

BOUSSOLE Monthly Cruise Report

Cruise 125

July 12 - 16, 2012

Duty Chief: Emilie Diamond (diamond@obs-vlfr.fr)

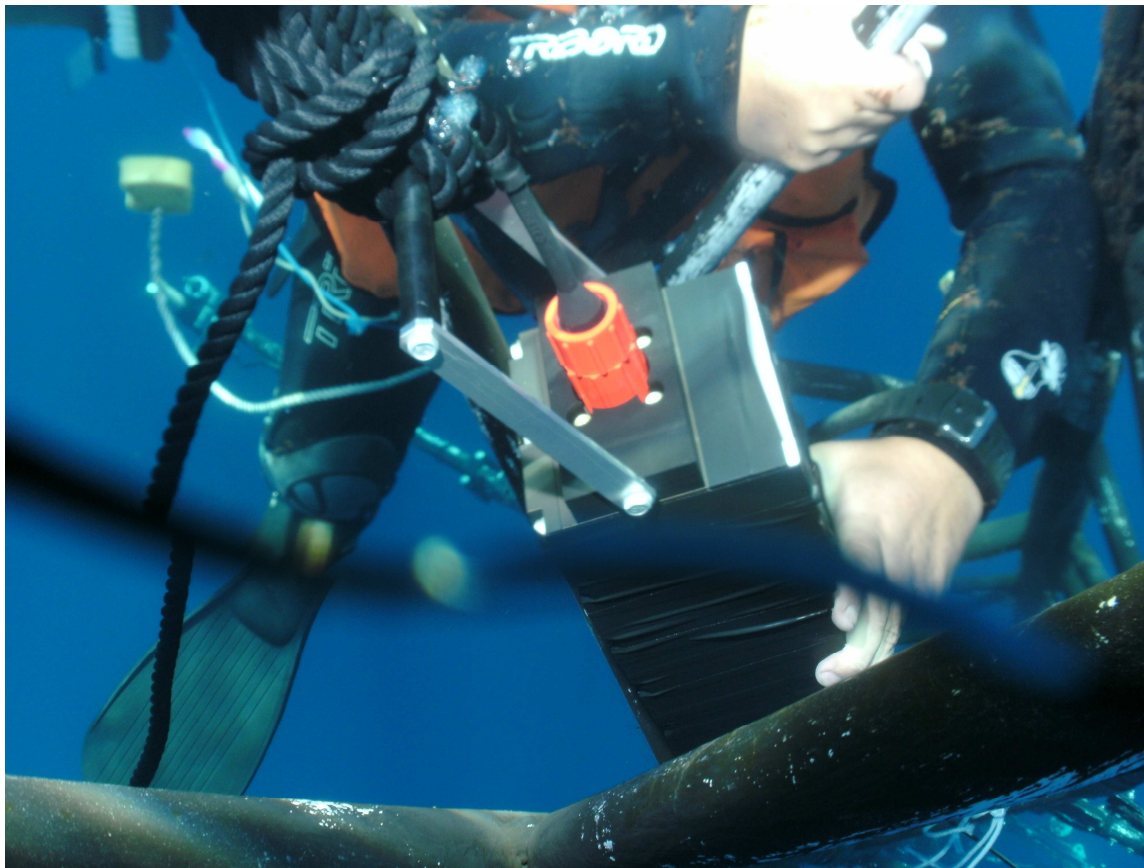
Report written by Melek Golbol (golbol@obs-vlfr.fr)

Vessel: R/V *Téthys II*

(Captain: Rémy Lafond)

Science Personnel: Sophie Bellaiche, Florent Besson, Emilie Diamond, Yves Lamblard, Grigor Obolensky, Frédéric Quignaux and Emmanuel (diver).

Laboratoire d'Océanographie de Villefranche (LOV), 06238 Villefranche sur mer cedex, FRANCE



Divers installing a prototype of pCO₂ CARIOCA sensor on the buoy, under the water surface.

BOUSSOLE project

ESA/ESRIN contract N° 13226/10/I-NB

July 30, 2012



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

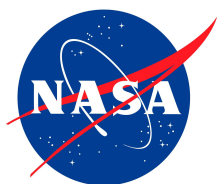


European Space Agency



Centre National d'Études Spatiales, France

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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 Wetlabs CDOM fluorometer and a Chl fluorometer, an absorption-attenuation meter (Wetlabs AC9; from July 2002), and a backscattering meter (Wetlabs Eco-BB3, from June 2003). Additional instrumentation for measurement of inherent optical properties has been added from December 2011. The new package includes a hyperspectral absorption meter (Hobilabs a-sphere), a multispectral backscattering meter (Hobilabs Hydrosat-6) and a multispectral beam transmissometer (Hobilabs Gamma-4). The CDOM fluorometer, AC9 and Eco-BB3 have been withdrawn from the CTD package from March 2013. 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.

Operations that have to be performed in each cruise include:

- Collection and filtration of seawater samples for colored dissolved organic matter (from June 2005) and particulate organic carbon (from October 2011) analyses in the lab. Small quantities of seawater are to be fixed with glutaraldehyde for cytometric analysis (from December 2011).
- One CTD transect is performed between the BOUSSOLE site and the Port of Nice. This transect consists of six fixed stations on-route from BOUSSOLE (see map in appendix). Whenever feasible, this transect should be performed at a similar time for each cruise, in order to minimise the influence of possible diurnal variability.
- 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).

Further details about these operations and the 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 jellyfish cameras were tested during this cruise by Florent Besson from the *Laboratoire de Villefranche-sur-mer*.

