

Research Vessel SONNE

SO266:

Kaohsiung – Kaohsiung

1st Weekly Report: 10 – 21 October 2018



On Monday 15 October 2018 at 05:12 p.m. local time, RV SONNE left her berth at Pier 7 in Kaohsiung seaport to investigate the distribution of methane hydrates at the Taiwanese continental margin by using the mobile seafloor drill rig MeBo200 (Abb. 1). Before we had five days of intense work on board, mobilizing the equipment for the expedition. We arrived at the ship on Wednesday 10 October. First two containers from the cruise before had to be unloaded. When the eleven containers for our cruise SO266 arrived we had to install nine containers onboard and one 20' and one 40' container had to be discharged. The extended stay in the port was necessary for the setting up MeBo. During the mobilization, the 12 people-strong installation crew from Germany had the opportunity to take in the bustle of urban life of Kaohsiung a 2.7 million city and its seaport which is the biggest of Taiwan and the 13th biggest in the world. Most of the Taiwanese oil import is passing through this port onto the industry around.



Fig. 1: Setting of seafloor drill rig MeBo200 in the trade port with a view on Kaohsiung's downtown silhouette (© Gerhard Bohrmann).



Fig. 2: Participants of the reception on Friday 12 October at Kaohsiung Banana-Pier on the occasion of research vessel SONNE's visit (© Saulwood Lin).

On Friday 12 October SONNE moved to the so-called Banana Pier whose name refers to the former main export good bananas that was handled on this pier. Nowadays this berth with its former warehouses has been developed into a very attractive maritime leisure and culture area, that is enjoyed by Taiwanese families and tourists alike. By assistance of the Honorary Director of the German Institute in Kaohsiung and using the mayor's press distributor list, journalists had been invited to attend a press event onboard RV SONNE. Numerous journalists used the opportunity to see the ship and its research facilities, and to get information on the Taiwanese-German Research project on marine methane hydrates. More than 30 visitors were invited to the following reception in the vessel's hangar (Fig. 2). Along with representatives of the seaport, the German Institute in Taipei, also the Director General of the Taiwanese Ministry of Science and Technology, Mrs. Hsinya Huang had arrived. Consequently, the port visit of the German research vessel and the joint Taiwanese-German research program on methane hydrates in the ocean lead to a considerable echo in local and nationwide press.

At the weekend further scientists from Germany and Taiwan arrived and set up their own labs on the ship. After having discharged another container with ship equipment from Germany, we finally heard the command „cast off' on Monday 15 October, and SONNE left the natural port of Kaohsiung in a beautiful

sunset (Fig. 3). The elongated port basin is separated by the narrow but 8.5 km-long Qijin Island that consists of a former raised coral reef (Fig. 3), and an offshore sandbank in the South towards Taiwan Strait.

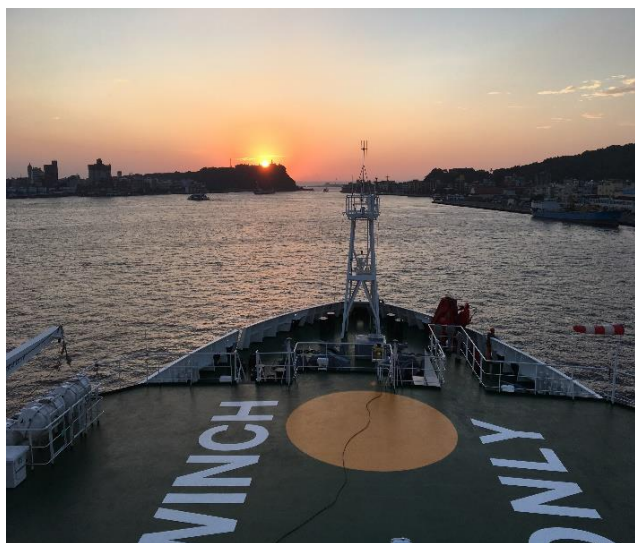


Fig. 3: RV SONNE leaving the port of Kaohsiung under the early evening sun and heading the northern port exit (© Gerhard Bohrmann).



Fig. 4: Compact field of chemosynthetic mussels with small white limpets and different crabs 1320 m water depth on Four-Way-Closure Ridge (© RV SONNE, SO266).

After a 24-sea-mile transit, we crossed the EEZ border of Taiwan and carried out a CTD cast for measuring the water sound velocity. These data were used to calibrate the ship's own multi-beam system. The subsequently acquired seafloor maps of the so-called „Four-Way-Closure-Ridge“, once more documented the superior quality of SONNE's multi-beam system which is the biggest that was ever installed on any research vessel. Tuesday 16 October was used to install the newly acquired OFOS (ocean floor observation system) on board and to take two gravity cores while the MeBo-team finished the last preparations for the first drilling. After collecting more multi-beam data during the night, on Wednesday 17 October, the MARUM MeBo200 was deployed to the seafloor. The drill site was chosen based on a comprehensive geophysical experiment that was carried out during SO227 in 2013. In particular the seismic 3D seismic data proved to be an invaluable tool for deciding on the final drilling location because it allows to image the subsurface with a resolution of 3.5 m. By means of a micro-bathymetry map which had been acquired by an autonomous underwater vehicle (AUV) by our Taiwanese colleagues, we could find an acceptable slope gradient for MeBo. After MeBo had landed on the seafloor successfully it drilled to 21 m below seafloor. Unfortunately, there was a small leak in the hydraulic system and we had to retrieve the drill rig. When redeploying after the repairs on the next day the winch malfunctioned and only on Sunday 21 October we could start drilling again. In the meantime, the sediments we had recovered with MeBo and the gravity corer had been processed.

Two heat-flow transects, one CTD transect and three OFOS dives and further hydro-acoustic mapping completed the program. Especially impressive were the OFOS-derived seafloor imagery. It was easy to maneuver the instrument on the seafloor based on the AUV micro-bathymetry and the backscatter intensity maps and we could identify several active fluid- and gas emissions based on the benthic ecosystems (Fig. 4) on the „Four-Way-Closure-Ridge“ in 1340 m water depth. Due to a military exercise in that area we had to leave and are now drilling successfully on Formosa Ridge. Details on that will be given in our next weekly report.

Weather conditions so far are very good and did not lead to any restriction of our station work.
Best regards on behalf of the cruise participants,