Energy exchange in the ocean under the microscope

Expedition with research vessel METEOR starts / Team reports from on board in a logbook

Climate models are based on a wealth of processes. To improve climate models, it is necessary to better understand these processes. The necessary data basis is created by targeted observations. One such process is ocean circulation, which is the focus of the expedition SONETT (Synoptic Observations - a Nested approach to study Energy Transfer & Turbulence in the ocean) with the research vessel METEOR, which has just started.

The expedition leads a team of scientists from Montevideo (South America) to the working area in the southeast Atlantic. In this region, they will be able to observe many of the processes that affect energy fluxes in the ocean and the ocean's exchange with the atmosphere. These are core topics in the second phase of the Collaborative Research Center TRR 181 "Energy Transfers in the Atmosphere and the Ocean," funded by the German Research Foundation (DFG) and coordinated at the University of Hamburg and the University of Bremen. Researchers are investigating in various subprojects how energy is transferred between large-scale circulation via eddies and waves to local turbulence in the ocean and atmosphere.

Southeast of the Walvis Ridge in the eastern South Atlantic the so-called Agulhas rings, which are formed at the southern tip of Africa and migrate northward through the Atlantic, meet internal tides generated at the ridge. This clash affects the eddies, the propagation of the internal tidal waves, the mixing of different water masses, and thus the distribution of energy in the ocean.

"The goal of our expedition is to better understand how energy is transferred in the ocean between different scales, from the millimeters of turbulence to the hundreds of kilometers of eddies," says cruise leader Dr. Maren Walter from MARUM and the Institute of Environmental Physics at the University of Bremen.

Researchers from MARUM - Center for Marine Environmental Sciences at the University of Bremen, the University of Bremen, the University of Hamburg, the Institute for Baltic Sea Research Warnemünde (IOW) and the Helmholtz Center Hereon are involved in the project.

More:

Expedition logbook M180 „SONETT“: https://www.marum.de/en/Discover/Logbuch-M180.html

Collaborative Research Center (TRR) „Energy transfers in atmosphere and ocean“: https://www.trr-energytransfers.de/

Contact:

Dr. Maren Walter
Institut für Umweltphysik
MARUM – Zentrum für Marine Umweltwissenschaften der Universität Bremen
E-Mail: maren.walter@uni-bremen.de

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