

# BOUSSOLE Monthly Cruise Report

**Cruise 157**

**March 05– 09, 2015**

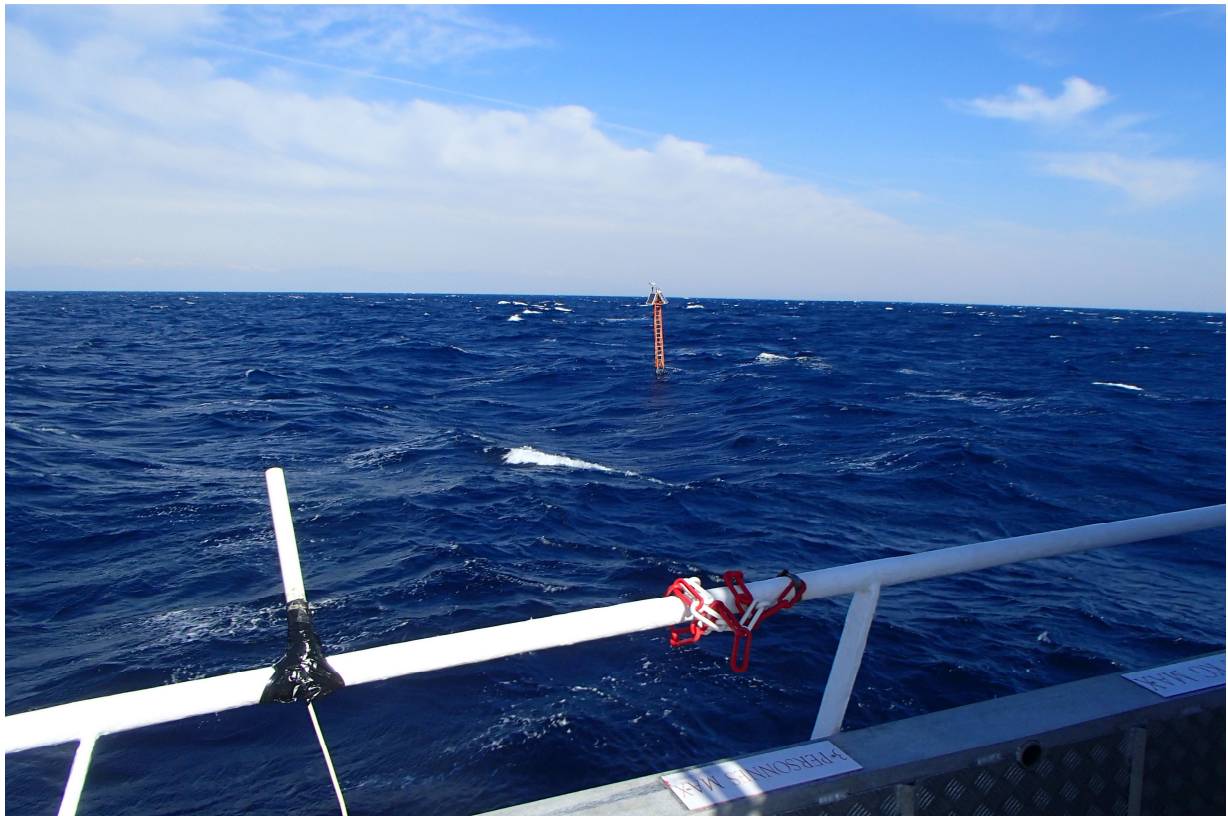
Duty Chief: Melek Golbol ([golbol@obs-vlfr.fr](mailto:golbol@obs-vlfr.fr))

Vessel: R/V *Téthys II*

(Captain: Davy Deneuve)

Science Personnel: Chabha Berrached, Laurent Coppola, Guillaume De Liège, Melek Golbol, David Luquet, Didier Robin, Vincent Taillandier.

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



Attempt of connection (via the CISCO antenna) with the BOUSSOLE buoy for data retrieval.

**BOUSSOLE project**

**ESA/ESRIN contract N° 4000111801/14/I-NB**

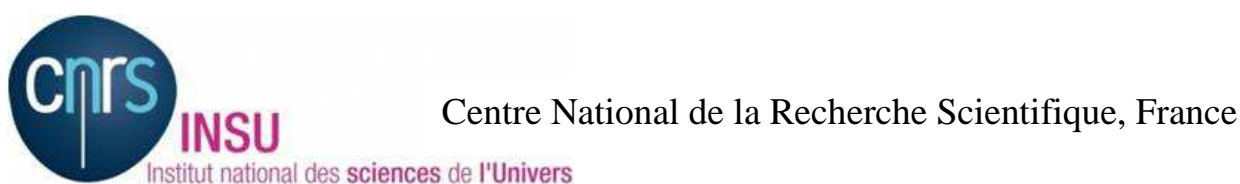
*March 19, 2015*



## 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



## Contents

1. Cruise Objectives
2. Cruise Summary
3. Cruise Report
4. Problems identified during the cruise

## Appendices

## 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 Hydroscat-6) and a multispectral beam transmissometer (Hobilabs Gamma-4). 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).
- 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).

