



Maria S. Merian Cruise 2 leg 1

Second weekly report: 29.05 - 04. 06. 2006

We are progressing north-westward. The first half of the week was characterized by a windy weather and a long Atlantic swell, that affected both the equipment and the crew. From Thursday on, it progressively calmed down to finish with a beautiful week-end, just when we began to encounter the eddies and meanders of the North Atlantic Current. Work performed: 26 CTD stations, 1 VMP profile, 2 free-fall CTD profiles, 4 Provor deployments.

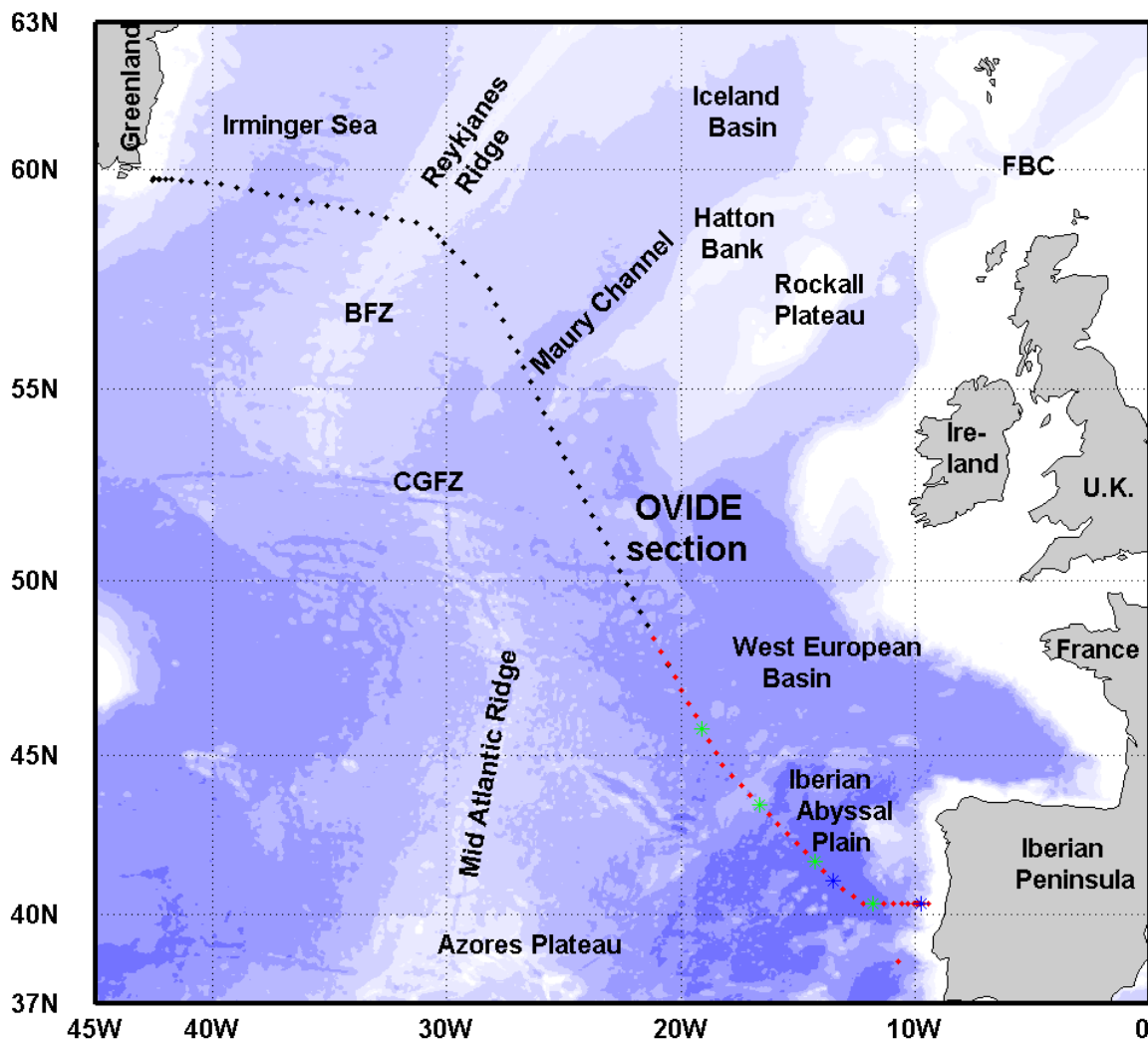
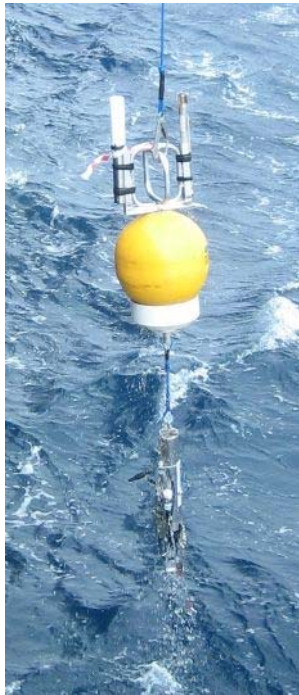


