

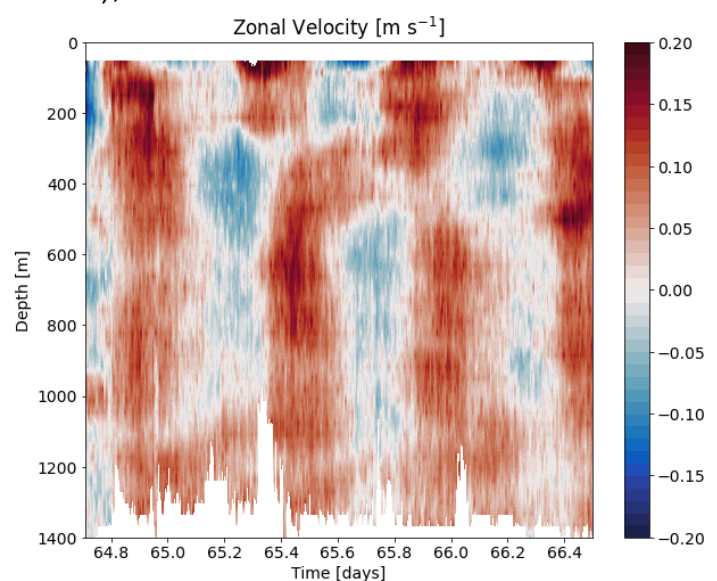
**TRR 181 Expedition
SONETT
RV Meteor M180
23.02. — 14.04.2022
Montevideo — Cape Town**



5. Weekly report (21.03.-27.03.2022)

After completing a few ADCP surveys across three of the ring structures, we started a transect of CTD/microstructure station across a ring from the center to the rim. In addition to the hydrography, samples for noble gas analysis were taken at these stations. These will be later measured in the home lab, and give us information about potential upwelling velocities at the rim of the eddy. After completing this transect, we dedicated some time to look for missing instrumentation: One of our gliders, Comet, has not reported back to the satellite for a while, so we looked out for it in the area where it was supposed to travel, using radio antenna and looking out for its flashlight, but we had no luck. After the search for Comet, we passed again the site of the lost CTD system, and dredged a second time (unsuccessful) for the rosette along with the four kilometer of wire on the seafloor. Although the chances to retrieve it were slim, we had to take the opportunity. Despite the loss of instruments, we have a working CTD system again, combined from our backup instruments and the ships' equipment, operated with a wire and winch usually not intended for CTD work.

On Friday, we proceeded to the mooring array that was deployed here last year during RV Sonne cruise SO283 as part of the SONETT program. The array consists of two full depth moorings equipped with temperature recorders and current meters, as well as five so-called PIES (Pressure Inverted Echo Sounders), that record the travel time of sound pulses between the seafloor and - surface, and hence the density stratification. The aim of the array is to measure internal wave energy fluxes within the tidal beam, and their modification by passing Agulhas rings. During M180, we will acoustically locate the moorings to confirm their exact positions, and carry out CTD profiles for later calibration of the data. The moorings and PIES themselves will be recovered next year during the SONETT II cruise. Until now, we have completed the positioning of one of the moorings, and completed CTD casts at this mooring and at one of the PIES. At the same time, the CTD work to observe internal wave energy fluxes has now started. To this end, we carry out time



Example of the modal velocity structure of the internal tide observed with an ADCP within the tidal beam. Figure: P. Dennert.

series stations consisting of repeat full depth casts of CTD/LADCP alternating with microstructure turbulence measurements over a time of 36 hours or more, to observe the changes in stratification, currents and fluxes over a tidal period. These type of stations will be repeated on different positions within the tidal beam, inside and outside of a ring structure, a program that will keep us busy for the next week.

Kind regards and greetings to all friends, families and colleagues on shore from the scientific party of M180,

Maren Walter
(Bremen University)