The last day, a PCO₂ CARIOCA sensor was installed on the BOUSSOLE buoy at 3m depth. This operation is part of the BIOCAREX ANR project, in collaboration with the LOCEAN in Paris (J. Boutin and collaborators).

Cruise Summary

The first day bad weather prevented the work at the BOUSSOLE site. So, the two jellyfish cameras were tested at the Station 05 of the CTD transect and in front of the bay of Villefranche-sur-mer. The three next days, bad weather prevented from the Nice harbour.

The two last days were programmed for the MOOSE DYFAMED and ANTARES programs. These cruises were cancelled, so they were given to the BOUSSOLE program. One of this day was cancelled because of the bad weather. Only the last days was used for optical profiles, for CTD cast with water sampling, for the diving operations and for the CTD transect.

Thursday 12 July 2012

This day the sea state was moderate with a moderate breeze. The sky was blue. It was not possible to work at the BOUSSOLE site. Firstly, 2 jellyfish cameras were tested at 500 m depth at the Station 05 of the CTD transect. Then a CTD cast was performed at the Station 05 with the two cameras. After, the CTD was deployed at the Station 06 of the CTD transect but was then recovered immediately on board because there was too much waves and wind.

Friday 13 July 2012

Bad weather prevented departure from the Nice harbour.

Saturday 14 July 2012

Bad weather prevented departure from the Nice harbour.

Sunday 15 July 2012

Bad weather prevented departure from the Nice harbour.

Monday 16 July 2012

The last day, the sea state was moderate with a light breeze in the morning and slight with a gentle breeze. The sky was blue and the visibility was good. When arrived at the BOUSSOLE site, 4 C-OPS profiles and a Secchi disk were performed at the BOUSSOLE site. The CTD was deployed but the cast failed because of a problem with the power supply of the jellyfish cameras and because of the bad weather. After the lunch, the divers went at sea to clean the sensors and to perform the dark measurements of the transmissometers and backscattering meter. They also installed a PCO₂ CARIOCA sensor on the buoy at 3 m depth. The sensors on the top of the buoy were cleaned. Buoy data were downloaded directly using the cable available on top of the buoy. Then a CTD cast with water sampling was performed at the BOUSSOLE site and finally the CTD transect was performed partially. The CTD was deployed only at the stations 01, 02, 04 and 06 of the transect.

Cruise Report

Thursday 12 July 2012 (UTC)

People on board: Florent Besson, Emilie Diamond and Grigor Obolensky.

0730 Departure from the Nice harbour.
0850 Testing of 2 jellyfish cameras, 500 m next to Station 05
0935 Arrival at the Station 05 (43°37'N 07°25'E).
0950 CTD 01, 400 m, station 05: test of the jellyfish cameras.
1100 Lunch.
1210 Attempt of CTD, station 06 (43°39'N 07°21'E) : failed.
1240 CTD 02, 300m, station 06: test of the jellyfish cameras.
1315 Departure to the Nice harbour.
1330 Arrival at the Nice harbour.

Friday 13 July 2012

Bad weather prevented departure from the Nice harbour.

Saturday 14 July 2012

Bad weather prevented departure from the Nice harbour.

Sunday 15 July 2012

Bad weather prevented departure from the Nice harbour.

Monday 16 July 2012 (UTC)

People on board: Sophie Bellaiche, Florent Besson, Emilie Diamond, Yves Lamblard, Grigor Obolensky, Frédéric Quignaux et Emmanuel (diver).

0600 Departure from the Nice harbour.
0900 Arrival at the BOUSSOLE site.
0915 C-OPS 01, 02, 03, 04.
1030 Attempt of CTD 03: failed.
1045 Secchi 01, 22m.
1100 Lunch.
1200 Diving on the buoy for cleaning instruments, dark measurements and installing pCO₂ sensor at 3m.
1300 Direct connection with the buoy and data retrieval.
1400 CTD 03, 400 m, with water sampling at 400, 150, 80, 70, 60, 50, 40, 30, 20 and 10 m for HPLC, a_p, CDOM, POC and cytometry.
1440 Departure to the first transect station.
1520 CTD 04, 400 m, station 01 (43°25'N 07°48'E).
1630 CTD 05, 400 m, station 02 (43°28'N 07°42'E).
1800 CTD 06, 400 m, station 04 (43°34'N 07°31'E).
1920 CTD 07, 400 m, station 06 (43°39'N 07°21'E).
1945 Departure to the Nice harbour.
2015 Arrival at the Nice harbour.

