

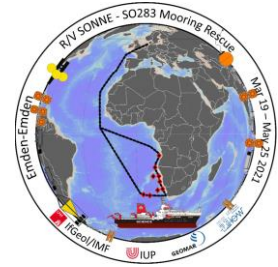
R/V SONNE

SO283 "Mooring Rescue"

Emden - Emden, 19.03. - 25.05.2021

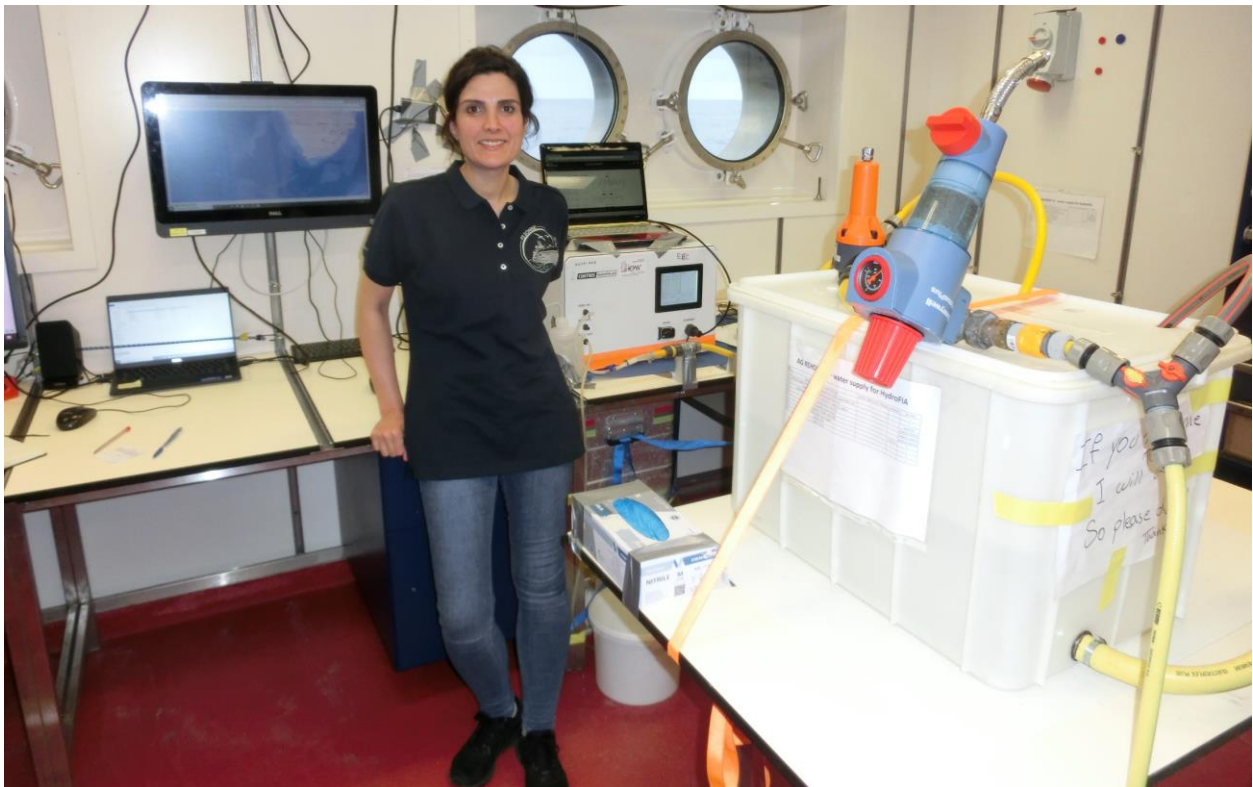
4. Weekly Report

05. - 11.04.2021



Mooring work has started

Speed is relative. In normal conditions and weather, RV SONNE is traveling at a good 12 kn marching speed. 12 kn is about 22 km/h, which is about the speed at which you can make progress on a leisurely bicycle ride. Now, hardly anyone will set themselves the goal of covering 6,000 nautical miles or the equivalent of over 11,000 km by bicycle in three weeks. But in addition to speed, consistency is also a factor. And if you can do 12 knots 24 hours a day without a real break, as we did, then even great distances are possible in a relatively short period of time. And that is exactly what we have done now: in three weeks since leaving Emden, we have covered more than 6,000 nautical miles and arrived at the first working area with mooring operations after exactly 21 days of sailing.



Bitu Sabbaghzadeh from IOW with her underway measurement system for precise pH measurements (under the left bull eye including a sophisticated water filtration system (in the foreground), which allows 24-hour measurement operation (© Universität Hamburg/Niko Lahajnar).

