

The PIRATA FR28 cruise

Bernard Bourlès,

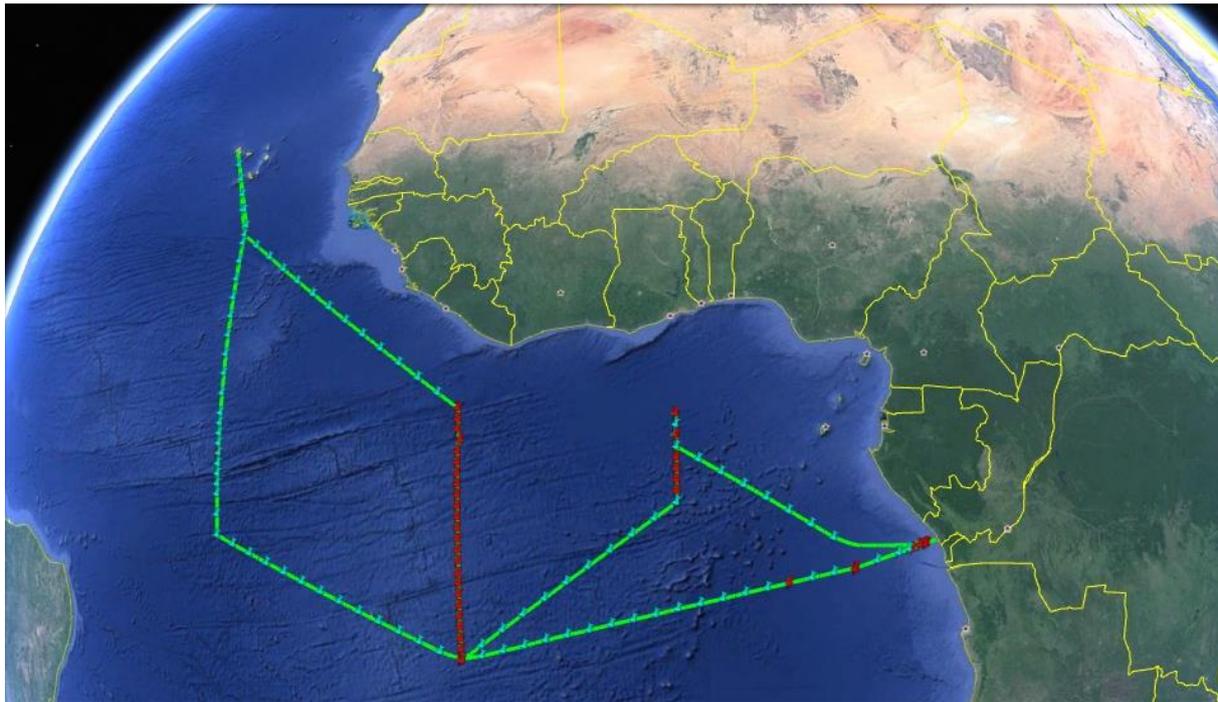
The PIRATA FR28 cruise has just been carried out from February 27th to April 5th, 2018, from Mindelo (Cabo-Verde), onboard the R/V THALASSA. In the frame of the multinational PIRATA observatory, France is in charge of 6 meteo-oceanographic moorings (at 23°W-0°N, 10°W-0°N, 0°E-0°N, 10°W-6°S, 10°W-10°S, 8°E-6°S) and 3 currentmeter (ADCP) moorings (at 23°W-0°N, 10°W-0°N and 0°E-0°N). During this PIRATA FR28 cruise, the PIRATA team successfully replaced every PIRATA buoys, along with the CO₂ parameters sensor installed at 10°W-0°N and 8°E-6°S.

This cruise ADCP was also the 1st servicing of the ADCP mooring deployed in 2016 at 0°E-0°N as contribution to the PREFACE EU program. The ADCP mooring perfectly worked, so offering a full two years data set of current measurements from the surface down to about 300m depth. It was then successfully replaced and will be serviced again in 2020.

