

BOUSSOLE Monthly Cruise Report

Cruise 156

February 09-12, 2015

Duty Chiefs: Vincent Taillandier & Vincenzo Vellucci

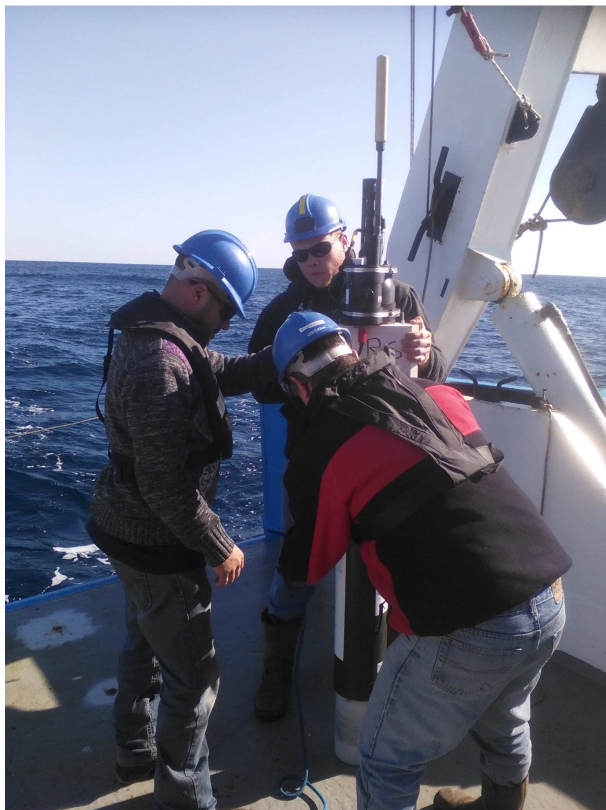
Report written by Melek Golbol (golbol@obs-vlfr.fr)

Vessel: R/V *Téthys II*

(Captain: Joël Perrot)

Science Personnel: Alain Cariou, Guillaume De Liège, Yves Lamblard, Raymond Le Guen, Edouard Leymarie, Didier Robin, Vincent Taillandier and Vincenzo Vellucci.

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



Preparation of the Pro-Ice profiling float before its deployment at the BOUSSOLE site

BOUSSOLE project

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

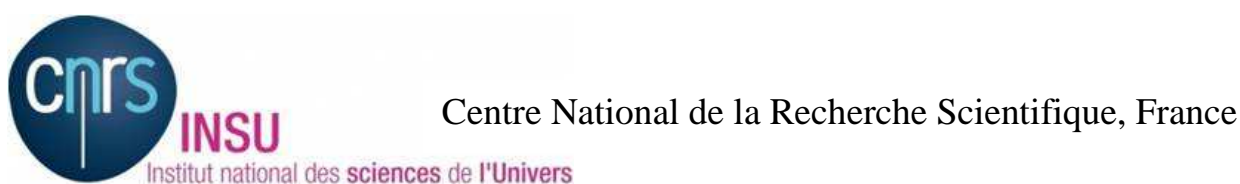
March 02, 2015



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



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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 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. 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 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

A Pro-Ice profiling float was deployed at the BOUSSOLE site during this cruise for testing by the Marine Optics and Remote Sensing Lab - Laboratoire d'Océanographie de Villefranche.

Two technicians from METEO-FRANCE were on board for a maintenance operation on the METEO-FRANCE buoy. They replaced one of the two anemometers of the buoy.

Cruise Summary

The first day was used to deploy the profiling float and to perform a CTD cast with water sampling. The second day was used to perform a CTD cast with water sampling and the CTD transect. The third day was used for diving operations, retrieving data from the buoy, optical profiles, a CTD cast with water sampling and a Secchi disk. This day was also used for the maintenance operation on the METEO-FRANCE buoy. The last day was used for optical profiles and a CTD cast with water sampling.

Monday 09 February 2015

The sea state was slight with a moderate breeze. The sky was blue. The Pro-Ice profiling float was deployed next to the BOUSSOLE site. Then 1 CTD cast with water sampling was performed at the BOUSSOLE site.

Tuesday 10 February 2015

The sea state was slight with a light breeze. The sky was blue. 1 CTD cast with water sampling at the BOUSSOLE site and the CTD transect were performed.

Wednesday 11 February 2015

The sea state was smooth with a light breeze. The sky was blue and the visibility was excellent. When arrived at BOUSSOLE site, divers went at sea to clean the buoy sensors and perform dark measurements of the backscattering meter and transmissometers. 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. Then, 3 C-OPS profiles and 1 CTD cast with water sampling were performed at the BOUSSOLE site. After finishing the operations at the BOUSSOLE site, we went at the METEO-FRANCE buoy site. The anemometer was replaced on the METEO-FRANCE buoy. A Secchi disk was performed on this site.

