

2nd Weekly Report M208, Mindelo-Mindelo

17.2.-23.2.2025



The second week of Meteor cruise M208 began with the first part of our enhanced observational program in the coastal upwelling system off Mauritania. Upon arriving in the designated area, we deployed two gliders—one equipped with an additional nitrate sensor and the other with an underwater vision profiler (UVP). The UVP is designed to measure the number of particles in different size classes while simultaneously capturing images of larger plankton species, primarily zooplankton. Both gliders are intended to observe water characteristics in frontal systems associated with coastal upwelling, eddies, and filaments. They have now been operating smoothly for six days. Real-time positions and their data can be viewed at gliderweb.geomar.de.

Following the glider deployments, we proceeded to the designated mooring positions, where—after carefully surveying the topography—we deployed three current meter moorings. The mooring at the deepest site, in approximately 500 meters of water, is additionally equipped with four UVPs to collect time series of sinking particles and capture plankton images. The other two moorings are so-called landers, positioned on the seafloor at depths of 100 meters and 50 meters. Observations of the velocity field at these locations are particularly aimed at studying internal tidal waves propagating toward the coast, where they dissipate in shallow waters. The dissipation of internal waves leads to enhanced turbulence, which is essential for the upward mixing of nitrate, thereby sustaining high biological productivity in coastal waters.

Near the deep mooring site, an enhanced CTD and water sampling program was conducted to measure various tracers, including not only classical water mass characteristics but also different nutrients and trace metals. Additional water samples were used for incubations to test the capability of phytoplankton to use nitrogen from the air for their growth. Nitrogen fixation can support biological productivity particularly in cases of unavailability of nitrate. Net catches with a multinet lowered to 1000 m, as well as bottle nets attached to the CTD, provided additional information on plankton diversity and abundance in the region.

The enhanced observational program off Mauritania concluded with underway measurements using a moving vessel profiler, which recorded temperature, salinity, and chlorophyll concentrations in the upper 100 m while the vessel steamed at a speed

of approximately 8 knots. The final planned action in the area was the deployment of our third glider, equipped with a microstructure sensor. However, after deployment, the glider reported a leak and had to be recovered. We will come back to that area at the end of the cruise to recover gliders and moorings.

Meanwhile, the two missing supply containers arrived in Mindelo and were ready for pickup. Before heading to the port of Mindelo, we conducted a similar CTD, water, and net sampling station at the Cape Verde Ocean Observatory (CVOO) as we had done off Mauritania. The CVOO is a long-term interdisciplinary observational program, with a mooring installed north of São Vicente since 2006.

In the port of Mindelo, the supply containers were received, and everyone helped to unload them. Early in the afternoon, Meteor left the harbour and headed to our southernmost station at 11°N. Despite the time lost due to the delayed containers, we are all confident that we can complete most of our planned research program. The support from the ship in streamlining various activities is greatly appreciated, as is the excellent working atmosphere on board.

Greetings from the tropics,

Peter Brandt and the participants of Meteor cruise M208



Fig. 1: The top element of the mooring, along with a UVP beneath it, is deployed at the 500-m mooring site (Photo: Peter Brandt).