

BOUSSOLE Monthly Cruise Report

Cruise 186

August 12-13, 2017

Duty Chief: Melek Golbol (golbol@obs-vlfr.fr)

Vessel: R/V Téthys II
(Captain: Dany Deneuve)

Science Personnel: Melek Golbol and Eduardo Soto Garcia.

Laboratoire d'Océanographie de Villefranche (LOV), 06230 Villefranche-sur-Mer, France



Two *Téthys-II* crewmembers are spooling a fishing longline, which was hooked on the BOUSSOLE buoy.

BOUSSOLE project

ESA/ESRIN contract N° 4000119096/17/I-BG

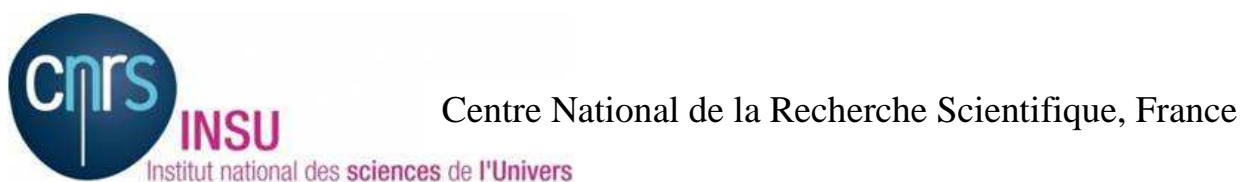
August 31, 2017



Foreword

This report is part of the technical report series that is being established by the BOUSSOLE project.

BOUSSOLE is funded and supported by the following Agencies and Institutions



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Cruise Objectives

Routine operations

Multiple Biospherical's C-OPS (Compact Optical Profiling System) radiometric profiles are performed at the BOUSSOLE site around solar noon, under optimal conditions: clear blue skies and flat, calm sea surface. If the sky is clear and sea conditions are reasonably calm (no whitecaps or large swell), hand held CIMEL sun photometer measurements are to be performed consecutively where possible with C-OPS profiles. If sea conditions are poor but sky is good, hand held CIMEL sun photometer measurements can be made at intervals throughout the day to measure atmospheric optical thickness. CTD deployments are required at the start and the end of the C-OPS profiling day and around noon in the longer summer days or when there is a high possibility of a satellite matchup. The CTD package also includes a Chl fluorometer. Additional instrumentation for measurement of inherent optical properties has been added from December 2011. The package includes a hyperspectral absorption meter (Hobilabs a-sphere), a multispectral backscattering meter (Hobilabs Hydrosat-6) and a multispectral beam transmissometer (Hobilabs Gamma-4). Two CTD casts are to be performed at each data acquisition at the BOUSSOLE site: one cast with, and one cast without, a 0.2 μ m filter added on the a-sphere for the dissolved matter absorption measurements.

Seawater samples are to be collected, filtered and stored into liquid nitrogen for subsequent HPLC pigment and particle absorption spectrophotometric filter analysis in the lab. Three replicates samples are to be collected at surface for total suspended matter weighting in the lab.

Divers check the underwater state of the buoy structure and instrumentation, take pictures for archiving, clean the sensor optical surfaces, and then take again some pictures after cleaning. Divers also put a neoprene cap on the backscattering meter and on the transmissometers for acquiring dark measurements (started in April 2009).

In addition, water samples are to be collected at two depths (5 m and 10 m) for dissolved oxygen (DO), total alkalinity (TA) and total inorganic carbon (TC) analysis (from March 2014). This operation is part of the BIOCAREX ANR project, in collaboration with the LOCEAN in Paris (J. Boutin and collaborators). The TA/TC samples will be processed by the National service for such analyses (SNAPOCO – LOCEAN in Paris). The results will allow checking the data collected by the two pCO₂ CARIOCA sensors installed on the buoy at 3m and 10m.

Further details about these operations and the data collection and processing protocols are to be found in: Antoine, D. M. Chami, H. Claustre, F. D'Ortenzio, A. Morel, G. Bécu, B. Gentili, F. Louis, J. Ras, E. Roussier, A.J. Scott, D. Tailliez, S. B. Hooker, P. Guevel, J.-F. Desté, C. Dempsey and D. Adams. 2006, BOUSSOLE: a joint CNRS-INSU, ESA, CNES and NASA Ocean Color Calibration And Validation Activity. NASA Technical memorandum N° 2006 - 214147, 61 pp.
(http://www.obs-vlfr.fr/Boussole/html/publications/pubs/BOUSSOLE_TM_214147.pdf)

Additional operations

Two water samples for cytometry analysis were collected at 10 m depth in the frame of a collaboration with Collin Roesler (Bowdoin College, Maine, USA), about the installation of an ECO 3X1M multi-channel fluorimeter on the BOUSSOLE buoy at 9 m depth.