Thursday 12 February 2015

The sea state was smooth with a gentle breeze. The sky was overcast on the morning and blue on the afternoon. The visibility was good. 1 CTD cast with water sampling and 3 C-OPS profiles were performed at the BOUSSOLE site.

Pictures taken during this cruise can be found at:

<https://plus.google.com/photos/114686870380724925974/albums/6122007506942780065?banner=pwa>

Data from the BOUSSOLE cruises and buoy are available at:

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

Cruise Report

Monday 09 February 2015 (UTC)

People on board: Edouard Leymarie and Vincent Taillandier.

0900 Departure from the Nice harbour.
1210 Arrival at the BOUSSOLE site.
1225 Deployment of the Pro-Ice profiling float.
1235 CTD 01, 400m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC and a_p .
1320 Departure to the Nice harbour.
1630 Arrival at the Nice harbour.

Tuesday 10 February 2015 (UTC)

People on board: Vincent Taillandier

0700 Departure from the Nice harbour.
1015 Arrival at the BOUSSOLE site.
1030 CTD 02, 400m with water sampling at 200, 150, 80, 70, 60, 50, 30, 20, 10 and 5 m for HPLC and a_p .
1100 Filtrations.
1200 Departure to the first transect station.
1245 CTD 03, 400m, station 01 (43°25'N 07°48'E).
1330 CTD 04, 400m, station 02 (43°28'N 07°42'E).

1415 CTD 05, 400m, station 03 (43°31'N 07°37'E).
1505 CTD 06, 400m, station 04 (43°34'N 07°31'E).
1545 CTD 07, 400 m, station 05 (43°37'N 07°25'E).
1625 CTD 08, 400 m, station 06 (43°39'N 07°21'E).
1640 Departure to the Nice harbour.
1710 Arrival at the Nice harbour.

Wednesday 11 February 2015 (UTC)

People on board: Alain Cariou, Guillaume De Liège, Yves Lamblard, Yves Le Guen, Didier Robin and Vincenzo Vellucci.

0630 Departure from the Nice harbour.
1000 Arrival at the BOUSSOLE site.
1005 Diving on the BOUSSOLE buoy for cleaning sensors and performing dark measurements.
1030 Direct connection with the buoy (AK DACNet connector) and data retrieval.
1105 C-OPS 01, 02, 03.
1200 Lunch.
1240 CTD 09, 400m with water sampling at 400, 200, 150, 80, 70, 50, 40, 30, 20, 10 and 5 m for HPLC and a_p , CDOM and TSM.
1310 Departure to the METEO-FRANCE buoy site.
1330 Maintenance on the METEO-FRANCE buoy.
1400 Secchi 01, 21m.
1450 Departure to the Nice harbour.
1800 Arrival at the Nice harbour.

Thursday 12 February 2015 (UTC)

People on board: Vincenzo Vellucci.

0630 Departure from the Nice harbour.
0950 Arrival at the BOUSSOLE site.
0955 CTD 10, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC and a_p , TSM, TA/TC and DO.
1100 Lunch.
1210 C-OPS 04, 05.
1300 Departure to the Nice harbour.
1550 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.
- The C-OPS commonly used on the BOUSSOLE missions was under calibration at *Biospherical*. The C-OPS used for this cruise was the one shared among the marine optics and remote sensing group at LOV. The instrument is similar to the BOUSSOLE one, yet has a Lu sensor instead of a Eu one.
- The plate with nails on the head of the buoy was broken, it was removed from the buoy. This plate is supposed to discourage the landing of birds.
- CTD #02: Niskin bottle #7 did not close, so there was no sampling at 40m. CTD #09: there was no sampling at 60m because the sample in the Niskin bottle #6 was lost when the CTD Rosette was moved on the deck.
- The anemometer of the METEO-FRANCE buoy was replaced but the sensor did not work correctly (no transmission of data).