Figure 1: Ovide section planned in 2006. Red dots indicate the hydrological stations performed from May 24 to June 4. The blue stars are the stations where we added a VMP profile, and the green star, the stations where we also deployed a profiling float.

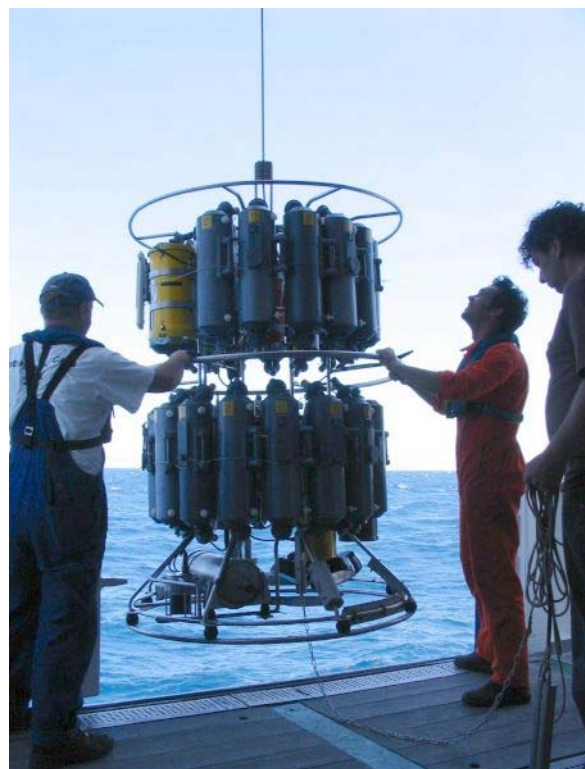
Monday 29 May: “Free-fall CTD and VMP trials”



CTD measurements show a noisy signal, usually attributed to a default in the CTD-wire connection. However, a more serious issue stops our progression: the steering gear of the yellow winch breaks, while the CTD is hanging 4000 meters under our feet. After the replacement of the broken piece, we can slowly come back to the surface and recover all the equipment. The time for repairing is used for instrument trials: the VMP is sent down to 5300m depth, while a new type of free-fall CTD (SBE 19, on the left) is tried twice on 500m deep profiles. All the instruments behave as expected, and the 3 recoveries are perfectly performed. Meanwhile, the CTD is connected to the violet winch that we will use now on.

Tuesday 30 May: “CTD routine settles down”

Five stations and one Provor deployment. Despite the increasing swell and wind, we keep on working hard, and the winch and cable too. Due to the important rolling of the ship, the cable endures several chocks at deployment and recovery of the CTD. We must also interrupt the up-cast several times to correct the spooling on the winch. But data are collected, saved, calibrated, compared.



Wednesday 31 May: "Hold on!"