Cruise Summary

The first day was used for optical profiles, for CTD casts with water sampling, for CIMEL measurements and for a Secchi disk at the BOUSSOLE site. The second day was used for CTD casts with water sampling, for optical profiles and for a Secchi disk at the BOUSSOLE site. During the cruise, we noticed that a fishing longline was hooked on the BOUSSOLE buoy. The line was removed by the *Téthys II* crew the second day.

Saturday 12 August 2017

The sea state was slight with a gentle breeze. The sky was blue and the visibility was excellent. This day, 3 C-OPS profiles, 3 CIMEL measurements, 1 Secchi disk and 2 CTD casts with water sampling at the BOUSSOLE site were performed at the BOUSSOLE site. The second CTD cast was performed with a 0.2 μm filter on the a-Sphere absorption meter and with a cap on the backscattering meter for dark measurements.

Sunday 13 August 2017

The sea state was slight with a light breeze. The sky was overcast, yet the visibility was excellent. Two CTD casts with water sampling were performed at the BOUSSOLE site. The first CTD cast was performed with a 0.2 μm filter on the a-Sphere absorption meter. Between the two CTD casts, the dinghy was deployed and crewmembers went next to the BOUSSOLE buoy to remove a fishing longline which was hooked on the mooring. Then, 1 Secchi disk and 2 C-OPS profiles were performed at the BOUSSOLE site before returning to the Nice harbour.

Pictures taken during this cruise can be found at:

<https://get.google.com/albumarchive/114686870380724925974/album/AF1QipOOMYK3jNkw5GRt7-XeKDMHigApOG-RK11vZL8l>

Data from the BOUSSOLE cruises and buoy are available at:

http://www.obs-vlfr.fr/Boussole/html/boussole_data/login_form.php

Cruise Report

Saturday 12 August 2017 (UTC)

People on board: Melek Golbol and Eduardo Soto Garcia.

0630 Departure from the Nice harbour.
1030 Arrival at the BOUSSOLE site.
1055 C-OPS 01, 02, 03.
1155 CTD 01, 400 m with water sampling at 400, 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC and a_p .
1200 CIMEL 01, 02, 03.
1225 Secchi 01, 23 m.
1300 CTD 02, 400 m with water sampling at 5 m for TSM (with 0.2 μm filter on a-Sphere and cap on HS-6).
1330 Departure to the Nice harbour.
1715 Arrival at the Nice harbour.

Sunday 13 August 2017 (UTC)

People on board: Melek Golbol and Eduardo Soto Garcia.

0545 Departure from the Nice harbour.
0915 Arrival at the BOUSSOLE site.
0920 CTD 03, 400 m with water sampling at 10 and 5 m for TSM, TA/TC and O_2 (with 0.2 μm filter on a-Sphere).
0950 Removing of the longline.
1045 CTD 04, 400 m with water sampling at 400, 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p and cytometry.
1115 Secchi 02, 20m.
1130 Filtrations.
1230 C-OPS 04, 05.
1300 Departure to the Nice harbour.
1640 Arrival at the Nice harbour.