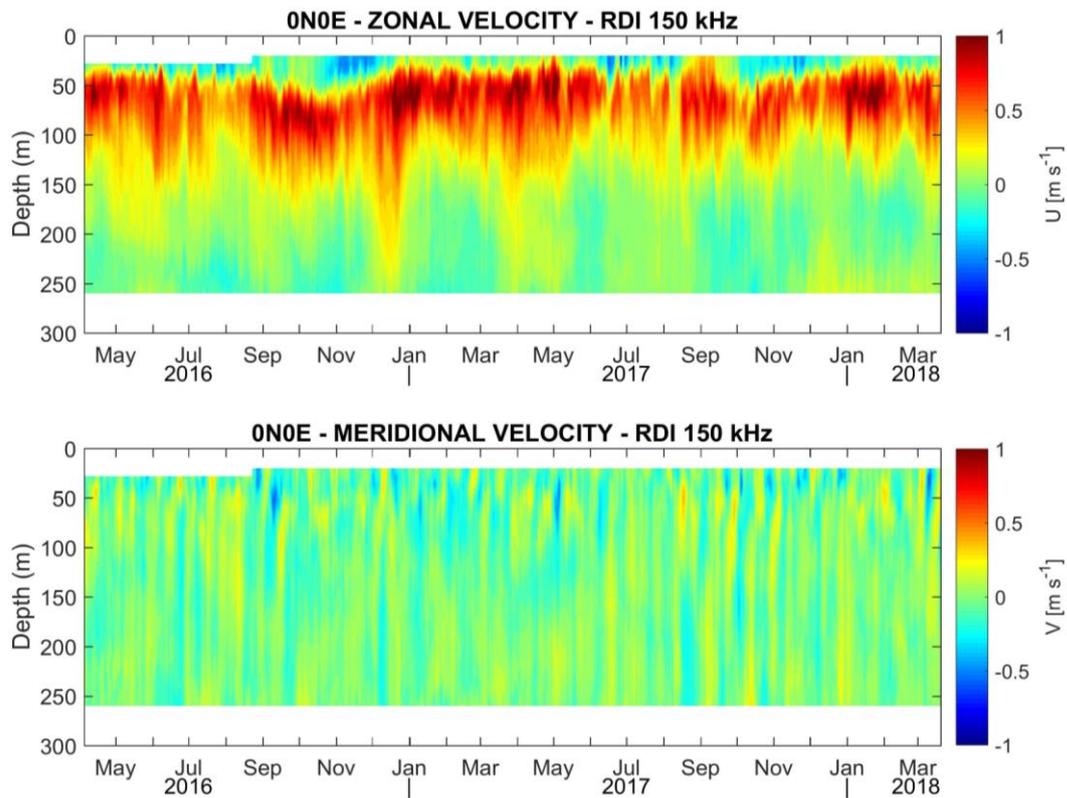
During this cruise, 44 CTDO₂-LADCP profiles were carried out, about 500 sea water samplings (at the surface and during CTDO₂/LADCP profiles) were taken to analyze salinity, dissolved oxygen, nutrients, carbon parameters (DIC et TA) and primary production (Chlorophyll pigments), 101 temperature profiles obtained with XBT, and continuous measurements, all along the trackline, were obtained from the R/V thermosalinograph, the FerryBox, the ADCP (38kHz), acoustic sounders (EK80, 6 vertical and one transversal) and the met station. CTD and XBT profiles were transmitted in quasi-real time to CORIOLIS for operational centers. Also, biological species (as Sargassum, shells on the buoys etc.) have been sampled for taxonomy, biological and possibly microplastic analysis. The servicing of the acoustic receivers (OTN) installed from 2014 on each PIRATA buoys, has also been ensured and the turbulence sensors (Xpods) installed from 2014 at 23°W-0°N and 10°W-0°N (5 on each mooring between 20m and 80m) were also replaced (collaboration with Oregon State University, Corvallis, USA ; PI: Jim Moum).