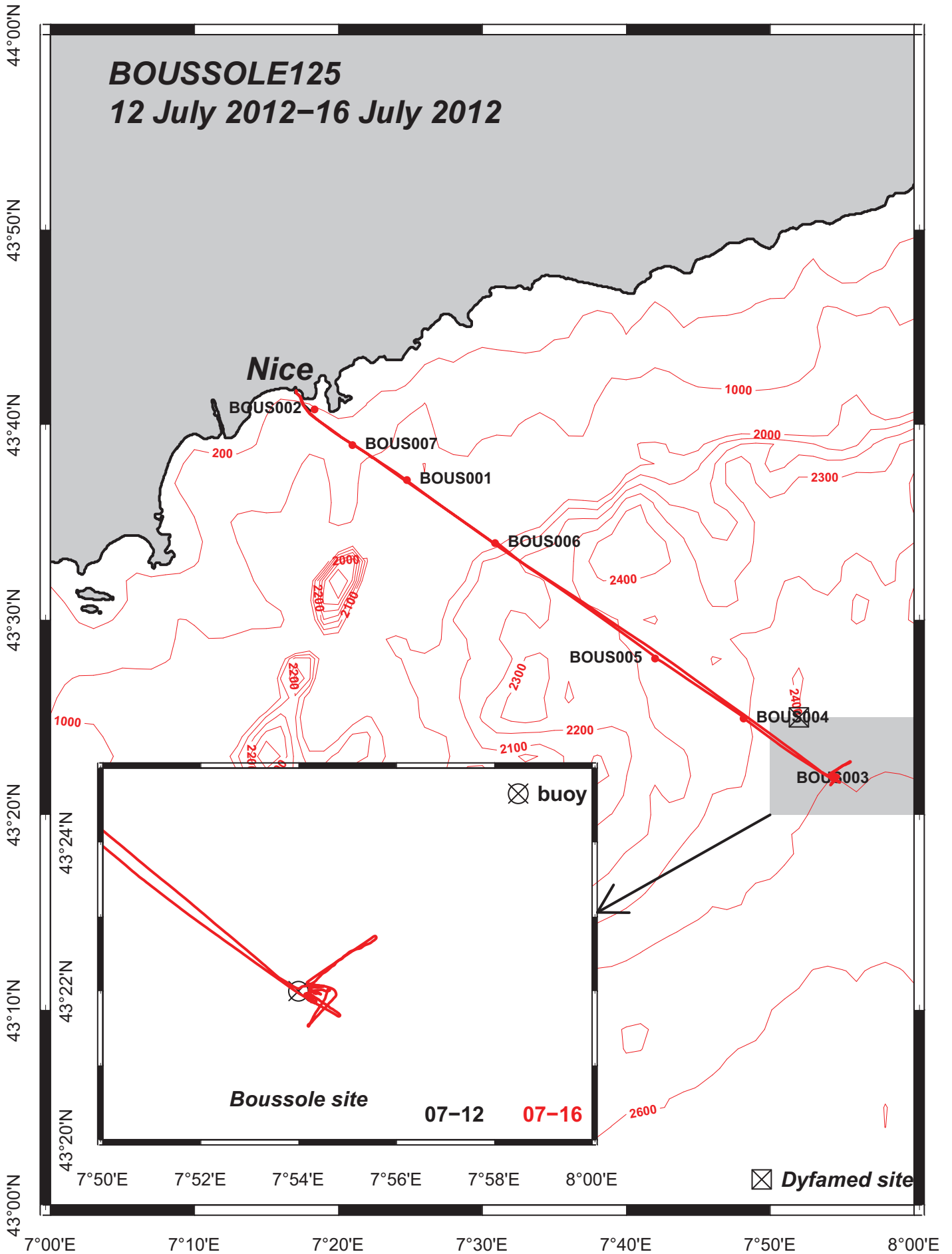
Problems identified during the cruise

- The first day during the CTD 02, the acquisition of CTD data stopped during the descent but it was decided to continue the descent at 300 m in order to test the jellyfish cameras.
- The last day, a CTD cast was attempted in the morning but it was stopped because there was a problem of electrical supply and too much waves.

Appendices

Cruise Summary Table for Boussole 125

Date	Black names	Profile names	CTD names	Other sensors	Start Time		Depth max (meter)	Latitude (N)			Longitude (E)			Sky	Clouds	Quantity (#/8)	Weather		Atm. Pressure (hPa)	Humidity (%)	Visibility	T air	T water	Sea		Whitecaps	
					GMT (hour.min)	(min.sec)		(Degree)	(Minute)	(Degree)	(Minute)	Wind sp. (kn)	Wind dir.				Sea	Swell H (m)						Swell dir.			
12/07/12			CTDBOUS001		09:51	25:00	400	43	37.167	7	24.769	blue			1	7	74	1012.4	63		24.7	24.6	moved		few		
			CTDBOUS002		12:14	2:00	20	43	40.788	7	18.351	blue			1	15	53	1012	67		25.8	26.1	moved		yes		
13/07/12																											
14/07/12																											
15/07/12																											
16/07/12	bou_c-ops_120716_0902_001_data.csv				09:05	1:13																					
	bou_c-ops_120716_0902_002_data.csv				09:17	1:59	41	43	22.331	7	54.686	blue	none	0	4	338	1021.3	82	good	21.5			moved	1.4	no		
	bou_c-ops_120716_0902_003_data.csv				09:25	3:49	85.9	43	22.422	7	54.860	blue	none	0	4	338	1021.3	82	good	21.5			moved	1.4	no		
	bou_c-ops_120716_0902_004_data.csv				09:35	3:38	86.8	43	22.535	7	55.076	blue	none	0	4	338	1021.3	82	good	21.5			moved	1.4	no		
	bou_c-ops_120716_0902_005_data.csv				09:46	3:10	74.2	43	22.614	7	55.534	blue	none	0	4	338	1021.3	82	good	21.5			moved	1.4	no		
	bou_c-ops_120716_0902_005_data.csv				10:49	1:21																					
					Secchi01	11:00	4:00	22	43	22	7	54	blue														
				CTDBOUS003	HPLC, Ap, CDOM, POC & cyto	14:00	34:00	400	43	21.911	7	54.359	blue			3	9	263	1021	75		23.5	20.9	calm			
				CTDBOUS004		15:22	25:00	400	43	24.942	7	48.158	blue			2	6	262	1021	72		23.2	22.1	calm			
				CTDBOUS005		16:32	25:00	400	43	28.018	7	42.007	blue			2	6	132	1021	74		23.0	22.1	calm			
			CTDBOUS006		18:00	23:00	400	43	33.936	7	30.892	blue			1	10	107	1021	65		23.1	22.8	calm				
			CTDBOUS007		19:19	24:00	400	43	38.960	7	20.983	night			8	7	89	1021	62		23.6	23.4	calm				