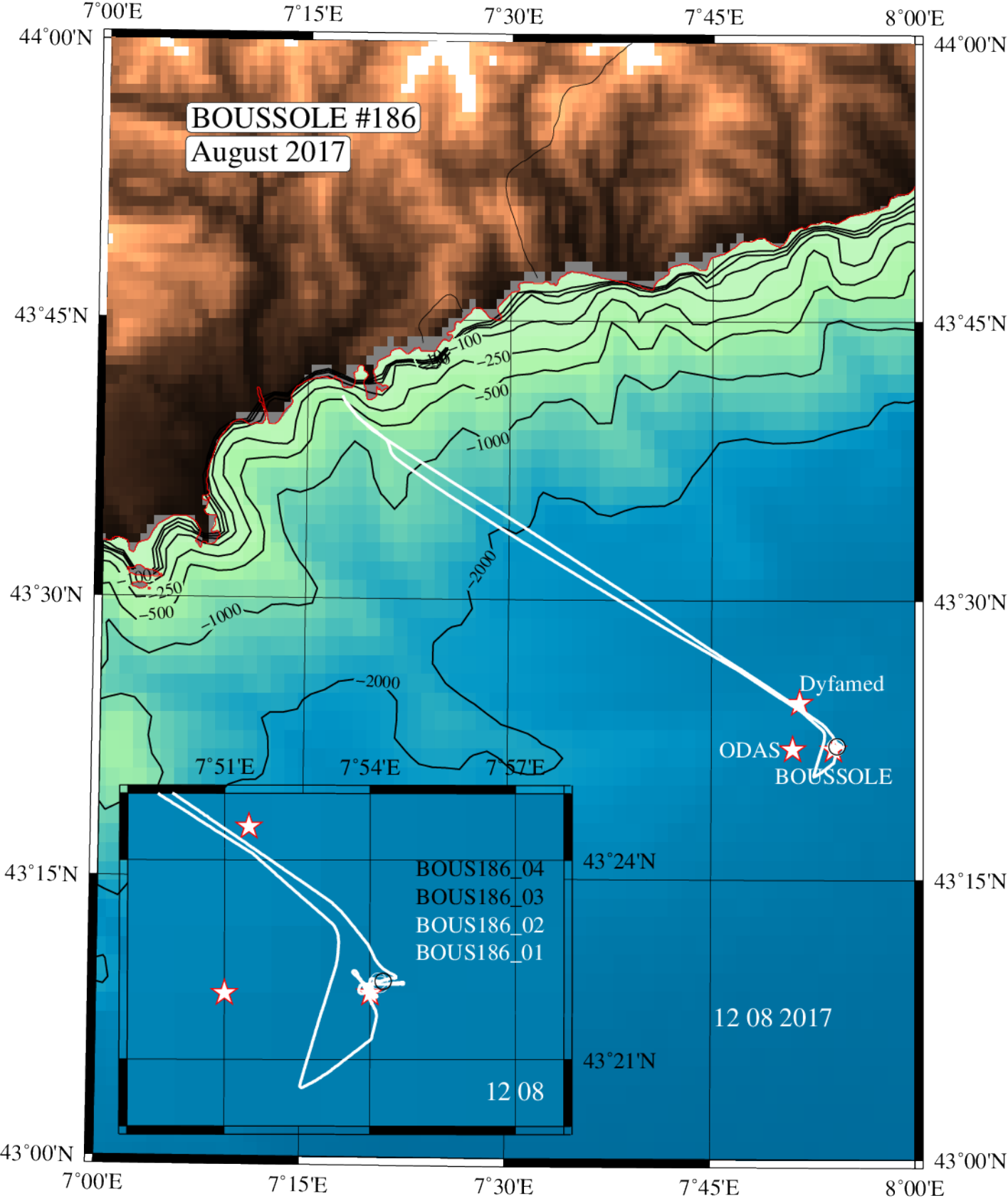
Problems identified during the cruise

- A fishing longline was hooked on the BOUSSOLE buoy. The line was removed by crewmembers the second day.
- The second day, only 2 C-OPS profiles could be performed because the sky conditions were not optimal (many clouds and unstable irradiance).
- The diving operations were not performed during the cruise because an intermediate cruise with a private boat was organized four days before the beginning of this cruise to maintain the buoy.
- The navigation and thermosalinograph data from the *Téthys II* were not available the second day because of a problem in the acquisition system and the pump of the thermosalinograph was not switched on.

