

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



### **First Weekly Report, period 25.02.- 4.3.2007**

When the scientists from the DFG Research Center Ocean Margins (RCOM) at the University of Bremen arrived at 25<sup>th</sup> February on the research vessel Maria S. Merian in Las Palmas, most of the technical equipment was already installed by the technical crew of the Marum Center of Marine Environmental Sciences (University of Bremen) and the crew of the MARIA S. MERIAN. The most challenging part of the mobilisation was the setup of the robotic under water drill rig MeBo (abbreviation of "Meeresboden-Bohrgerät", the German expression for sea floor drill rig). This mobile drill rig was developed in 2004/2005 at the University of Bremen. The 6 m high machine with a weight of about 10 tonnes is electro-hydraulically driven. It is deployed on the sea floor and remotely operated from the vessel. With this unique device marine geologists can get up to 50 m long cores from soft sediments and hard rocks at the sea floor. This deployment during leg MSM04/4a is the first research expedition with the MeBo for the RCOM and the first deployment on the Maria S. Merian after two expeditions for testing the MeBo in 2005 and a scientific deployment at the Porcupine Bank west of Ireland in 2006.

It was a lucky chance that three other European research vessels stayed in the harbour of Las Palmas during our mobilisation phase: the German vessel FS POSEIDON, the french vessel RV Pourquoi Pas? and the russian vessel RV Professor Logatchev. Scientists and crew members of all three vessels took the chance to visit the RV MARIA S. MERIAN and to have a look at the MeBo-System.



## Test of Launching the sea floor rig MeBo from RV Maria S. Merian in the harbour of Las Palmas

After a successful test of the launch and recovery procedure of the MeBo in the harbour of Las Palmas the ship sailed on 27<sup>st</sup> February 2007 at 14:00 UTC from Las Palmas to the first investigation area at the continental margin of Morocco west of Cape Ghir. This region is characterised by high primary productivity due to coastal and filament upwelling of nutrient enriched water masses. The sediments in this region are also characterised by high accumulation rates of terrestrial material due to the proximity to the southern rim of the Atlas mountain chain. The dominant geological structure in this region is the Agadir Canyon, which is responsible for the transport of shelf material into the deep sea. Thanks to 6 to 10 m long gravity cores taken at a previous expedition with the Research Vessel METEOR (M45/5, 1.10. – 3.11.1999, chiefscientist: S. Neuer) we know, that sediments with extremely high sedimentation rates of more than 100 cm per 1000 years can be found at the upper continental slope in the vicinity of the Agadir Canyon. The goal of the MeBo deployment in this region is to get longer cores at these sites with extremely high sedimentation rates that can be used as archives for paleoclimate reconstructions in order to investigate climate change at decadal scale not only for the present warm period but also for the last glacial period.

The first day after arriving in the investigation area was used for a MeBo test deployment. The system worked without technical problems but inspection of the core recovered revealed that we had to adjust the penetration rate of the core barrels in these soft muds in order to increase the core recovery rate. We started at 1<sup>st</sup> March 2007 at 19:30 with the second MeBo deployment. After loss of one core barrel in the night we had to move the drill by about 20 m and started a second drill hole. We then drilled down to 41.55 m with push coring technique until the night of 3<sup>rd</sup> March 2007. After a total of 53 hours deployment time the drill rig was back on the work deck. All scientists helped to unload the cores and were excited about the high quality of the cores visible through the transparent plastic liners with nearly 90 % core recovery in total. This is probably the longest marine sediment core obtained from a German research vessel. Gas and pore water sampling started already in the night. After geophysical measurements the cores will be opened within the next days for a detailed core inspection and description. Meanwhile the drill rig was prepared for the next deployment that started in the afternoon of 4<sup>th</sup> March.



Left: Opening of the core barrels for recovery of the MeBo sediment cores; Right: pore water sampling using the suction method

Next to the MeBo deployments we started mapping the Agadir Canyon region with Multibeam Echolot and Parasound. A particle camera and a rosette water sampler were used in order to analyse particle distribution and sizes during their transport in the water column. These investigations, that are mainly conducted during maintenance and preparation work on MeBo between the deployments, will increase our understanding of the sedimentation dynamics in the investigation area and will thus help us to interpret the results from the sediment core analyses.

All persons on board are very busy, in good health and send greetings at home.

At sea, 4<sup>th</sup> March 2007

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