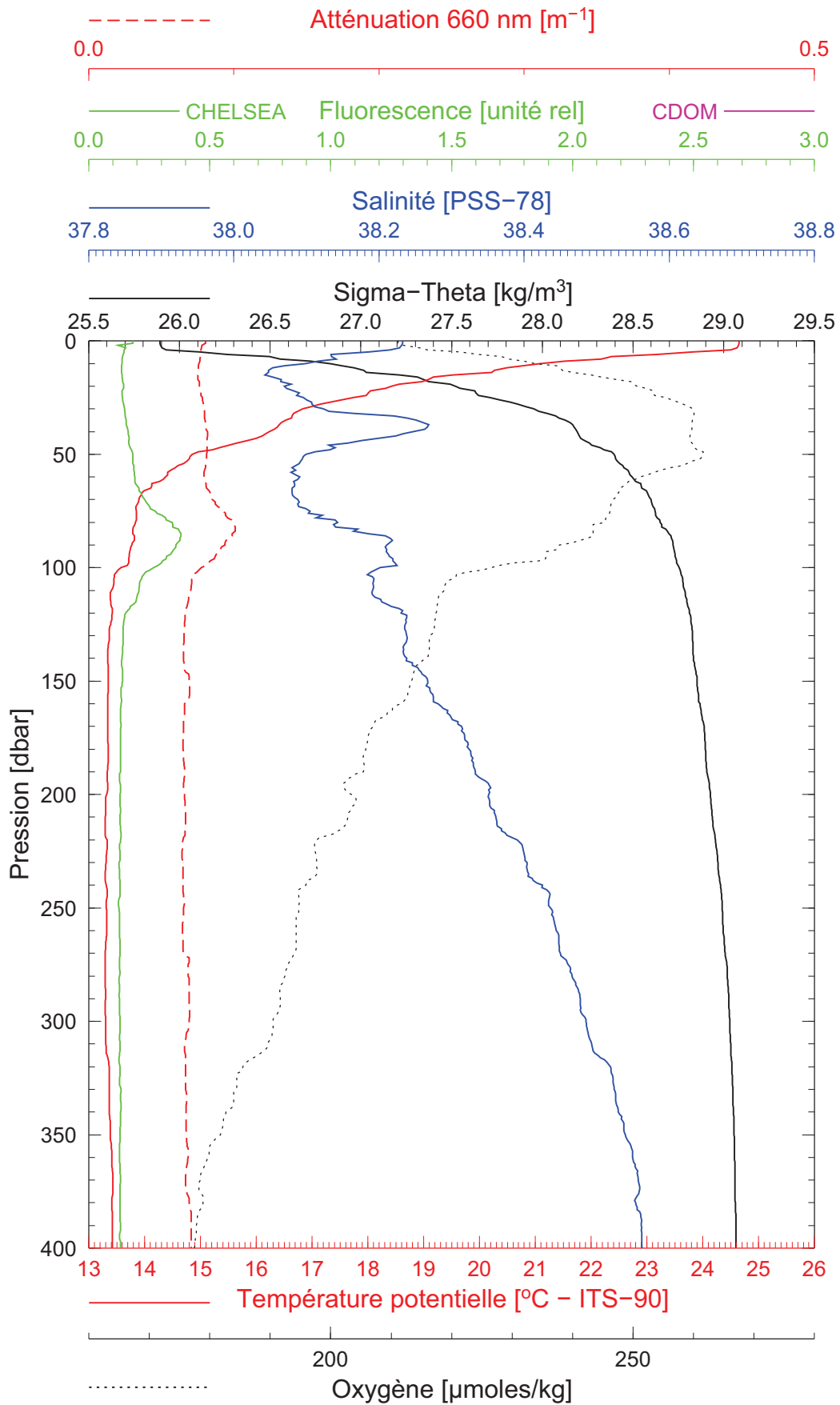


BOUSSOLE 125

12/07/2012

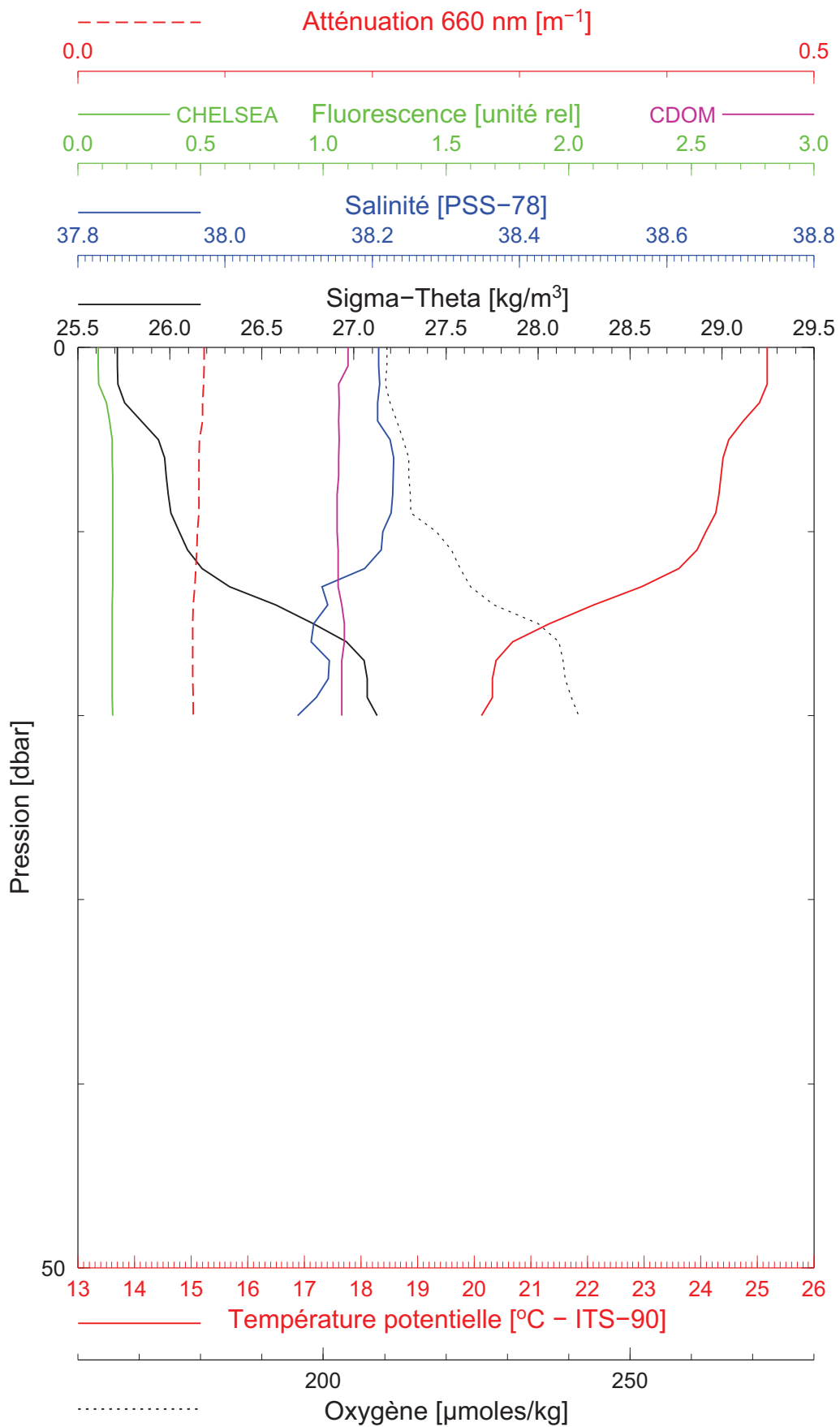
BOUS120712_01

BOUS001



Date 12/07/2012
Heure déb 09h 51min [TU]