After having crossed the tropical Atlantic, having passed the Tropic of Capricorn already on April 06, we notice in the last days also at the temperatures on deck that we are now sailing towards the autumn of the southern hemisphere. The days and nights are no longer as hot and humid as they were a few days ago. But fortunately the weather conditions remain favorable, so that we find optimal conditions for our research - and this already for weeks. And so, on deck as well as in the laboratories, we take advantage of the opportunities to take samples during the crossing

and to conduct continuous underway measurements. In addition to dissolved inorganic carbon (DIC) and total alkalinity (TA), both important parameters for the inorganic carbon cycle, the pH value of the surface water is also measured on this cruise. It is precisely the pH value that plays a decisive role in the increasing acidification of the world's oceans. Therefore, our long north-south transect in the Atlantic is an important contribution to a highly topical issue.

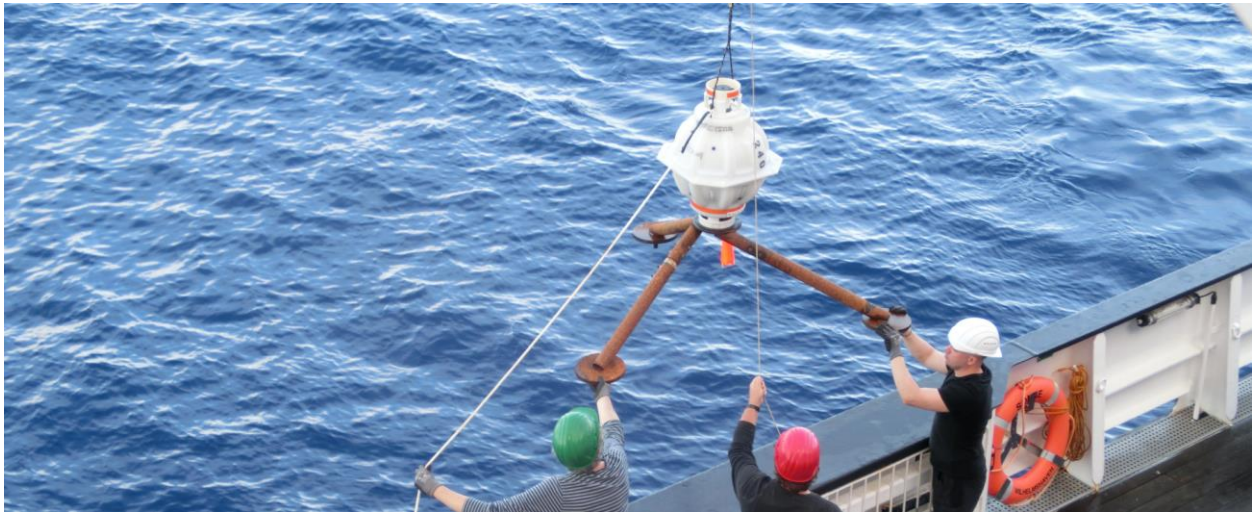
Then on Thursday, 08.04.21, the machines were stopped and preparations for the mooring work in the TRR-181 program started. After a careful survey of the bathymetry at the intended mooring position and the physical measurements of the water layers based on a 5000 m CTD profile, the actual deployment of a 5000 m mooring for the TRR-181 research program by the Institute of Environmental Physics (IUP) of the University of Bremen started right on time at 07:00 on 09.04.21. 5000 m mooring is a huge challenge for all involved, i.e. for the ship's command, for the deck crew, but of course also for the scientists themselves. Everything really has to fit when more than 30 sensors and instruments are physically measuring the entire water column hour by hour and day by day for the next year - and that for at least one year. The preparation time during the long journey was perfectly used for this, so that after less than 5 hours of deck work, the anchor went overboard at 11:43. and the system disappeared into the depths of the Atlantic.



An ADCP including a float is deployed during mooring operations in the South Atlantic (© Universität Hamburg/Knut Heinatz).

In the days that followed, so-called PIES (Pressure Inverted Echo Sounders) were then deployed at previously selected positions in the working area. These instruments will also autonomously measure the water layers during the next months and provide important information about the water mass distribution in the South Atlantic. On Sunday, 11.04.21, the second almost 5 km long mooring system of the IUP was already on the station schedule. At 06:30 the head buoy went into the water and after that successively about three dozen instruments and sensors in predefined intervals. Shortly before 11:00, the entire system was actually already ready to be deployed, but due to the strong current, the SONNE could only tow the system very slowly to the designated anchor position, so as not to expose the instruments, ropes and shackle connections to too much tension. Safety first. At exactly 14:10. the time had come, the anchor was released and pulled the almost 5 km long mooring system with it into the depths of the Atlantic. Finally, at 14:40, the head buoy also submerged, so that the station could be finished and we left for the next PIES station.

It was definitely a successful Sunday in the sunny South Atlantic and an important milestone of this trip could already be successfully checked off.



A PIES of the IUP being released (© Universität Hamburg/Niko Lahajnar).

All are well and greet the people at home.

At Sea, 11.04.2021

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