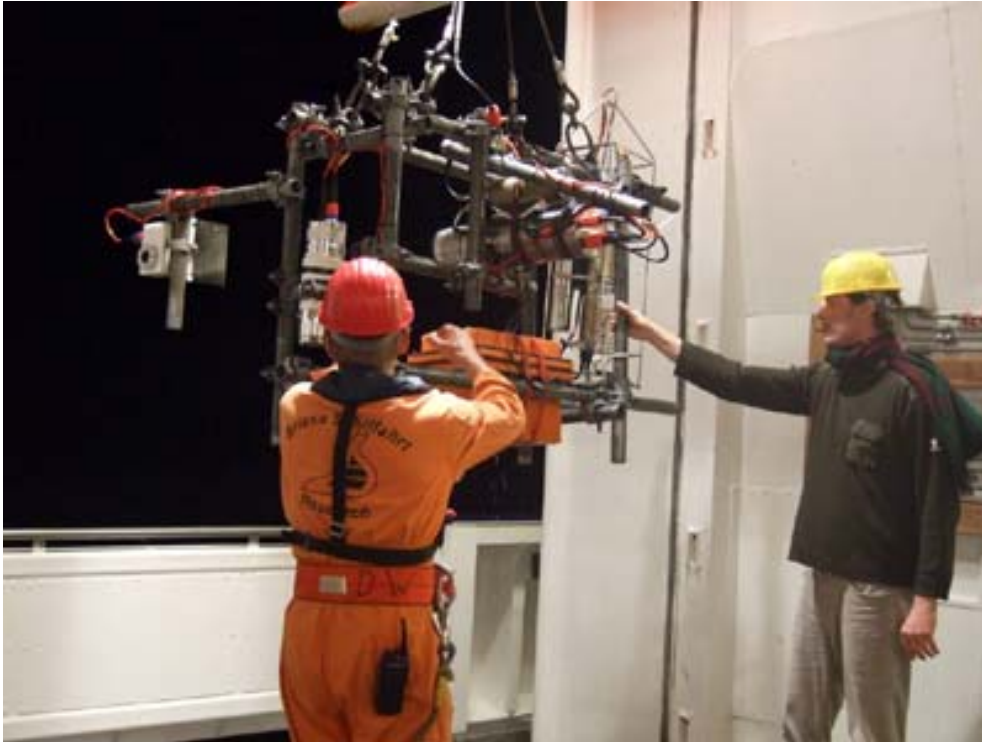
during the build up of drill string to the base of the drilled hole. Using conventional drilling technique this procedure is required for each 3 m core barrel. The drilling sludge limits the amount of intact sediment core that can be recovered with each core barrel. Since this shortcoming can be avoided by using wire line drilling technique, this result encourages us to implement the possibility for using wire line drilling within the next upgrade period for the MeBo system.



Scientist from the DFG Research Center Ocean Margins (University of Bremen) during inspection of the sediment cores.

The repair of the MeBo-hydraulics and the winch and preparation for the next MeBo deployment took until the morning of Wednesday (7th March). This time was used to continue mapping of the Agadir Canyon region with Multibeam and Parasound and to investigate particle distribution and sizes with a rosette water sampler and the particle camera ParCa. We were able to plan the stations after inspection of current daily satellite maps of the pigment concentration in the surface waters that were analysed onshore in Bremen.

Rough sea in the Cape Ghir region with wind strength of 7 to 9 Bft made a MeBo deployment on Wednesday impossible. Since there was no indication for calming within the next days we decided to use this bad weather period for steaming south to the second investigation area at the continental slope off Western Sahara / Morocco near Cape Bojador. However, when we arrived in the investigation area in the evening of Thursday (8th March) we still had a swell of about 4 m and wind strength of 7 to 8 Bft.. This bad weather period was used for further deployments of ParCa and water rosette. A first comparison of the particle concentrations off Cape Ghir and Cape Bojador shows that the particle distribution in the water column is strongly influenced by the morphology. "Classical" profiles with maxima in surface waters and right above the sea floor were observed at the rather gentle slope off Cape Bojador. In contrast, the Agadir Canyon area with its steep slopes is characterised by several subsurface maxima below the euphotic zone.



The Particle Camera ParCa is used for the investigation of particle dynamics in the water column

We mapped a big slide with Multibeam and Parasound until Saturday. The quality of the soundings was very good despite of the rough sea conditions. We were able to identify the morphologic slide structures, to estimate the thickness off the sediment cover belonging to this slide and to identify the stratification of the underlying older sediments. A site with only thin cover of young sediments and undisturbed stratification below was chosen for a MeBo deployment during this cruise in order to get a long sediment core for the study of Neogen climate history of NW Africa.

After a decrease in wave height and wind strength the MeBo was deployed at this site in a water depth of about 920 m on Saturday afternoon. We started with push coring which stopped at 2 m sediment depth at a maximum push force of 4 tonnes. We continued with rotary drilling and reached until now (Sunday afternoon, 17:00) a drilling depth of 26.65 m.

We are all in good health and send our best wishes.

Tim Freudenthal and the MSM04/4a shipboard party.

At sea, 11th March 2007