FS SONNE

Cruise SO285 „TRAFFIC 2“
Emden – Emden,
20th August – 02nd November 2021

4. Weekly report

Reporting period : 6th – 12th September 2021

Planning for this week began just five weeks before the cruise on July 13th, 2021. Early that morning, I received an email asking if we could recover two free-drifting buoys in the central South Atlantic while transiting to our working area. The buoys are part of the PIRATA program, which is integrated into a global ocean observing system and collects meteorological and oceanographic data to better understand the role of the ocean in the climate system and improve climate predictions. PIRATA is the acronym of the research program entitled “Prediction and Research Moored Array in the Tropical Atlantic”.

Figure 1: Head buoy of the PIRATA array on deck of RV SONNE. (Picture: Solvin Zankl)

The PIRATA buoys were deployed on September 15th and 28th, 2020. They consist of a head buoy that floats on the water and a cable of about 700 m length hanging below the head buoy. The cable, like the head buoy itself, is equipped with a suite of scientific instruments that send daily data to the National Oceanic and Atmospheric Administration of the USA (NOAA). These PIRATA arrays are also anchored to the seafloor with weights and a rope of approximately 3-4 km length depending on the water depth.
On June 26th, about 8 months after the deployment of these arrays, the position of the first PIRATA buoy started to change, and less than 10 days later, on July 5th, also daily changing

position reports of the second PIRATA buoy followed. This information showed that the first buoy at about 10 °S drifted into the territorial waters of the British Island of Ascension.
It became apparent that we now would need a work permit from London to recover this PIRATA buoy. Work permits are applied for via the German Research Fleet Coordination Centre and the German Federal Foreign Office at the responsible authorities of the respective country. Due to the urgency of our request, we submitted an urgent application, which London granted within a very short time due to the immediate efforts of all members involved. At this stage, we would like to thank all parties involved.

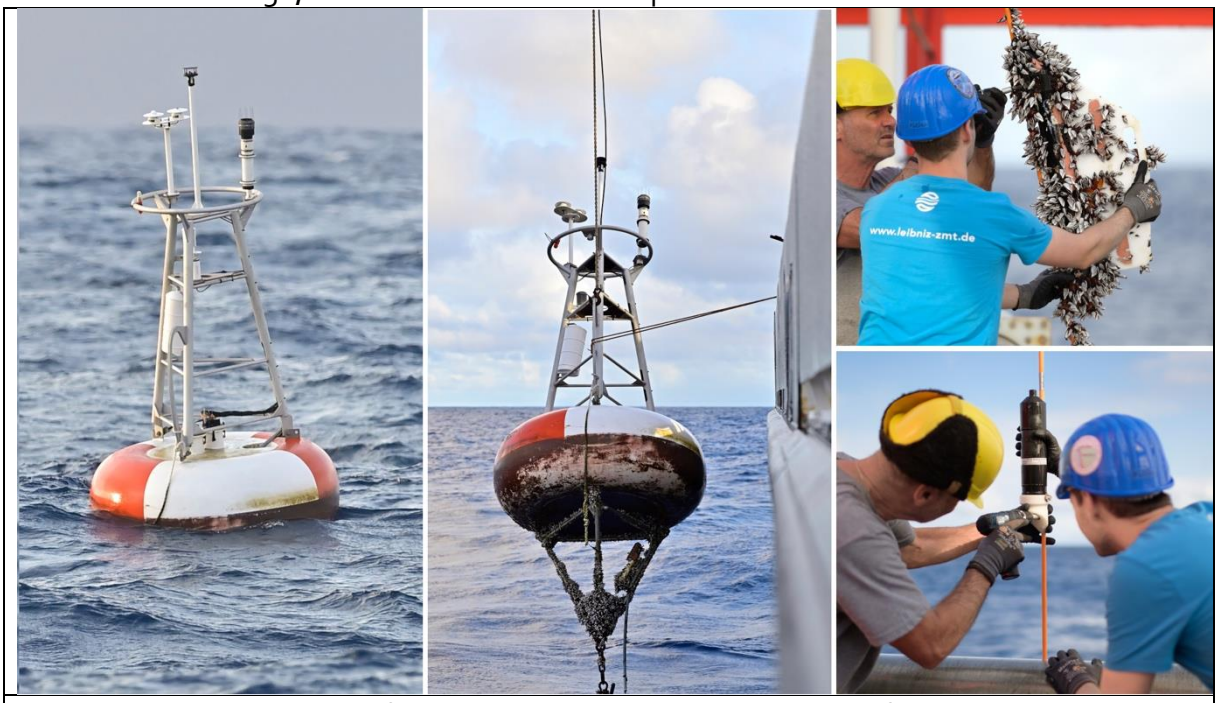

Figure 2: PIRATA head buoy drifting in the Atlantic Ocean and on a hook of RV SONNE as well as the recovery of scientific sensors from the cable below the head buoy. (Picture: Solvin Zankl)

On Sunday, September 5th, the first buoy appeared on the radar at about 5 o'clock in the morning, and shortly thereafter, the bridge of RV SONNE sighted it. On the working deck, the recovery crew consisting of members of the ship's crew and scientific staff got ready to pick up the PIRATA buoy under the supervision of the bosun. At 8:47 am, the head buoy was hooked and placed on deck, followed by the cable with all the scientific equipment except one sensor. Above the position of the last sensor at a water depth of about 400 m, the cable was broken for unknown reasons so far. The last part of the cable was recovered at 10:05 am. With this, the recovery was completed about 6 hours after the buoy was first located. We spent the rest of the day cleaning the equipment from barnacles, which settled on the buoy, storing the head buoy in a container, and securing the scientific equipment in boxes for shipment back to the USA. After briefly reporting success to all involved persons ashore, we continued our cruise to recover the second PIRATA buoy drifting about 1200 nautical miles away at approximately 19 °S.

Figure 3: Recovery of the second PIRATA buoy on board RV SONNE and preparation for its return to the USA. (Picture: Solvin Zankl)

The second buoy was sighted after two days of sailing on September 7th at 1:12 pm, and was lifted on board about an hour later. The last piece of cable and all scientific sensors attached to it were retrieved at 3:11 pm. Similar to the first buoy, the cable of the second one was also broken but at a deeper water depth of about 590 m. Since the second buoy was floating in the nutrient-poor subtropical gyre of the South Atlantic Ocean, biofouling was negligible, which simplified cleaning and packing of the instruments. While storing all components safely in a container, we continued our voyage towards our working area off South Africa and Namibia. Reports on this next part of the cruise will follow in the upcoming week.

RV SONNE, at sea, 19 °S / 16 °W, 12th September 2021

Tim Rixen
(Leibniz Center for Tropical Marine Research Bremen / Universität Hamburg)