In addition, water samples are to be collected at two depths (5m and 10m) 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 pCO<sub>2</sub> 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](http://www.obs-vlfr.fr/Boussole/html/publications/pubs/BOUSSOLE_TM_214147.pdf)

### Additional operations

One additional day (March 9<sup>th</sup>) was used for BOUSSOLE operations. This day was initially programmed for the DYFAMED program, but was jointly used for BOUSSOLE operations and for a deep CTD cast at the station#01 for the DYFAMED program.

## Cruise Summary

The two first days and the fourth day were cancelled because bad weather prevented departure from the Nice harbour. The second day, a connection to the buoy was attempted from the boat via the CISCO antenna but failed. Because of bad weather, we could not perform the CTD casts and the optical profiles. A sample was collected at the surface and a Secchi disk was performed at the BOUSSOLE site.

The last day was used to perform the CTD transect from the Nice harbour to the BOUSSOLE site, a CTD cast with water sampling, optical profiles, diving operations at the BOUSSOLE site and to retrieve data from the buoy.

## Thursday 05 March 2015

Bad weather prevented departure from the Nice harbour.

## Friday 06 March 2015

Bad weather prevented departure from the Nice harbour.

## Saturday 07 March 2015

The sea state was moderate with a fresh breeze. Bad weather prevented us to perform the CTD casts and the optical profiles. A sample was collected with a bucket at the sea surface for HPLC,  $a_p$  and TSM analyses. Then, a Secchi disk was performed at the BOUSSOLE site.

## Sunday 08 March 2015

Bad weather prevented departure from the Nice harbour.

## Monday 09 March 2015

The sea state was slight with a moderate breeze. The sky was cloudy with a good visibility. The weather forecasts were bad at the BOUSSOLE site on the morning and better on the afternoon. So it was decided to start the operations with the CTD transect from the Nice harbour to the BOUSSOLE site. A deep CTD cast was performed at the station#01 of the CTD transect for the DYFAMED program. When arrived at BOUSSOLE, 1 CTD cast with water sampling and 2 C-OPS profiles were performed. Then divers went at sea to clean the buoy sensors. Buoy data were retrieved from a physical connection to the buoy computer via the cable available on top of the buoy and via the AK DACNet connector. The ARGOS and CISCO connectors and solar panels on the top of the buoy were cleaned.

Pictures taken during this cruise can be found at:

<https://plus.google.com/photos/114686870380724925974/albums/6127899305708852481?banner=pwa>

Data from the BOUSSOLE cruises and buoy are available at:

[http://www.obs-vlfr.fr/Boussole/html/boussole\\_data/login\\_form.php](http://www.obs-vlfr.fr/Boussole/html/boussole_data/login_form.php)

## Cruise Report

### Thursday 05 March 2015

Bad weather prevented departure from the Nice harbour.

### Friday 06 March 2015

Bad weather prevented departure from the Nice harbour.

### Saturday 07 March 2015 (UTC)

People on board: Chabha Berrached, Laurent Coppola, Melek Golbol and Vincent Taillandier.

0620 Departure from the Nice harbour.  
0930 Arrival at the BOUSSOLE site.  
1000 Attempts of CISCO connection with the buoy: failed.  
1020 Water sampling on surface with bucket for HPLC,  $a_p$  and TSM.  
1030 Secchi 01, 13m.  
1035 Departure to the Nice harbour.  
1330 Arrival at the Nice harbour.

## Sunday 08 March 2015

Bad weather prevented departure from the Nice harbour.

## Monday 09 March 2015 (UTC)

People on board: Guillaume De Liège, Melek Golbol, David Luquet, Didier Robin and Vincent Taillandier.

0610 Departure from the Nice harbour.  
0640 Arrival at the sixth transect station.  
0645 CTD 01, 400 m, station 06 (43°39'N 07°21'E).  
0730 CTD 02, 400 m, station 05 (43°37'N 07°25'E).  
0830 CTD 03, 400m, station 04 (43°34'N 07°31'E).  
0930 CTD 04, 400m, station 03 (43°31'N 07°37'E).  
1020 CTD 05, 400m, station 02 (43°28'N 07°42'E).  
1120 CTD 06, 2380m, station 01 (43°25'N 07°48'E).  
1240 Departure to the BOUSSOLE site.  
1315 Arrival at the BOUSSOLE site.  
1325 CTD 01, 400m with water sampling at 400, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC,  $a_p$ , TSM and CDOM.  
1405 C-OPS 01, 02.  
1445 Diving on the BOUSSOLE buoy for cleaning sensors.  
1510 Cleaning of the sensors and solar panels on the top of the buoy.  
1525 Direct connection with the buoy (AK DACNet connector) and data retrieval.  
1600 Departure to the Nice harbour.  
1900 Arrival at the Nice harbour.

## Problems identified during the cruise

- The IOP package was not available because the instruments were sent to *Hobi Instruments service* for calibrations. The instruments were not returned in time for this cruise.
- CTD #02: Niskin bottle #2 did not close, so there was no sampling at 200m.
- The last day, the bad weather forecasts forced us to start late the work at the BOUSSOLE site when the weather forecasts were better on the afternoon. The following operations could not be performed: dark measurements of the backscattering meter and transmissometers and sampling for TA/TC and DO.
- The optical profiles were performed only the last day because of the bad weather during this cruise but the sky conditions during these profiles were not optimal (many clouds and unstable sky).

