POSTRE-II

M135

(1.03. – 08.04.2017)

1. weekly report from March-5-2017

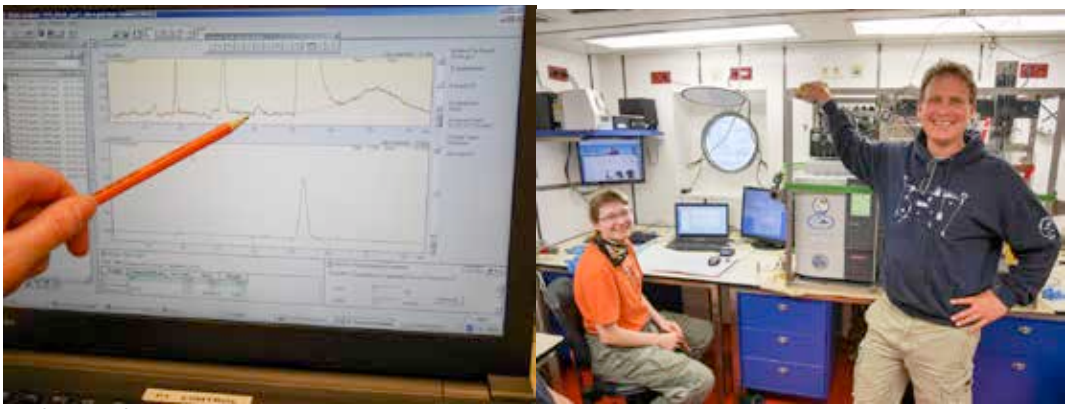
METEOR receives equipment in Valparaiso.

Wednesday March 1st we departed during the evening from Valparaiso in Chile. That was the official beginning of the POSTRE-II expedition which is at the same time the first of a series of expeditions supporting the Kiel based oxygen SFB754. The scientific program calls for an survey along the northwestern corner of Chile and the southern part of Peru out west to the 81°W longitude. We will mostly use a water sampling device on a regular grid with 60 nm spacing. The objective is to map the distribution of a tracer that was released at the end of October 2015 along the Peru margin. At the same time we will obtain a excellent map of the chemical properties of the oxygen minimum zone in the South Pacific. We will also map the currents, temperature and salinity of the Humbold current system and the eddy regime seaward of the coast. Another program will take a few more sediment cores along the Chile-Peru margin after a detailed and careful acoustic sediment mapping. Towards the end of the expedition a few gliders will be released.

We are an international team of scientists from Germany, England, Turkey, China, Peru and Chile and at the same time a healthy mix of technicians, master students, PhD students, postdocs and senior scientist. We are 5 female and 22 male scientist which could be more balanced in the context of equal opportunity.

We depart from Valparaiso during sunset.

METEOR is filled to capacity with containers and boxes for our and the following SFB expeditions. In time for the departure the labs were readied and all equipment was stowed and secured. The first day took us along the 2000m isobaths north always only a few miles offshore from the Chilean coast line. Every 60nm the ship stopped for a hydrographic station. We were very pleased and excited to find some small amounts of our tracer on 100 water depths. The tracer is a non-toxic dissolved gas which is chemically inert and does not react with other substances and as such an ideal substance to label particular water masses. We released the tracer at the end of October 2015 in 250m water depths at three locations directly above the sediment layer. Thus the tracer has been advected southward by the undercurrent over a distance in access of 1500 nm along the South American coastline. Our ocean circulation models had suggested this pathway and the PhD student Madeline Freund, will compare the observations with the model predictions.



Left: the first tracer peak in the chromatogram. Right: Madeleine Freund and Toste Tanuha in the tracer lab with happy faces after the successful tracer detection.

During this cruise we are using two different CTD systems. The ‘normal’ CTD measures salinity, temperature and pressure and in addition dissolved oxygen, chlorophyll and particles. On the outside 24 sampling bottles are mounted that can be closed at any depth remotely. The water will be carefully samples to support the different gas and nutrient measurement programs. The other system is carefully designed to allow to measure metals in the ocean. Thus no metal of the CTD system is allowed to be in direct contact with the ocean and a special Kevlar wire is used to lower the system. At several stations we will deploy both systems to obtain a comprehensive data set.

View of the Atacama desert near 23°S.

Since Saturday evening we have departed from the coast and survey along the first zonal section along 23°S. One last view towards the Atacama desert before only ocean will surround us for the next two days.

The late summer season brings nicely warm weather with temperatures near 20°C and moderate winds from the South. However, the expedition will be under the mostly permanent stratus could deck with limited times of bright sunshine.

The mood on METEOR is excellent, the food enjoyable and the collaboration between the science party and ships captain and crew excellent.

With kind regards from 24° South and 72° West,

Martin Visbeck and the M135 scientific crew.