Rolling speaking, the worse day of the week, consequence of 5m waves and force 7 to 8 winds. We occasionally oscillate on more than 20° on each side. Sometimes, despite our efforts to fix it, the 1-ton rosette jumps on the deck. Meal times are not especially relaxing. The scientists working in the containers located on the outside deck take the closest indoor corridor to avoid the salty shower. But it is quite sunny though ...

At station 25, the end of the CTD upcast is missing: 2 bulbs show the damage of the bad weather on the last 20 meters of the wire. The cable is cut, and the connection rebuilt. Next station is fine. *Alles klar.*

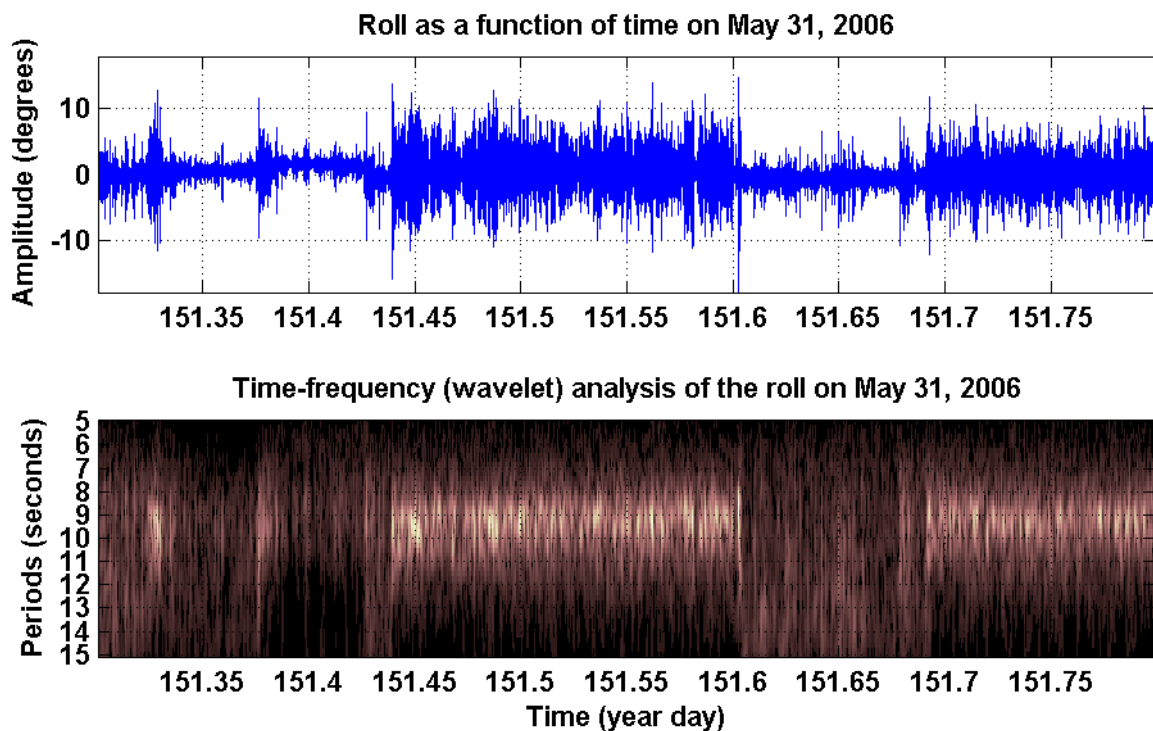


Figure 2: up: Roll as measured by Seapath 200 and decimated every second on May 31. Down: time-frequency diagram of the rolling amplitude. Strongest rolling (light color) appears during stations, mainly around an uncomfortable period of 9.5s. Transit time is much more quiet.