## **Appendices**

Cruise Summary Table for Boussole 157

Date	Black names (file ext: ".raw")	Profile names (file extension: ".raw")	CTD notées	Other sensors	Start Time GMT (hour.min)	Duration (min.sec)	Depth max (meter)	Latitude (N)		Longitude		Sky	Clouds	Quantity (#/8)	Weather Wind sp. (kn)	Wind dir.	Atm. Pressure (hPa)	Humidity (%)	Visibility	T air	T water	Sea	Sea Swell H (m)	Swell dir.	Whitecaps
05/03/15																									
06/03/15																									
07/03/15				HPLC, Ap, TSM (bucket)	10:20	3:00	surface	43	22	7	54	cloudy		4	20				good			moved	2		
				Secchi01	10:30	4:00	13	43	22	7	54	cloudy		4	20				good			calm	2		
08/03/15																									
09/03/15			CTDBOUS001	HPLC, Ap, TSM & CDOM	06:45	16:00	400	43	39.018	7	21.056	blue		0	3	278	1024.4	62		12.3	13.58	calm			
			CTDBOUS002		07:29	15:00	400	43	37.081	7	24.966	blue		0	2	190	1024.7	50		13.3	13.80	calm			
			CTDBOUS003		08:27	15:00	400	43	34.037	7	30.744	blue		2	3	38	1024.9	51		12.6	13.84	calm			
			CTDBOUS004		08:25	16:00	400	43	31.021	7	36.773	blue		3	13	100	1024.7	45		13.7	13.82	calm			
			CTDBOUS005		10:19	18:00	400	43	28.012	7	41.884	blue		3	12	75	1023.7	56		12.5	13.84	calm			
			CTDBOUS006		11:19	38:00	2380	43	25.169	7	48.092	blue		2	17	83	1023.8	47		12.8	13.48	moved			
			CTDBOUS007		13:26	26:00	400	43	22.148	7	53.896	blue		2	13	91	1023.3	51		12.9	13.52	calm			
			bou_c-ops_150309_1252_001_data.csv		14:04	2:52	72.1	43	22.231	7	53.801	cloudy	Cs	6	8	119	1023.3	48	good	12.8		calm	0.8	no	
			bou_c-ops_150309_1252_002_data.csv		14:20	4:04	100.5	43	22.420	7	53.275	cloudy	Cs	6	8	119	1023.3	48	good	12.8		calm	0.8	no	