Appendices

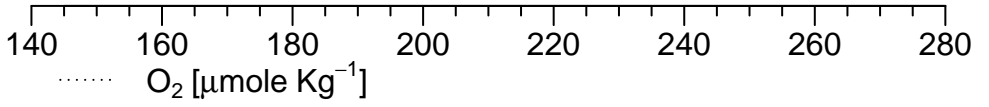
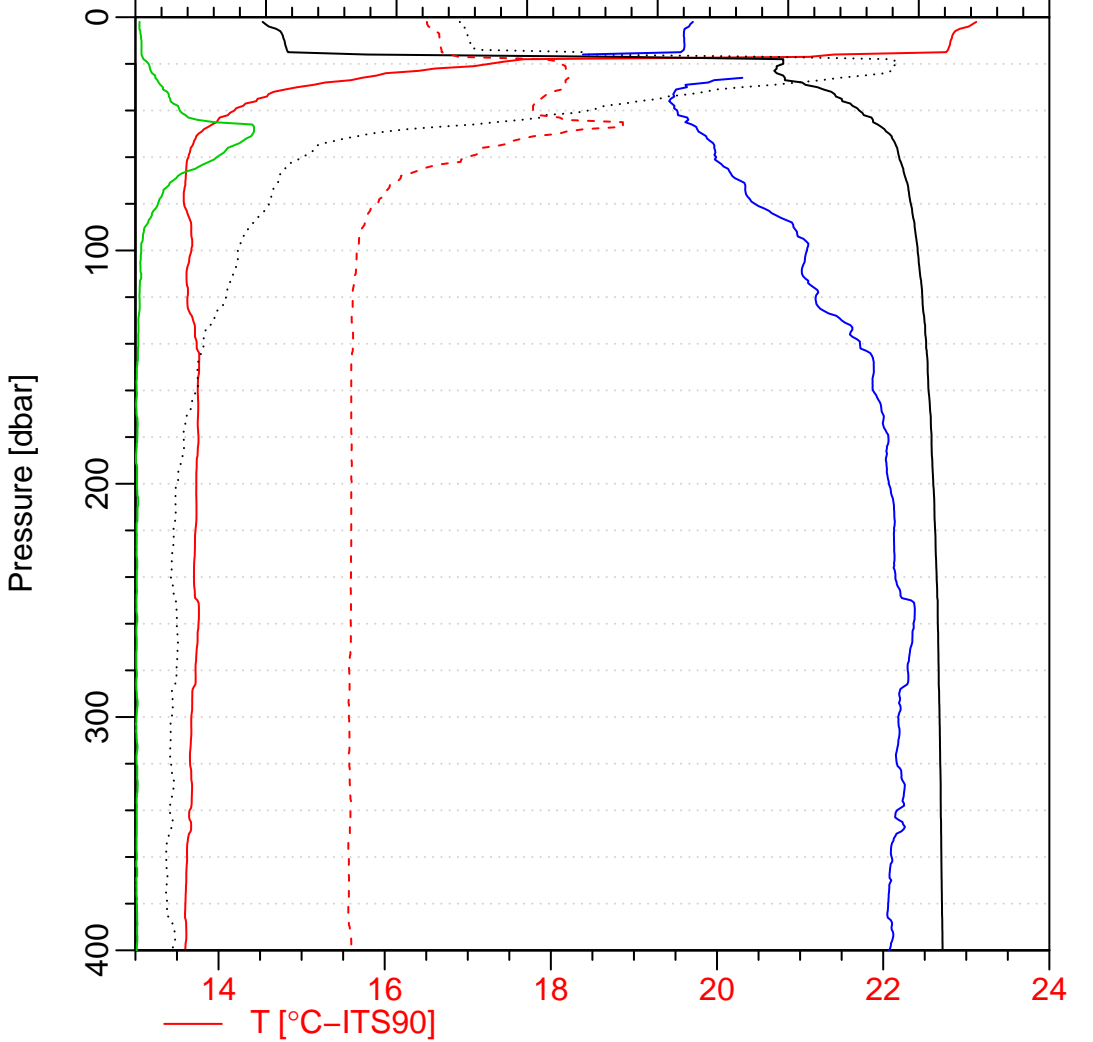
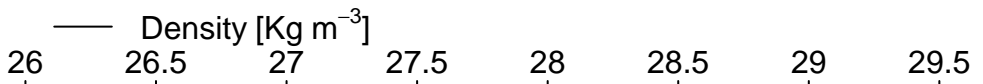
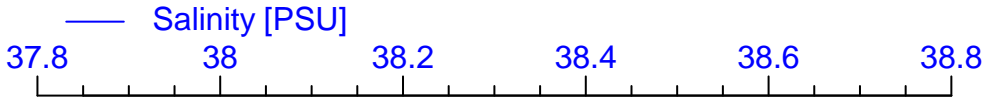
Cruise Summary Table for Boussole 186