In addition to these operations, PIRATA-FR cruises also constitute platforms for additional contributions to other Tropical Atlantic observing systems. During PIRATA FR28, 13 SVP-B (drifters equipped with atmospheric pressure sensor) were deployed, mostly in the poorly documented Gulf of Guinea, as a Meteo-France contribution to the AtlantOS WP3.6. Also, 10 SVP were deployed for NOAA (AOML) as contribution to the Global Drifter Program. PIRATA FR28 has also been the opportunity to deploy, as Argo-France contribution to the AtlantOS WP3.1 and for the 1st time in the Tropical Atlantic, 2 Deep-Argo (4000m) at 6°38'S - 5°E and 0°01'N-9°51'W, both equipped with T, S and O₂ sensors and with Iridium data transmission. Three other Argo (2000m) were deployed in the equatorial band along 0°E. All are with double configuration (so also allowing some profiles every two days during three months from the surface down to 500m or 1000m depth).

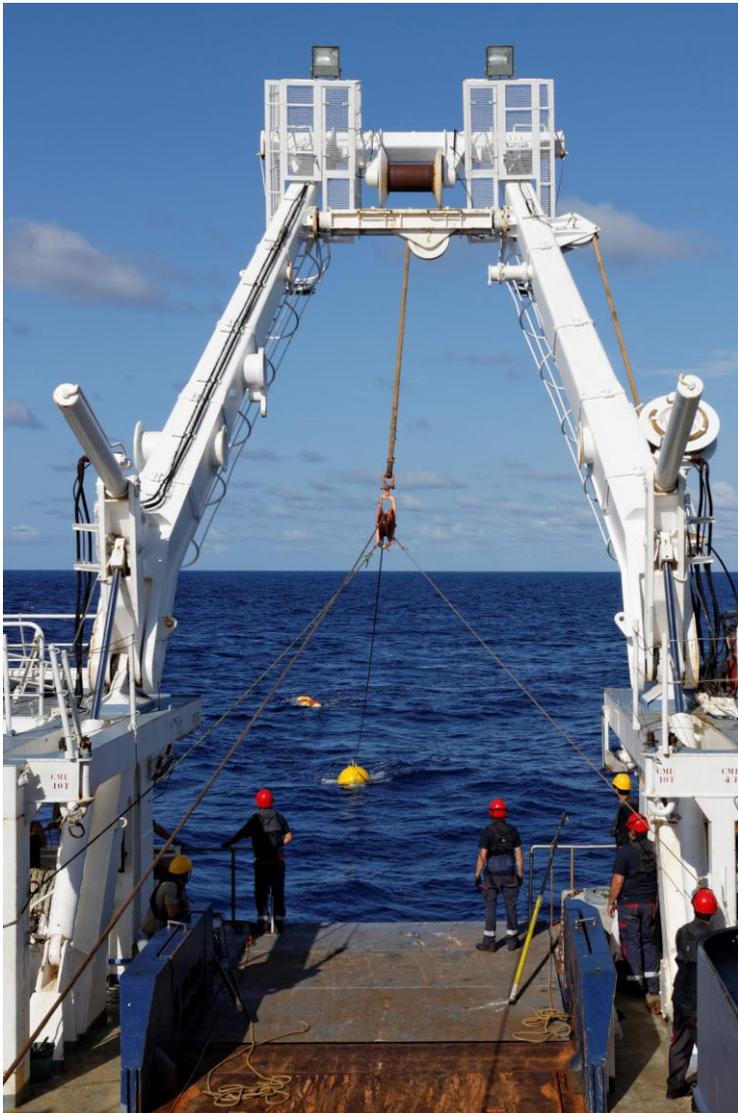
These successful operations prove once again that PIRATA, through its yearly cruises carried out by USA, Brazil and France, are very relevant plat-forms for several kinds and operations and should be optimized in this way, also in order to valorize as possible the vessel time costs that are the most expensive components for a long-term monitoring observing system.



Map of the PIRATA FR28 track line (green line) with positions of CTDO2/LADCP casts (red dots) and XBT (blue dots). See also <http://www.brest.ird.fr/us191/cruises/pirata-fr28/> for more details on the works done during the PIRATA FR28 cruise.



Zonal (up) and meridional (down) components of the current as measured from April 4, 2016 to March 20, 2018 with the ADCP mooring at 0°N-0°E (Courtesy: P.Rousselot, IRD).



0-0 ADCP mooring retrieval operations on March 20, 2018.



A Deep-Argo profiler just after its deployment at 10°W-0°N, close to the just serviced ATLAS buoy observed on the left of the R/V Thalassa (Courtesy: B.Bourlès, IRD).