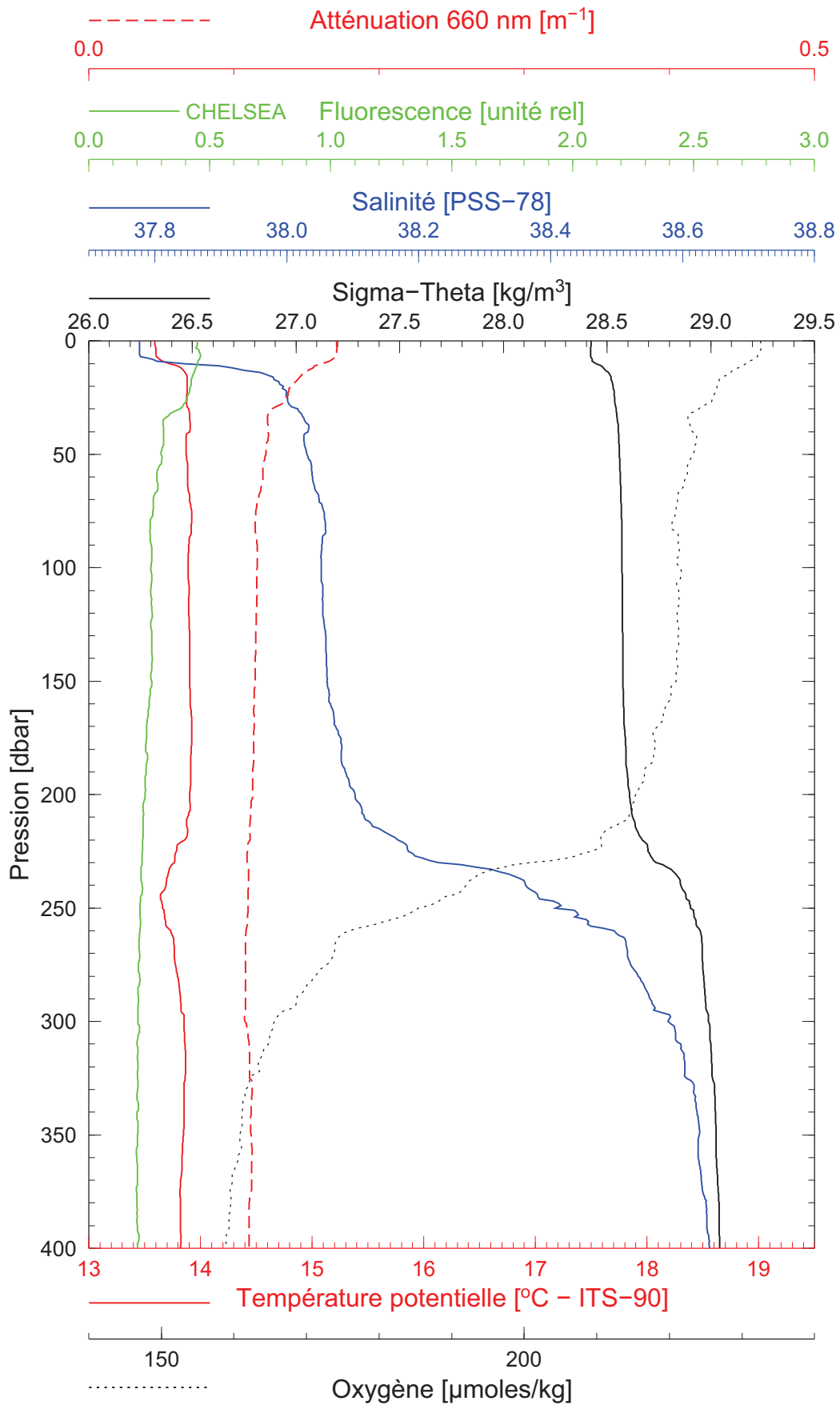


BOUSSOLE 157

09/03/2015

BOUS150309\_01

BOUS001



Date 09/03/2015  
Heure déb 06h 45min [TU]

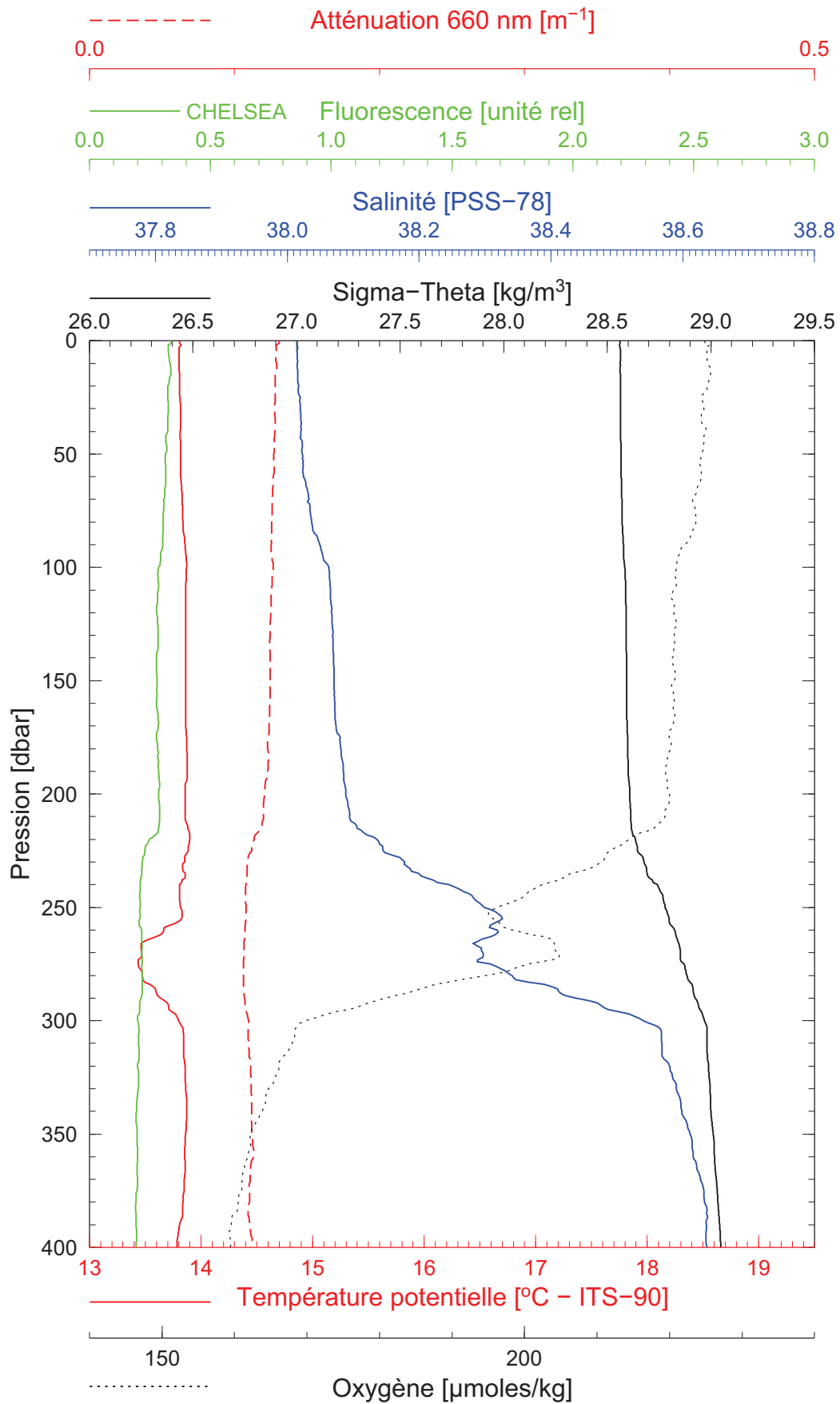
Latitude 43°39.018 N  
Longitude 07°21.056 E