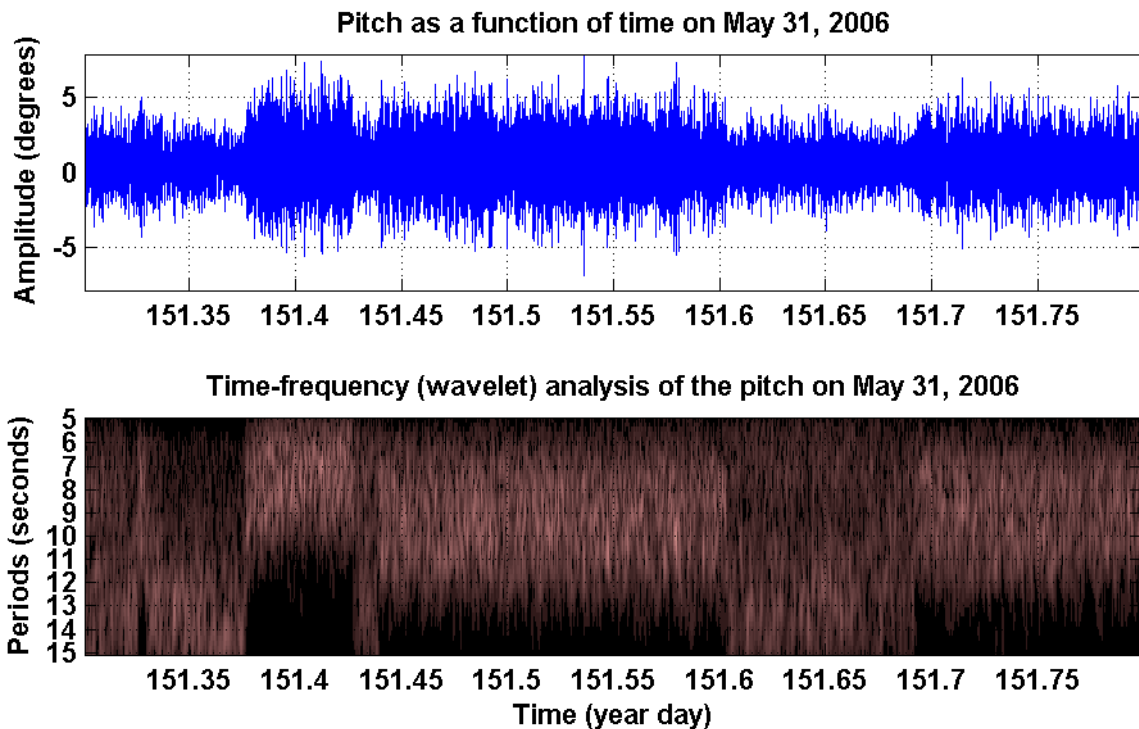


Figure 3: same as figure 2 for pitch. Although the behavior change in station, it does not show any specific peaks and as a matter of fact, we hardly notice it.

We all clearly observe that the Merian rolling behaves as if she was resonating at a period of about 10s. When she begins to roll at this rhythm, the movement slowly builds up for several periods before decaying suddenly. This phenomenon is illustrated with a time-frequency analysis (called continuous wavelet transformation) of the roll (fig. 2) and pitch (fig. 3): while the roll shows repeated peaks at a period of 9.5s, the pitch shows no specific behavior.

Only 3 CTD stations today ... fortunately, the weather forecasts bring hope of better days.

Thursday 1 June: “One of these good days”

5 CTD stations and a Provor deployment. A sane routine finally settles down despite the 3 meter swell. Chemical analysis are performed in real time, with no major failure or delay.

Friday 2 June: “Thanks God It’s Friday”

Yes, TGIF, not so much because of the week-end that follows than because of better meteorological conditions. 4 CTD stations and a Provor deployment today. We pass 46°N and 19°W.

Saturday 3 June: “Wake up, old fellow”

In the afternoon of this beautiful day, our old fellow, the BB150kHz LADCP, refuses to wake up for station 38. To make a long story short: we will have to rely on a smaller, but less efficient, 300kHz LADCP for stations 38 and 39, while the old fellow is repaired in the night, after blowing up 3 fuses... 4 CTD casts were performed today.