Date	Black names (file ext: ".raw")	Profile names (file extension: ".raw")	CTD notes	Other sensors	Start Time		Depth max (meter)	Latitude (N)			Longitude			Weather		Atm. Pressure (hPa)	Humidity (%)	Visibility	T air	T water	Sea		Swell dir.	Whitecaps	
					GMT (hour.min)	Duration (min.sec)		(Degree)	(Minute)	(Degree)	(Minute)	Sky	Clouds	Quantity (#/8)	Wind sp. (kn)						Wind dir.	Swell H (m)			Swell dir.
12/08/17		bou_c-ops_170812_1045_001_data.csv			10:53	4:42	114	43	21.834	7	54.049	blue	None	0	10	248	1016.9	65	excellent	21.8		calm	0.6	few	
		bou_c-ops_170812_1045_004_data.csv			11:08	4:30	110	43	22.035	7	53.916	blue	None	0	10	248	1016.9	65	excellent	21.8		calm	0.6	few	
		bou_c-ops_170812_1045_005_data.csv			11:19	4:30	109	43	22.173	7	53.823	blue	None	0	10	248	1016.9	65	excellent	21.8		calm	0.6	few	
			BOUS186_01			11:53	27:00	400	43	22.136	7	54.212	blue		1	10	242	1016.7	62	excellent	21.9	23.11	calm		
				HPLC & Ap	12:03	4:00		43	22.132	7	54.325	blue		0			1016.6								
				CIMEL01	12:11	2:00		43	22.132	7	54.325	blue		0			1016.7								
				CIMEL02	12:16	3:00		43	22.132	7	54.325	blue		0			1016.7								
				CIMEL03	12:25	4:00	23	43	22	7	54	blue		1					excellent						
			Secchi01	13:00	21:00	400	43	22.181	7	54.173	blue		1	9	229	1016.6	54	excellent	22.4	23.22	calm				
13/08/17																									
			BOUS186_03	O2, TA/TC & TSM	09:20	4:00	400	43	22.168	7	54.274	cloudy		3-4	3	244	1019.1	70		22.6	23.15	calm			
			BOUS186_04	HPLC, Ap & Cyto	10:45	29:00	400	43	22.183	7	54.272	overcast		6	1	246	1019.3	67		22.9	23.051	calm			
				Secchi02	11:15	4:00	20	43	22	7	54	overcast		6					excellent						
			bou_c-ops_170813_1222_001_data.csv			12:31	4:14	100	43	22.160	7	53.978	overcast	Cs	6	3	67	1018.8	67	excellent	23.0		calm	0.5	no
		bou_c-ops_170813_1222_002_data.csv			12:43	4:32	108	43	22.392	7	53.817	cloudy	Cs	5	3	67	1018.8	67	excellent	23.0		calm	0.5	no	