BOUSSOLE 157

09/03/2015

BOUS150309\_02

BOUS002



Date 09/03/2015

Latitude 43°37.081 N

Heure déb 07h 29min [TU]

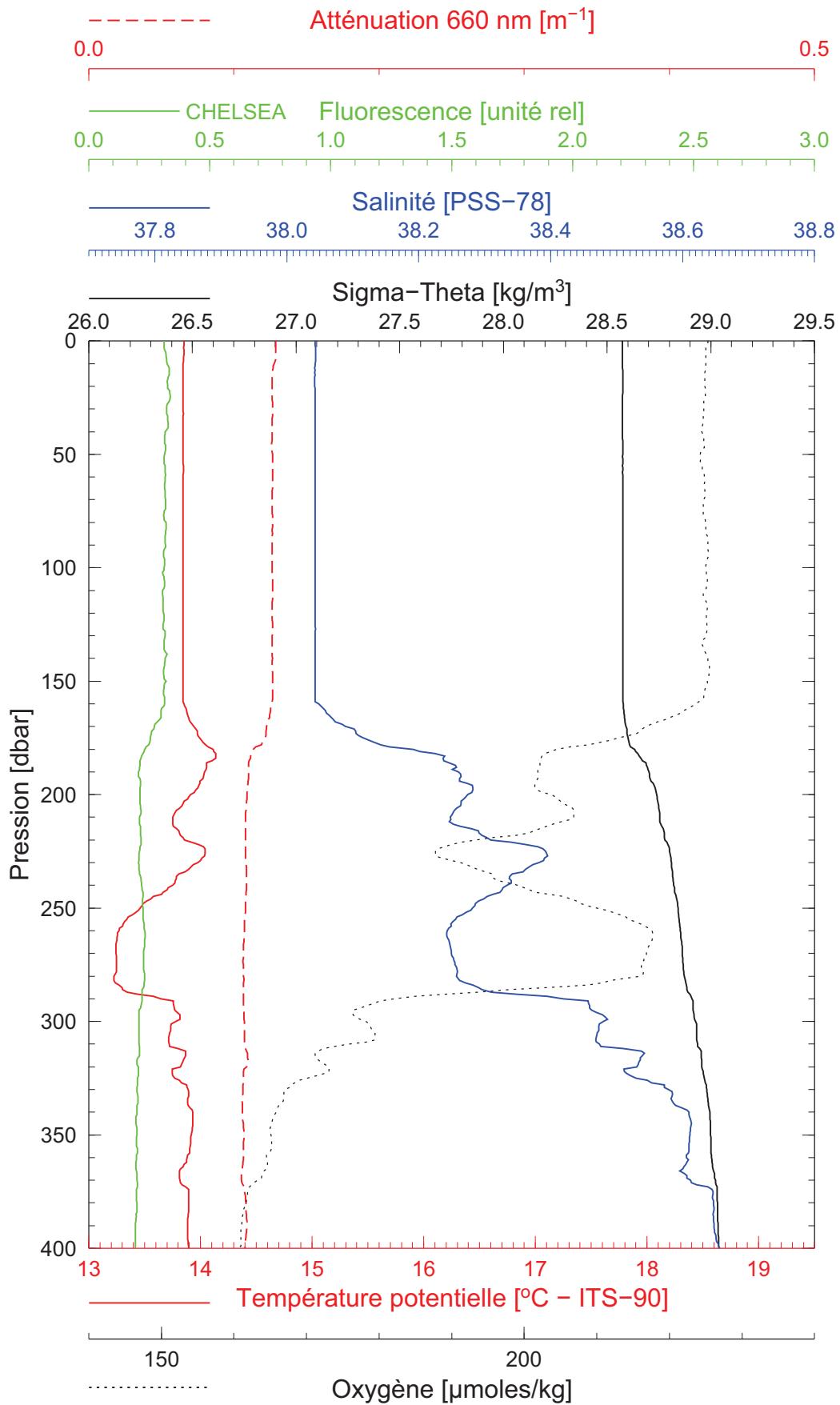
Longitude 07°24.966 E

BOUSSOLE 157

09/03/2015

BOUS150309\_03

BOUS003



Date 09/03/2015

Latitude 43°34.037 N

Heure déb 08h 27min [TU]