Sunday 4 June: “After the winch, the pod... busy Sunday”

No time to get bored on the Merian. Early morning, the chain of the violet winch breaks during the down-cast, at 3200m. One and a half hour later, the winch is repaired and the cast resumed. After some work on the data, we should be able to recover a correct profile of temperature, salinity and oxygen. Later in the evening, alarming messages oblige the crew to stop one of the two pods. Transit speed between stations is reduced from 12 to 9 knots, while engineers and electricians are working hard on the problem. We still gather 4 more profiles of 28 bottles each, and as usual, a Provor is deployed. At the end of the day, we pass north of Brest latitude: 49°N.

Figures 4 and 5 below illustrate part of the work that has been done so far. The ADCP data are excellent despite the weather, and we rely heavily on them for decision making and for future scientific results.

All the scientists of this mission are most grateful to Captain von Staa and to all the crew aboard the Maria S. Merian.

Bien sincèrement,

Pascale Lherminier und alle Fahrtteilnehmer

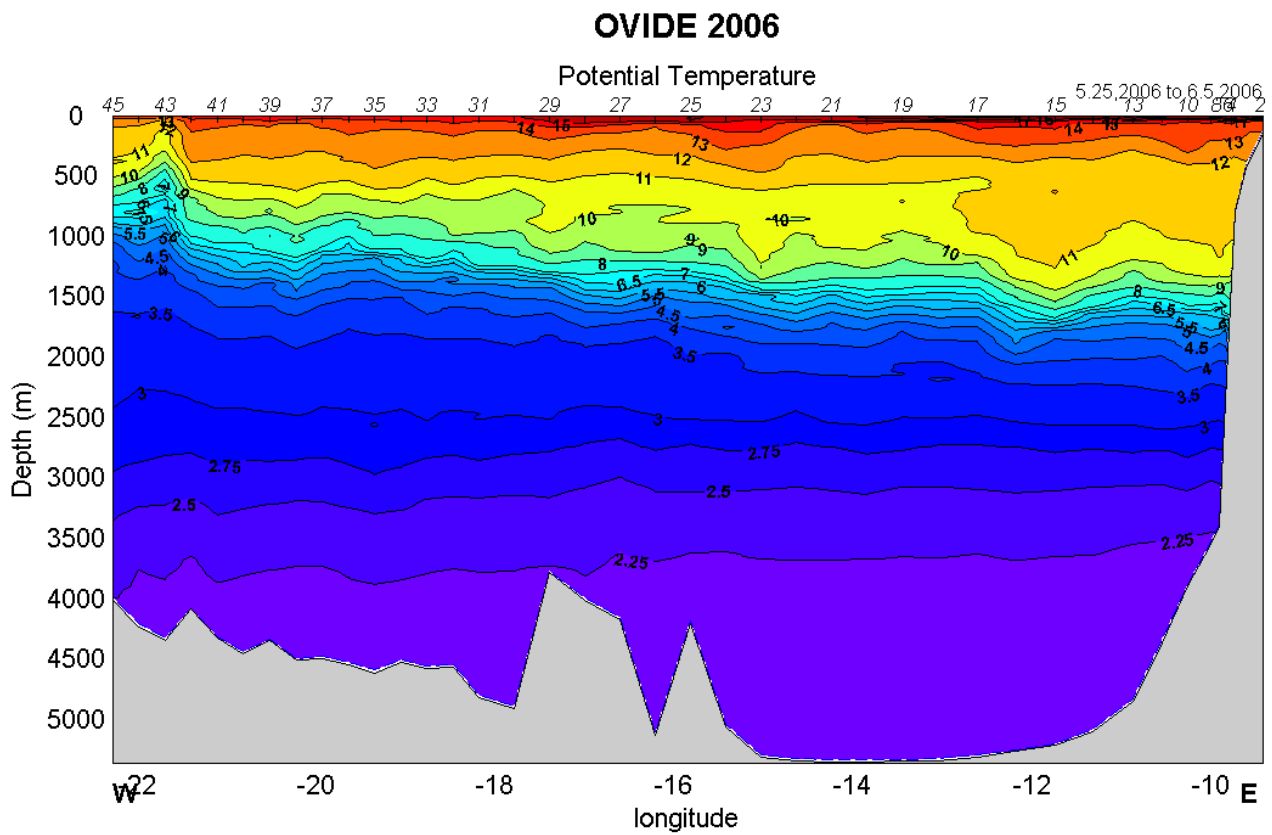


Figure 4: potential temperature section as measured on June 5, 2006.