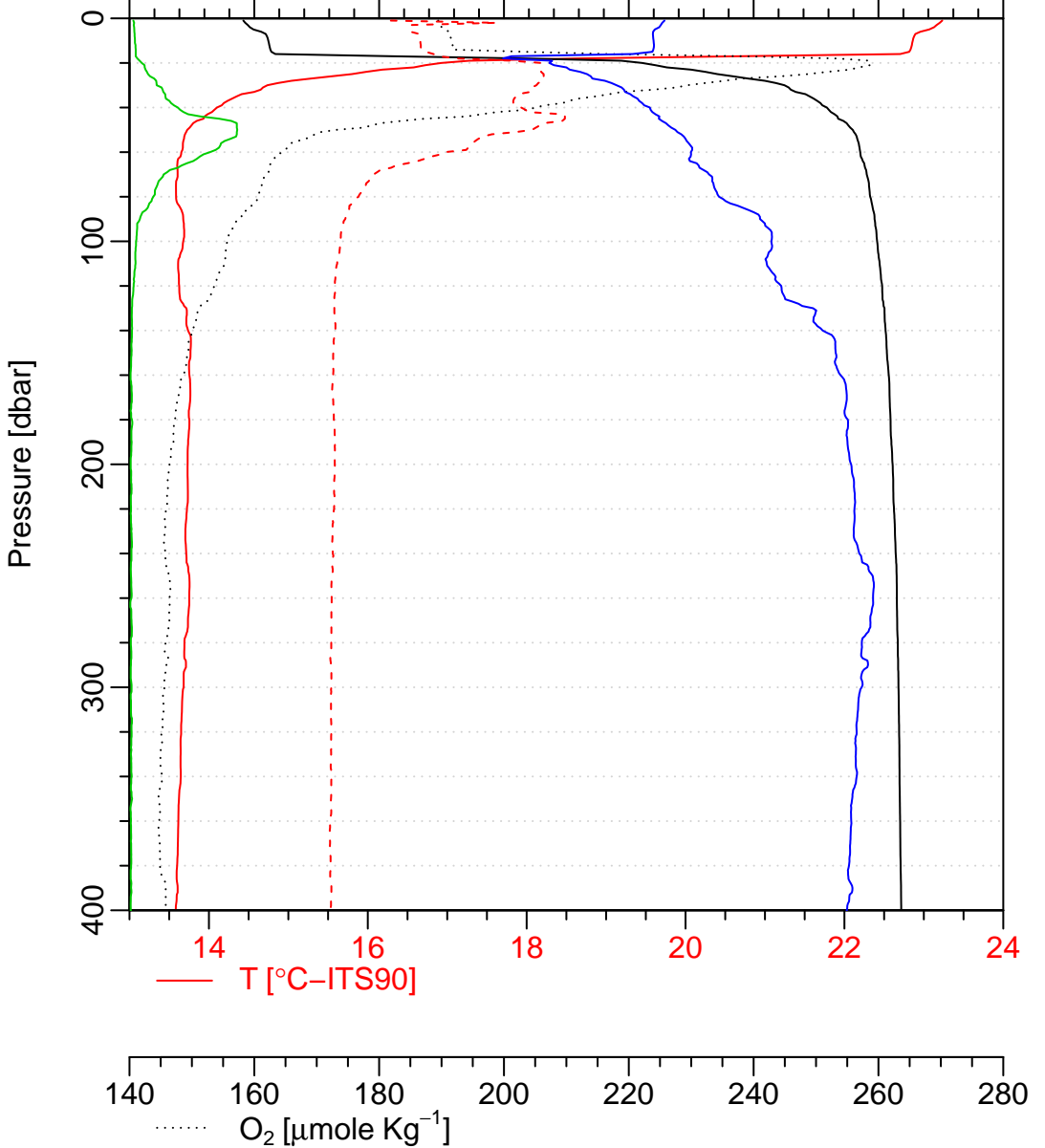
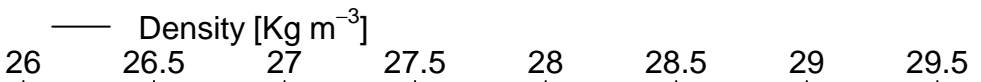
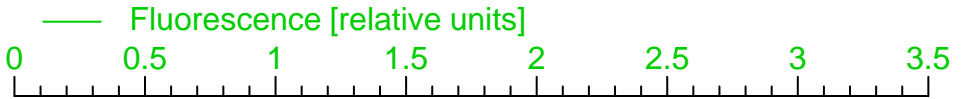
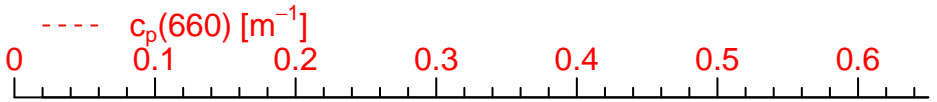
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Latitude = 43 22.130 N



bous186_02

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Heure debut [TU] = 13:00
Longitude = 007 54.173 E
Latitude = 43 22.181 N



