



RV Meteor
Cruise M164 (GPF-19-1-105)
23.06.-31.07.2020
Emden – Emden



1. Weekly Report

23.06.-28.06.2020

Conducting a scientific oceanic expedition in the summer was something very normal last year, but it is almost something very special in the summer of 2020. The global Corona pandemic has severely shaken up the schedule of the German research ship fleet. We, i.e. two oceanographic teams from the University of Bremen (MARUM and the Institute for Environmental Physics) and the Federal Hydrographic and Maritime Agency (BSH) in Hamburg are among the lucky ones, whose trip did not have to be canceled due to the Corona pandemic, and whose work area is reachable for the research vessels even when departing from and returning to a German port.

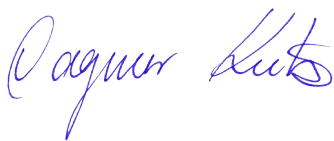
And here we are, aboard the research vessel (RV) *Meteor*, on the way to the southern subpolar North Atlantic, where in the next few weeks we will be conducting between 47°N and 53°N basin-wide physical-oceanographic measurements and studies of the oceanic circulation and of the water mass exchange in the North Atlantic. In order to do justice to the hygiene and safety requirements associated with the pandemic, we had to reduce a bit the size of our scientific team and go into quarantine before the start of the expedition. There we were tested for the virus. Luckily we all received a negative report and were allowed to embark the RV *Meteor*. The packing work began in the port of Emden. All of the freight containers brought along were emptied and the laboratories were set up. On Tuesday, June 23rd, 2020 we left our pier in the port of Emden and officially started the expedition *M164 (GPF-19-1-105)*. We passed and greeted the RV *Maria S. Merian*, which would also leave for her next expedition a few days later, and started our multi-day transit trip to the work area.

In the coming weeks we will cross the North Atlantic from east to west at approx. 47°/48°N. Last year during our cruise *MSM83* with RV *Maria S. Merian* we deployed measuring devices in the form of deep-sea moorings and bottom sensors along this line on the eastern and western sides of the Atlantic, as well as in the deep basins east and west of the Mid-Atlantic Ridge. These form the *NOAC* deep-sea observatory. With the help of this data and the present ship-based measurements we want to determine how much warm and saline water flows with the Gulf Stream from the subtropics across 47°N into the North Atlantic or how much cold and fresh water from the

sub-Arctic region flows to the south. We have been carrying out these measurements in this form for a number of years, so that over time there are longer time series that indicate fluctuations in the circulation. This knowledge of fluctuations on time scales ranging from days to decades is important in order to obtain a better understanding of the physical processes that influence the strength and fluctuation of the circulation of the Atlantic and its components at 47°/48°N. The measurements are part of the [RACE-Synthesis](#) project funded by the German Federal Ministry of Education and Research (BMBF).

Our route first led through the southern North Sea into the English Channel. After three days we reached the French shelf edge and started our field work there with a first test station. At two other stations, we prepared the mooring work by testing devices that are to be used in the moorings. Furthermore, comparative measurements were carried out between different types of temperature, salinity and pressure sensors, the three most important parameters for the water mass analysis. As a German contribution to the international *Argo* program, we deployed a first autonomous float. We then carried out the first ship-based measurements of the water masses and currents near the Irish shelf edge and were able to successfully recover the two deep-sea moorings EB-1 and EB-3 on Saturday, June 27th, 2020. The recovered devices are now examined, the data read out from the devices, and the moorings prepared for the redeployment at the beginning of the coming week.

Best wishes on behalf of all cruise participants and our thanks to Captain Hammacher and the crew of RV *Meteor* for the extremely friendly welcome here onboard. Our thanks also go to the *German Research Fleet Control Centre* (LDF) and the *Briese Research* shipping company for all the support they have given in the course of preparing for this cruise. If you are interested, you can also follow our cruise on Twitter: https://twitter.com/Meteor_M164



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Unloading the containers aboard RV Meteor. Photo: D. Kieke



*The water sampling bottles are cleaned and prepared for the start of the measurements.
Photo: S. Wett*