Latitude 43°37.167 N
Longitude 07°24.769 E



Date 12/07/2012
Heure déb 12h 14min [TU]

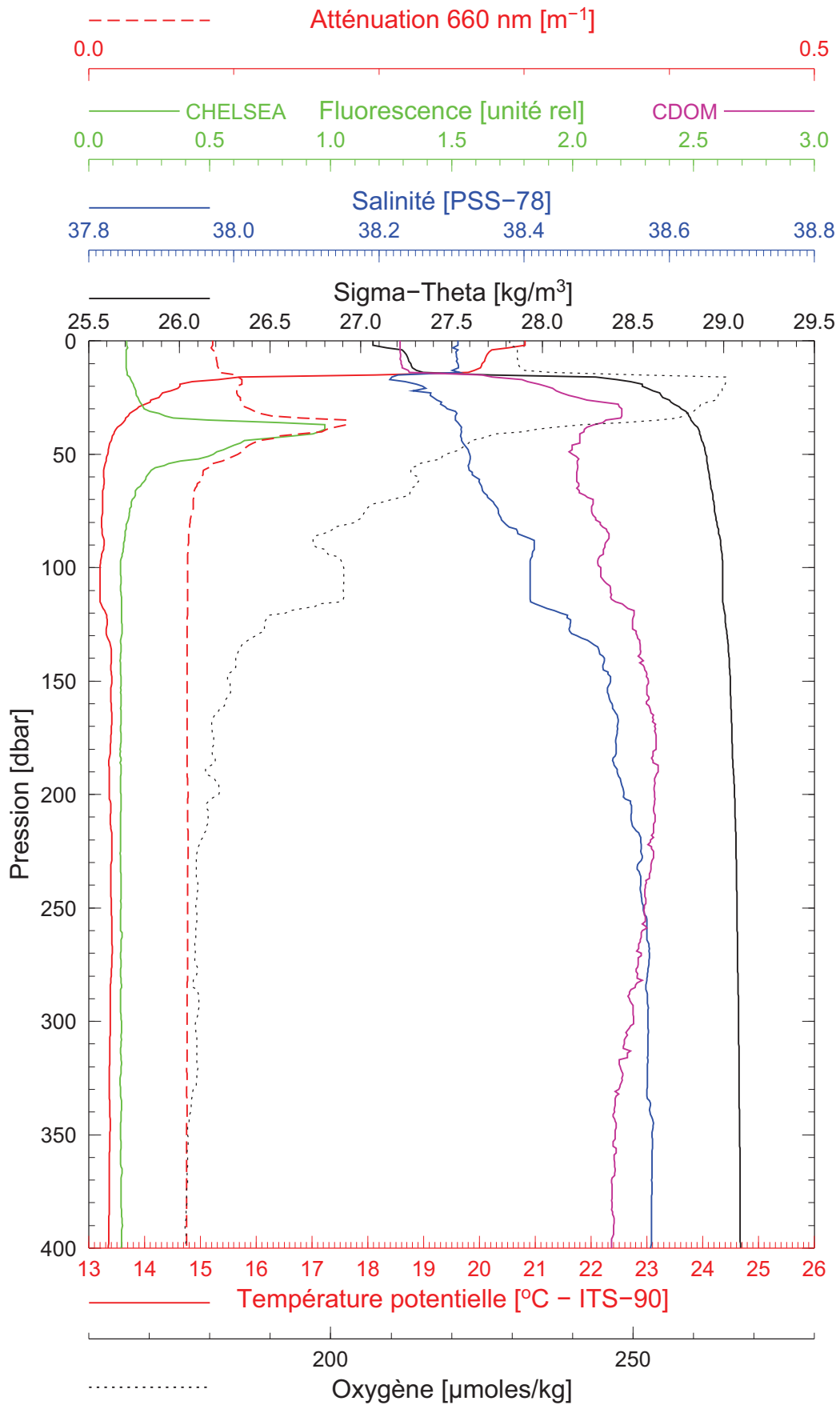
Latitude 43°40.788 N
Longitude 07°18.351 E