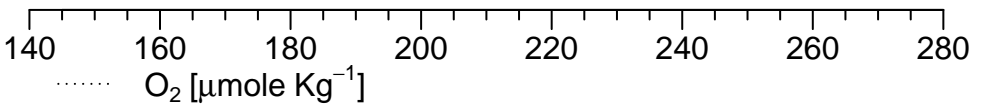
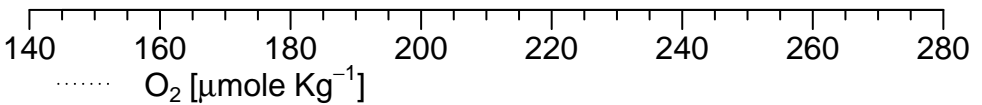
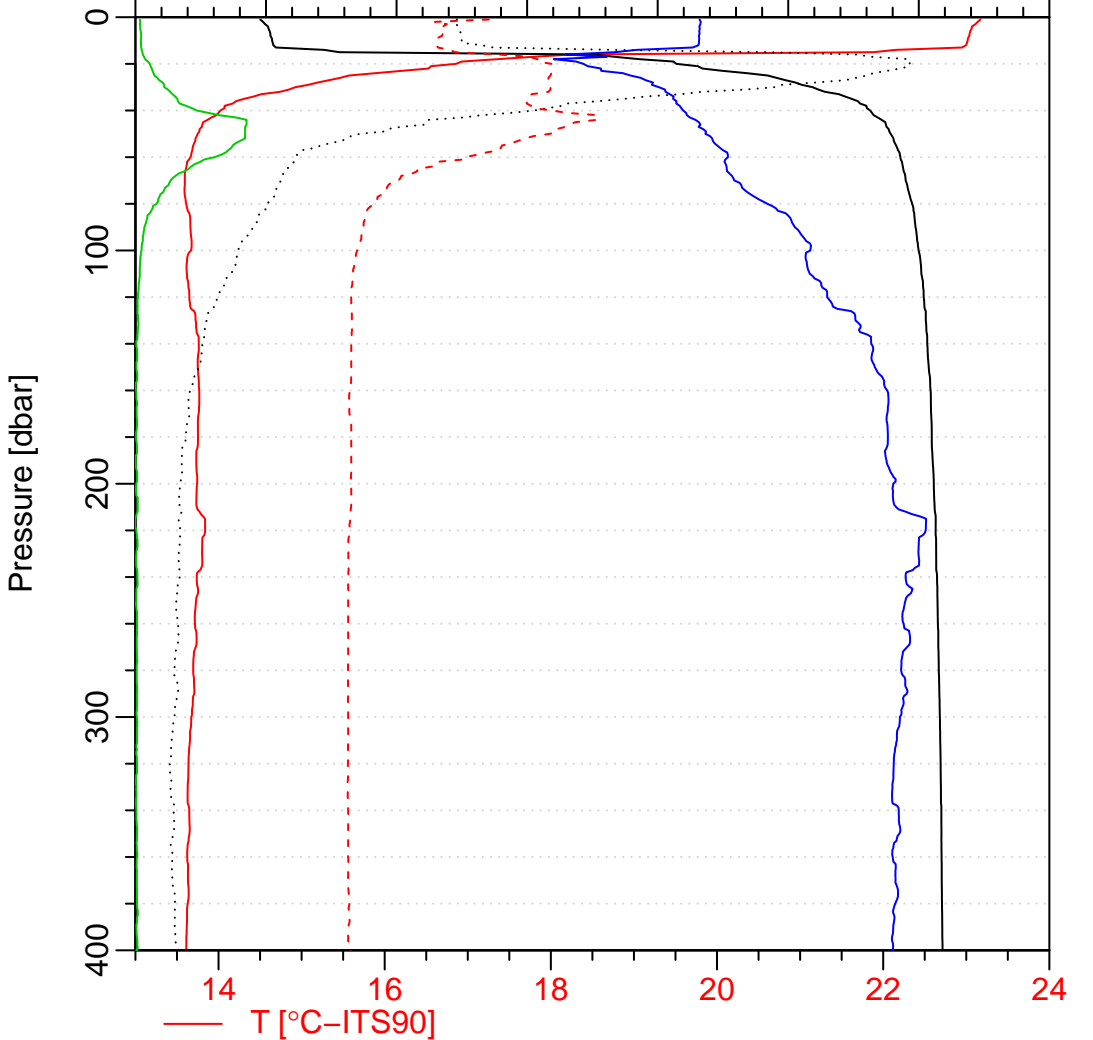
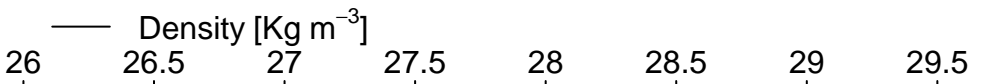
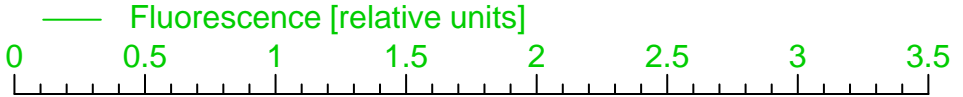
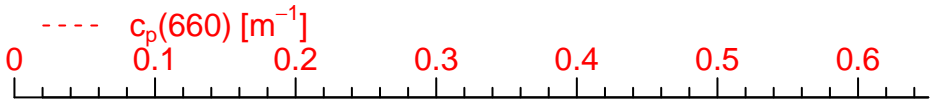
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Latitude = 43 22.168 N



bous186_04

Date = 13/08/2017
Heure debut [TU] = 10:45
Longitude = 007 54.272 E
Latitude = 43 22.183 N

