M212

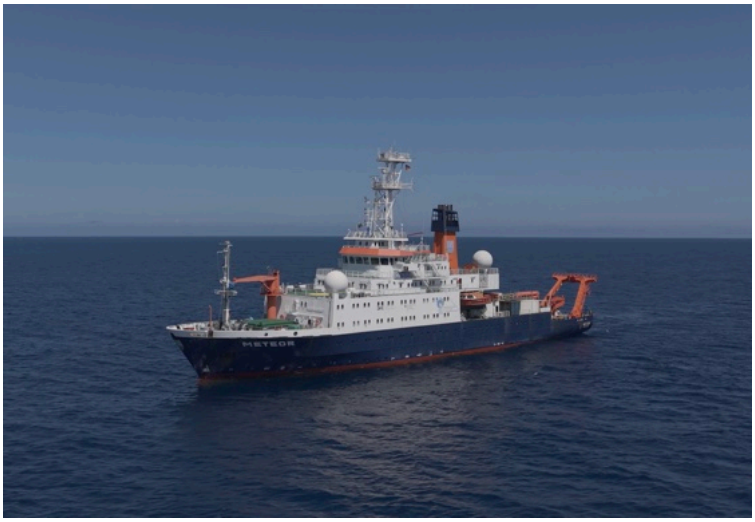
Ponta Delgada — St. John's
July 30 — September 2, 2025

Weekly Report No. 1
(July 30 — August 4, 2025)

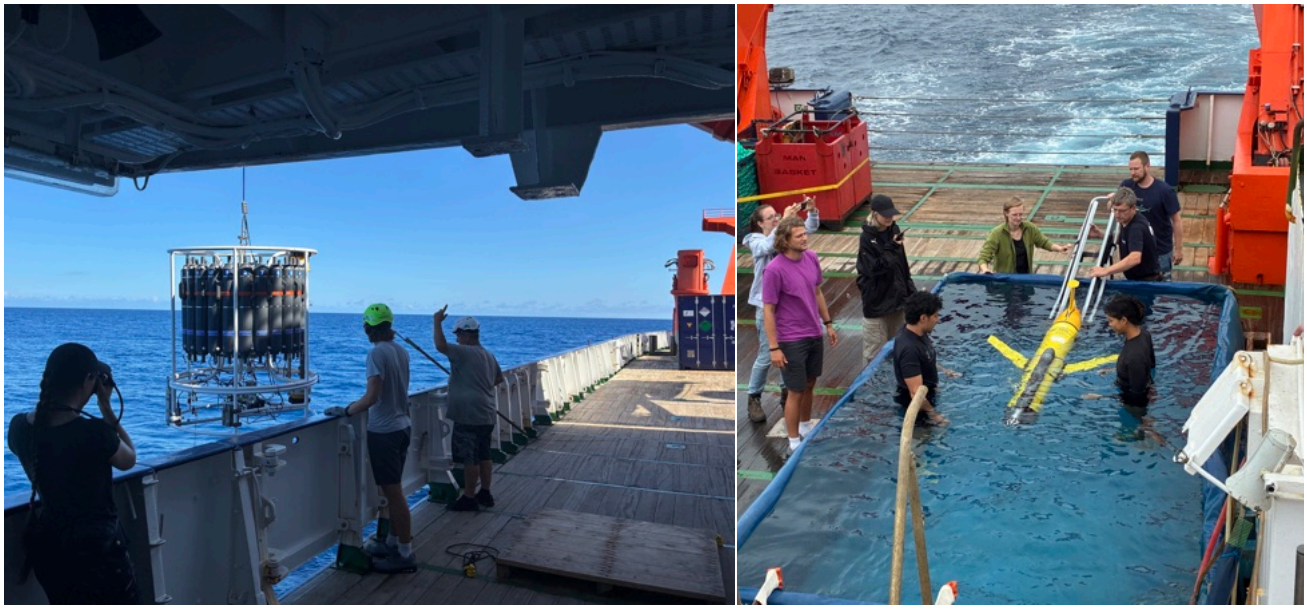
Expedition M212 of RV METEOR is a contribution to the coordinated EU project EPOC (epoc-eu-.org/) and the DFG Collaborative Research Centre CRC 181 (www.trr-energytransfers.de/). EPOC stands for *Explaining and Predicting the Ocean C*onveyor and it aims to identify key processes that determine the meridional connectivity of ocean transports, in particular the mechanisms that are responsible for the coherence of the Atlantic Meridional Overturning Circulation (AMOC) across different latitudes in the Atlantic. During our cruise we will be particularly interested in the influence of North Atlantic Current variability on the Deep Western Boundary Current. Within the CRC 181 project we will study the relationship between mesoscale structures (e.g., fronts and eddies) and the oceanic internal wave field with a focus on adaptive sampling by autonomous underwater vehicles (gliders).

We left the port of Ponta Delgada, in the morning of Wednesday, July 30, at 09:30 local time for the four-day transit to the research area that is located at Flemish Cap and the Grand Banks of Newfoundland. Our team consists of 19 scientists from the Universities of Bremen, Hamburg, and Tallinn. The scientific program includes hydrographic surveys, tow-yo sections, surveys with autonomous gliders, and deployments of floats and inverted echo sounders. The cruise M212 stands at the end of the two-year EPOC field experiment which will improve the understanding of the physical processes that determine the transport variability in the so-called Transition Zone between subpolar and subtropical Atlantic.

After two days at sea in perfect weather, we left Portuguese territorial waters on Friday morning and carried out a test station with CTD and water sampler, as well as with the free-falling microstructure probe. Underway measurements were started, for example with the shipboard ADCP, which continuously record data along our cruise track. Preparations for deploying the gliders are fully running. Among other things, the ballasting of the devices was checked in the ship's own test basin on Saturday. In the night to Sunday, the weather became somewhat more rougher and the swell increased, but by the time we



The research vessel METEOR on our test station during its transit from the Azores to the research area east of Newfoundland (photo: Kaja Scheliga).



Left: Recovery of CTD and Watersampler at the end of a test station. Right: Test of Slocum Glider (photos: Christian Mertens).

reached the work area on Sunday morning, the weather had already begun to calm down, and we were able to start our our observational program along a CTD section at 47°N without any problems. More information about our research activities and life on board can be found in the forthcoming blog posts (https://epoc-eu.org/our-work/expeditions/m212/).

Best wishes from the scientific party of M212 to all families, friends, and colleagues on shore.

Christian Mertens
(University of Bremen)