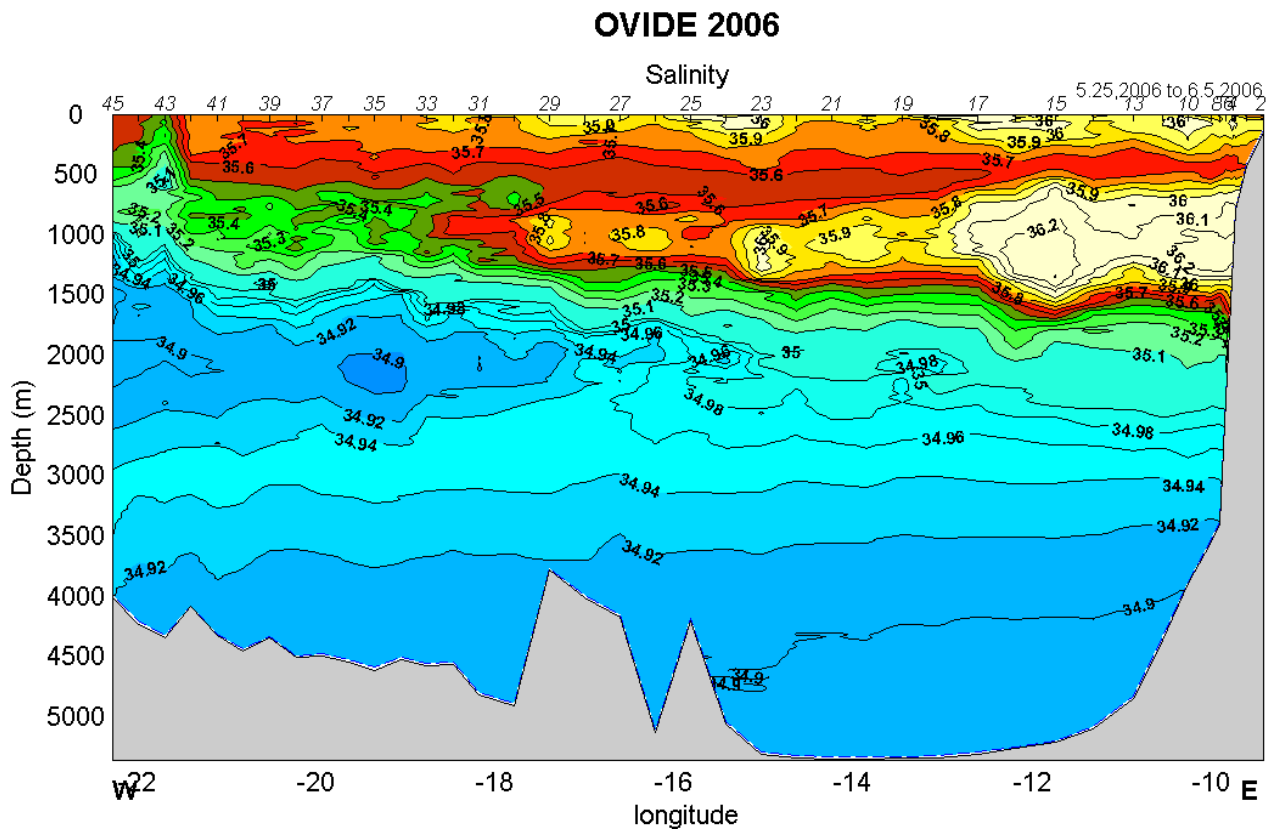


Figure 5: salinity section as measured on June 5, 2006.