

MSM121

Nuuk – Ponta Delgada

September 23 – October 16, 2023

Weekly Report No. 1

(September 23 – September 24, 2023)



Expedition MSM121 of RV Maria S. Merian is a contribution to the coordinated Horizon Europe project EPOC (epoc.blog.uni-hamburg.de). EPOC stands for *Explaining and predicting the ocean conveyor* and is a collaborative effort by 21 partners and associate partners, including French, German and Norwegian universities and research institutions, as well as associate partners from the UK, US and Canada. The cruise marks the beginning of a 2-year field experiment that forms part of EPOC's work on determining over what regions and on what timescales the large-scale Atlantic Meridional Overturning Circulation (AMOC) behaves as a coherent circulation pattern, as opposed to where coupled atmosphere-ocean or internal ocean processes lead to incoherent behaviour.

The Merian will work in the so-called Transition Zone (TZ) between the subtropical and the subpolar North Atlantic, where ocean models show a breakdown of the meridional coherence of the AMOC. In the research area around the Grand Banks of Newfoundland and Flemish Cap the warm and salty North Atlantic Current (NAC) flows northward close to the opposing so-called Deep Western Boundary Current (DWBC) that is colder and fresher. Together they form an essential part of the AMOC and contribute significantly to the transports of heat and freshwater in the North Atlantic. Interactions between the two currents potentially influence the DWBC and affect its coherence along the path around Flemish Cap and the Grand Banks. During the cruise, a total of nine moorings will be deployed across the continental slope north of Flemish Cap and south of the Grand Banks. An array of compact pressure-inverted echo sounders (PIES) will be deployed south of Flemish Cap. Recovery of the instruments is planned for 2025.



The research vessel Maria S. Merian in the port of Nuuk with the top floats for the moorings on the aft deck (photo: C. Mertens).



The research vessel Maria S. Merian in the port of Nuuk (photo: C. Mertens).

Our team is formed by 18 scientists from the Universities of Bremen and Hamburg, the Institut Français de Recherche pour l'Exploitation de la Mer (Ifremer) in Brest, and the ETH in Zurich. Upon arrival in Nuuk we experienced a nasty surprise: One of the containers with mooring material had not arrived on the Merian for reasons not yet fully clarified. The equipment that is now missing is mainly the weights used as anchors for the moorings. Without anchors, the instruments cannot be deployed. Replacements were not available in Nuuk and waiting for delivery of the container would have meant a delay of at least six days. Fortunately, and through the great support from the ship and the control center for German research vessels, an alternative was found within a short time: St. John's, Newfoundland, has the missing material available. The detour via St. John's means only a small loss of time, which we can already partly compensate by starting the cruise earlier than planned.

We left the port of Nuuk, on Friday, September 22, at 17:30 local time for the transit to St. John's. Underway measurements (e.g. shipboard ADCP) were started a few hours later. Thanks to the calm weather, we are currently making rapid progress and will reach St. John's on Tuesday, September 26 in the afternoon. More information about our research activities and life on board can be found in the forthcoming blog posts (<https://epoc.blogs.uni-hamburg.de/our-work/expeditions/msm121/>).

Best wishes from the scientific party of MSM121 to all families, friends, and colleagues on shore.

Christian Mertens
(University of Bremen)



On the way out of the port of Nuuk we pass some small ice chunks (photo: C. Mertens).