BOUSSOLE 125

16/07/2012

BOUS120716_01

BOUS003



Date 16/07/2012
Heure déb 14h 00min [TU]

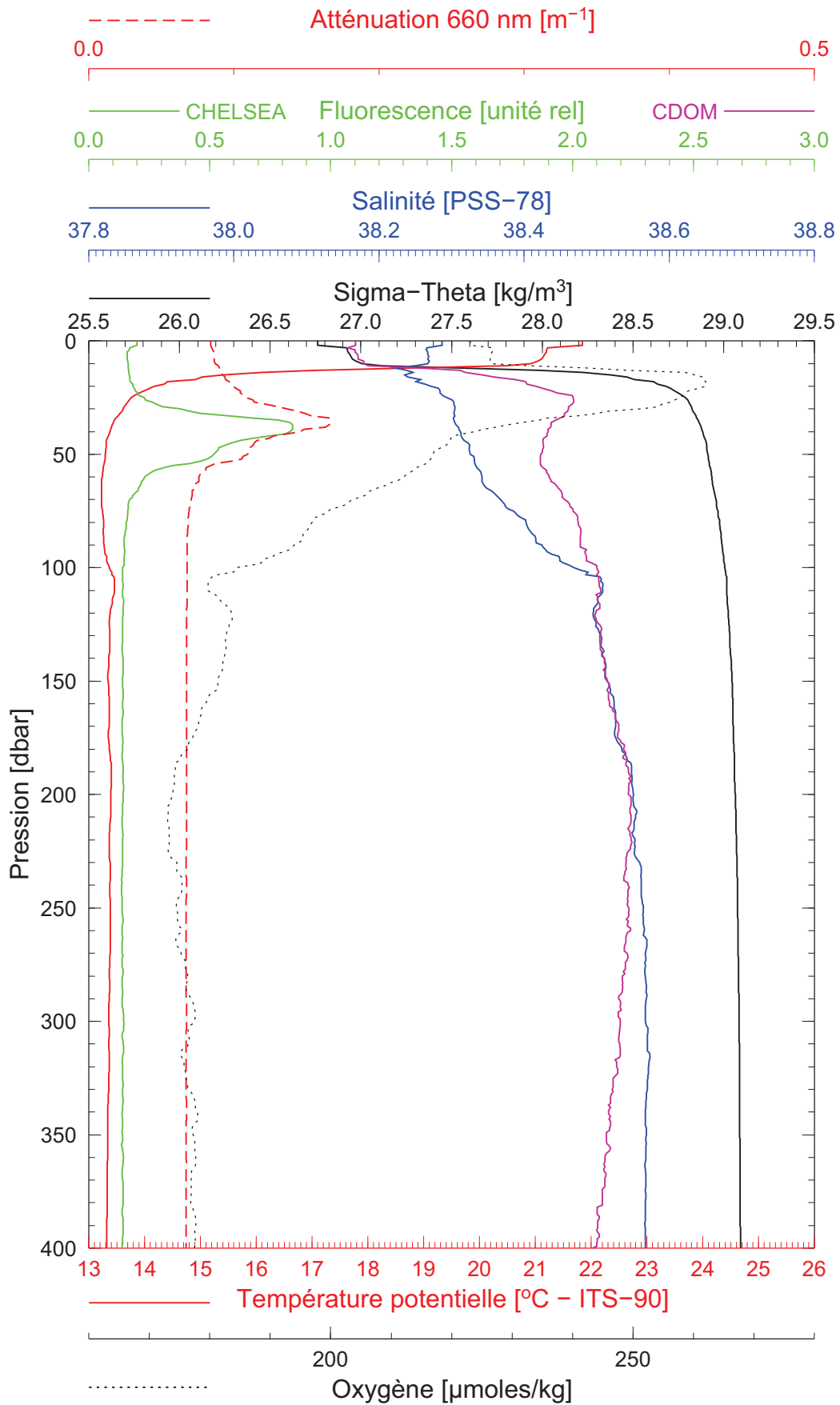
Latitude 43°21.911 N
Longitude 07°54.359 E

BOUSSOLE 125

16/07/2012

BOUS120716_02

BOUS004



Date 16/07/2012
Heure déb 15h 22min [TU]