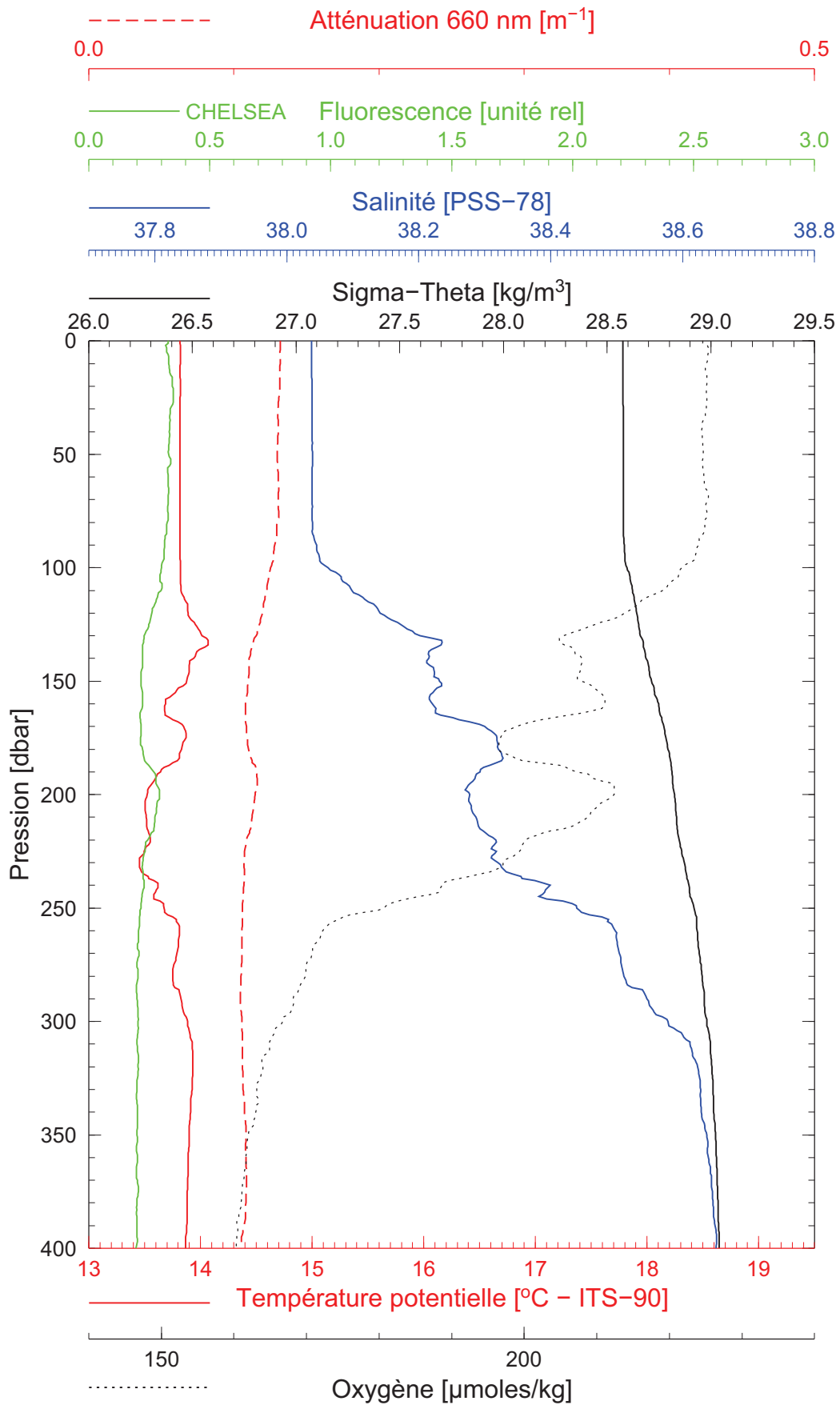
Longitude 07°30.744 E

BOUSSOLE 157

09/03/2015

BOUS150309\_04

BOUS004



Date 09/03/2015

Latitude 43°31.021 N

Heure déb 09h 25min [TU]

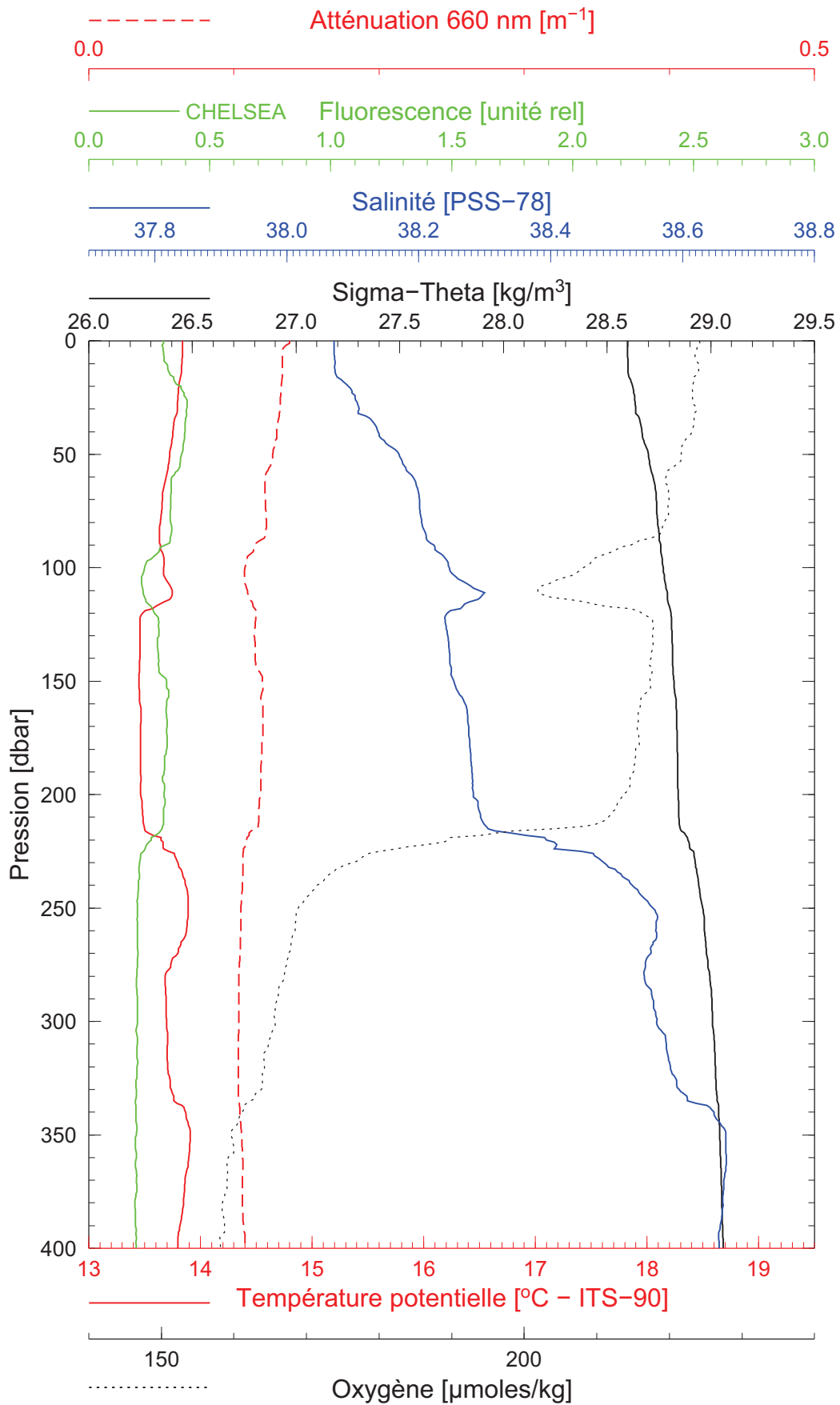
Longitude 07°36.773 E

BOUSSOLE 157

09/03/2015

BOUS150309\_05

BOUS005



Date 09/03/2015  
Heure déb 10h 19min [TU]

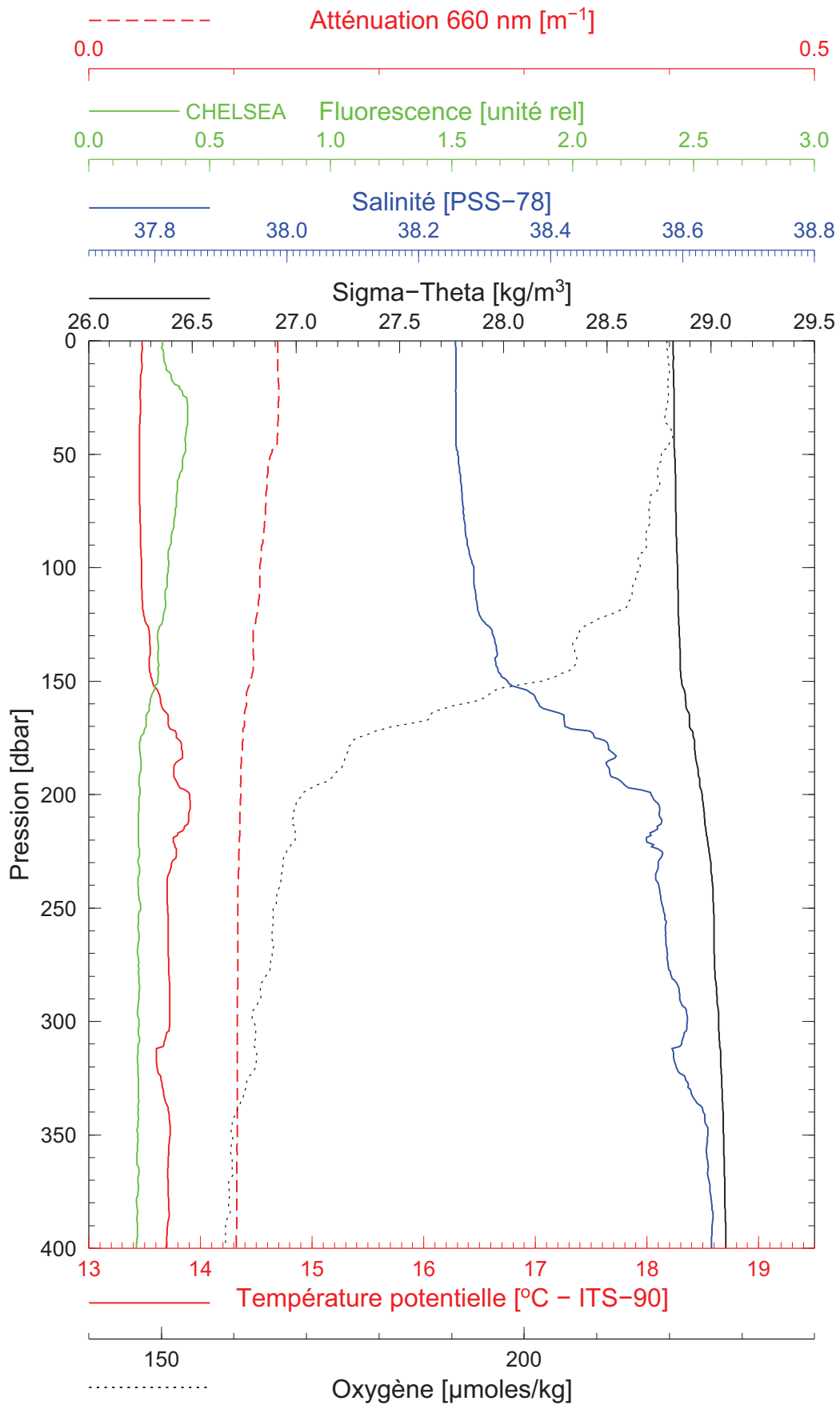
Latitude 43°28.012 N  
Longitude 07°41.884 E