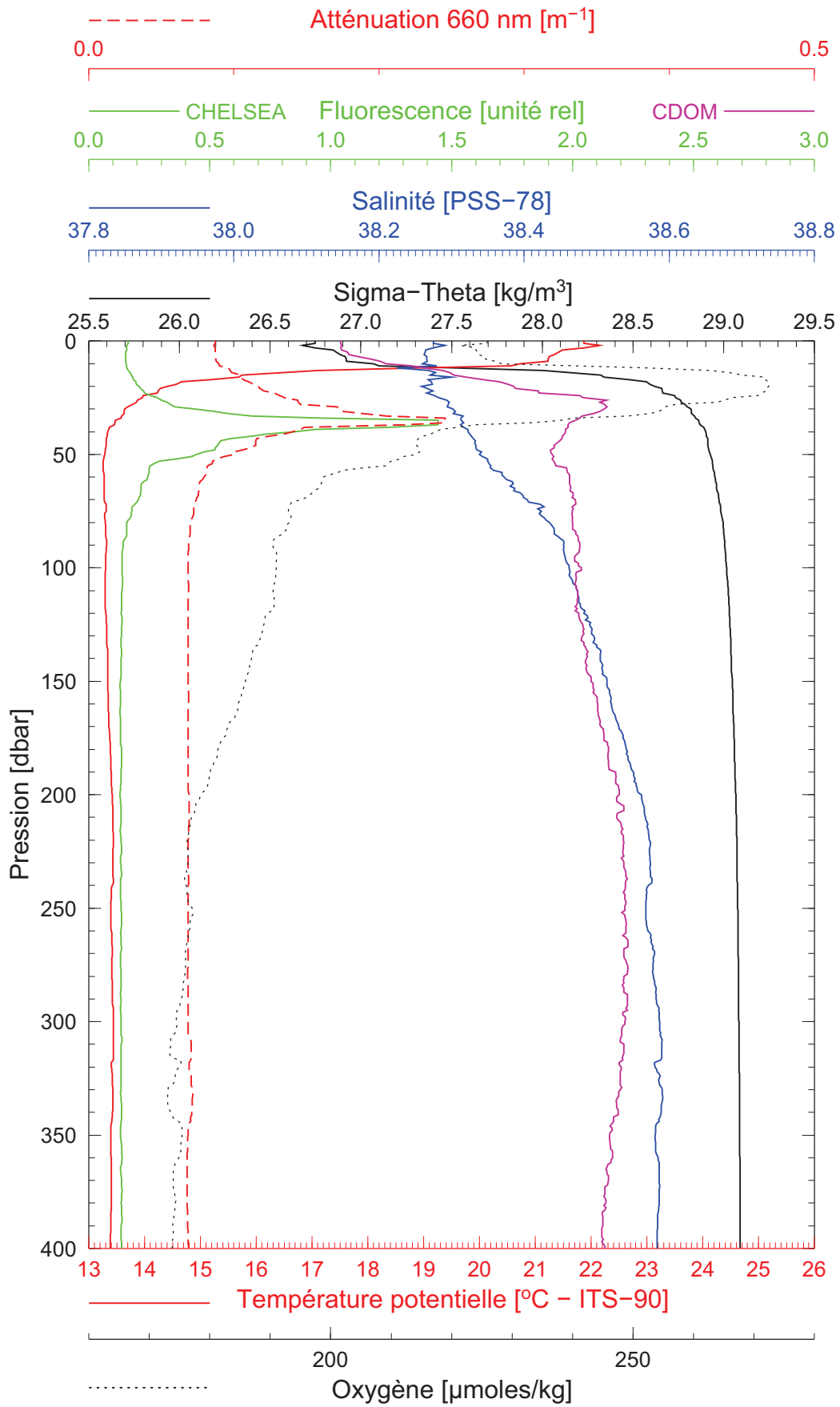
Latitude 43°24.942 N
Longitude 07°48.158 E

BOUSSOLE 125

16/07/2012

BOUS120716_03

BOUS005



Date 16/07/2012
Heure déb 16h 32min [TU]

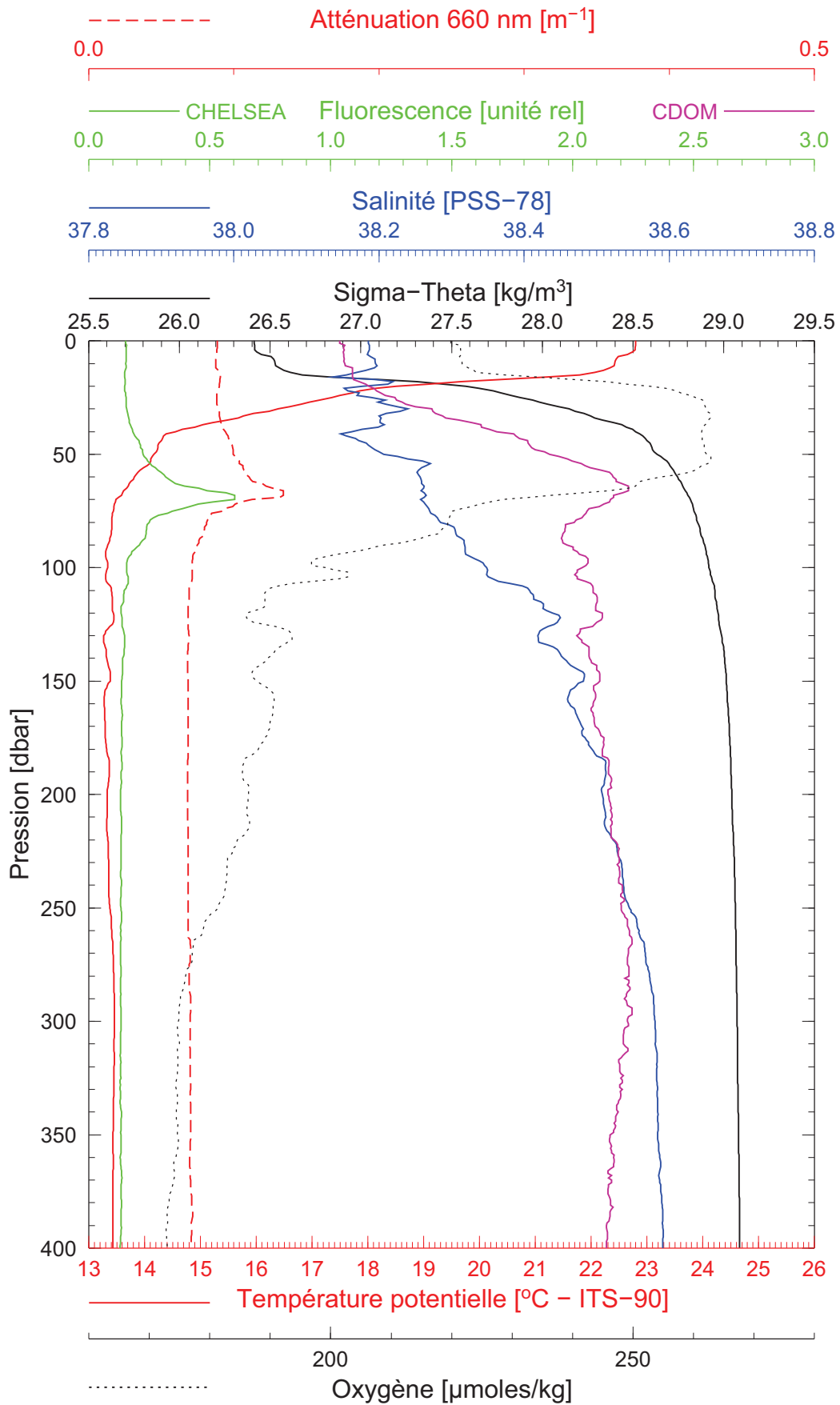
Latitude 43°28.018 N
Longitude 07°42.007 E