BOUSSOLE 157

09/03/2015

BOUS150309\_06

BOUS006



Date 09/03/2015  
Heure déb 11h 19min [TU]

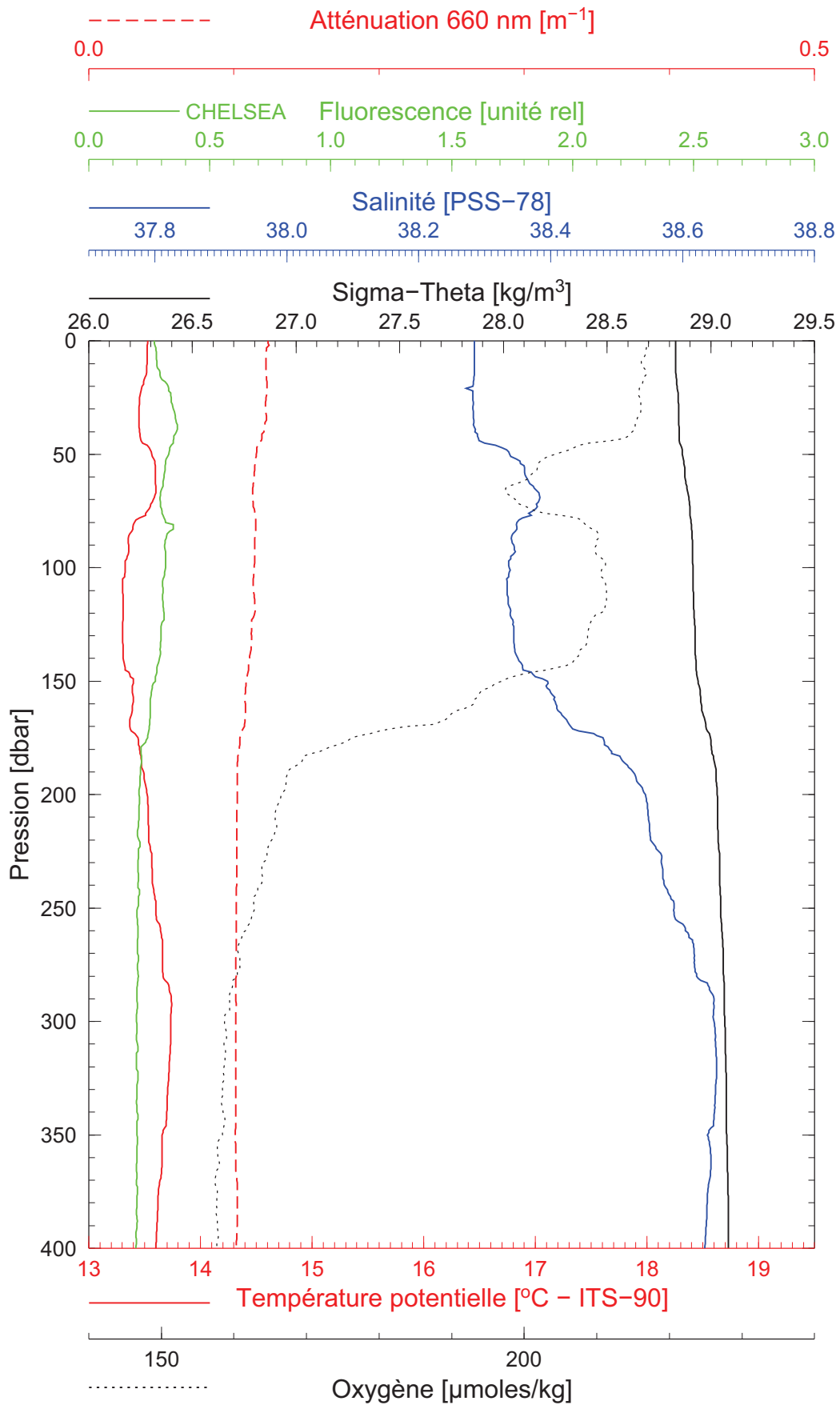
Latitude 43°25.169 N  
Longitude 07°48.092 E

BOUSSOLE 157

09/03/2015

BOUS150309\_07

BOUS007



Date 09/03/2015  
Heure déb 13h 26min [TU]

Latitude 43°22.148 N  
Longitude 07°53.896 E