BOUSSOLE 125

16/07/2012

BOUS120716_04

BOUS006



Date 16/07/2012
Heure déb 18h 00min [TU]

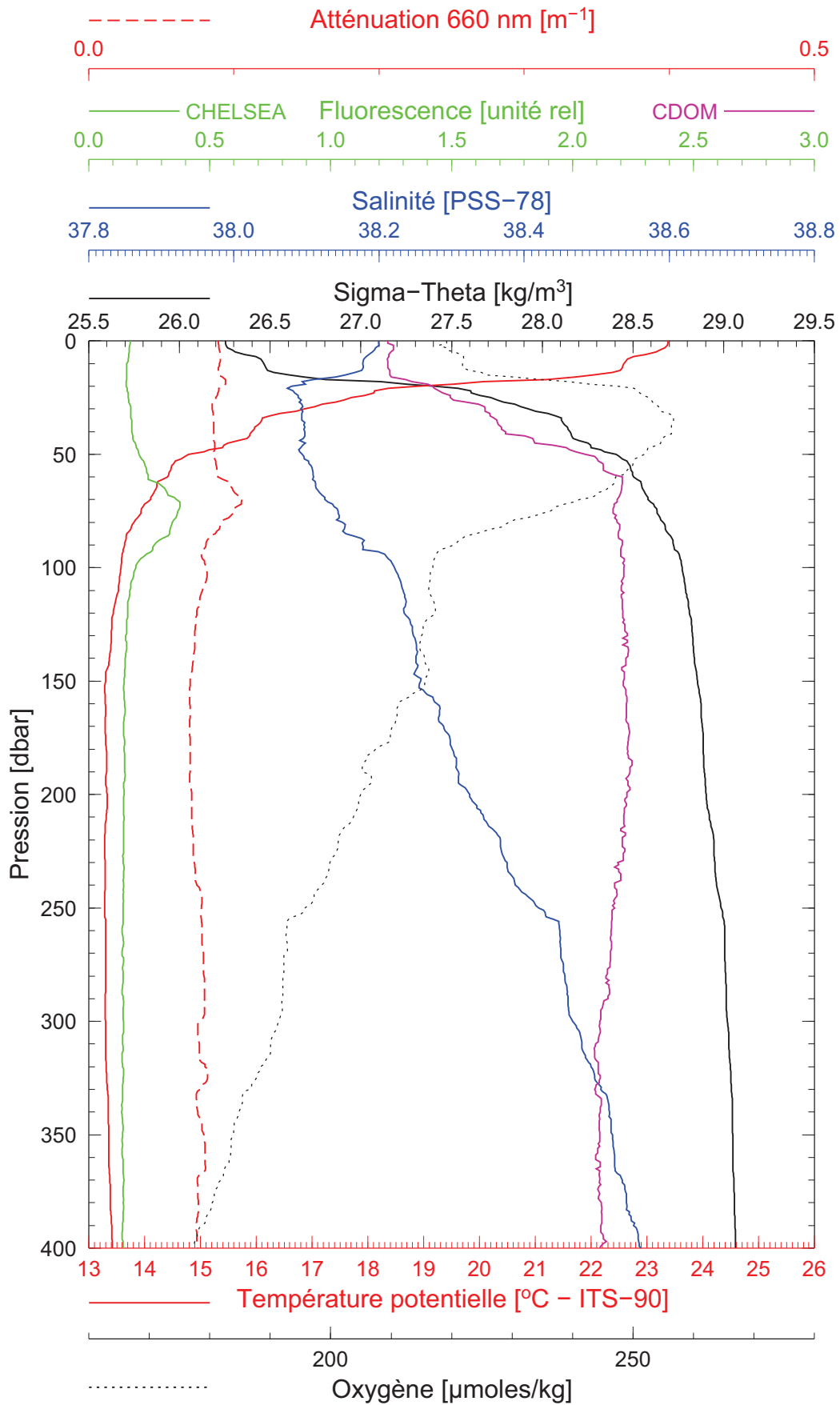
Latitude 43°33.936 N
Longitude 07°30.892 E

BOUSSOLE 125

16/07/2012

BOUS120716_05

BOUS007



Date 16/07/2012
Heure déb 19h 19min [TU]

Latitude 43°38.960 N
Longitude 07°20.983 E