Appendices

Cruise Summary Table for Boussole 156

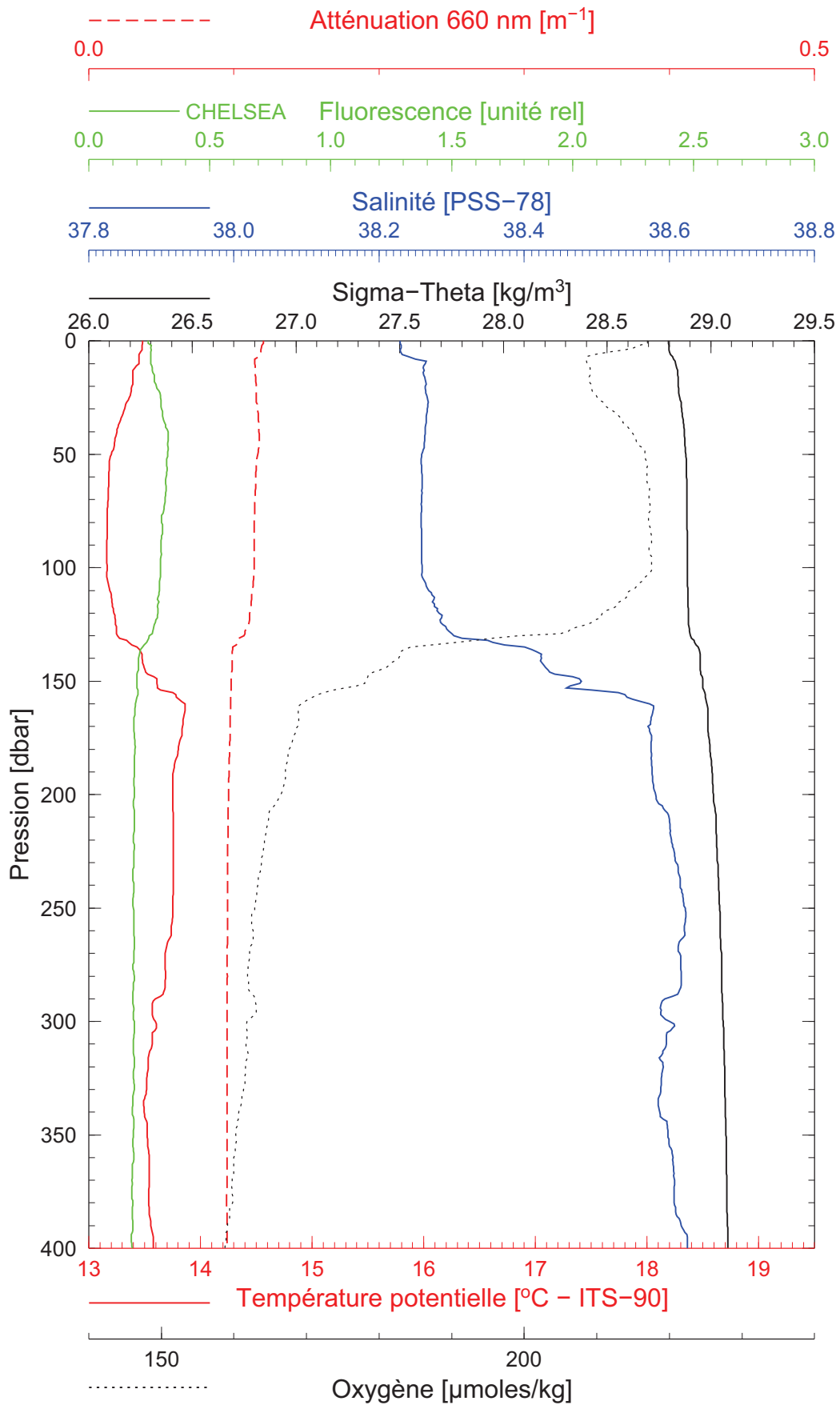
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					GMT (hour.min)	(min.sec)		(Degree)	(Minute)	(Degree)	(Minute)	Wind sp. (kn)	Wind dir.														
09/02/15			CTDBOUS001	HPLC & Ap	12:47	24:00	400	43	21.777	7	53.487	blue			0	12	213	1023.2	57		11.3	13.47	calm				
10/02/15			CTDBOUS002	HPLC & Ap	10:33	23:00	400	43	22.090	7	53.550	blue			0	4	185	1023.3	69		12.3	13.43	calm				
			CTDBOUS003		12:45	14:00	400	43	25.040	7	47.930	blue			0	5	99	1022.9	71		12.3	13.75	calm				
			CTDBOUS004		13:32	26:00	400	43	27.950	7	41.950	blue			0	6	92	1022.4	72		12.2	14.00	calm				
			CTDBOUS005		14:18	14:00	400	43	31.030	7	36.890	blue			0	6	115	1022.4	72		12.9	14.19	calm				
			CTDBOUS006		15:05	14:00	400	43	34.100	7	30.830	blue			0	5	114	1022.4	71		13.0	14.23	calm				
			CTDBOUS007		15:48	13:00	400	43	36.930	7	25.130	blue			0	4	92	1022.3	69		13.2	14.21	calm				
			CTDBOUS008		16:25	13:00	400	43	39.010	7	20.900	blue			0	4	102	1022.5	73		13.4	14.13	calm				
	11/02/15	bou_c-ops_150211_1103_001_data.csv				11:13	3:42	82.4	43	22.189	7	53.436	blue	none		0	5	109	1024.5	71	excellent	12.5		calm	0.4		no
bou_c-ops_150211_1103_002_data.csv					11:24	3:28	78.7	43	22.356	7	53.057	blue	none		0	5	109	1024.5	71	excellent	12.5		calm	0.4		no	
bou_c-ops_150211_1103_003_data.csv					11:34	3:13	63.6	43	22.465	7	52.547	blue	none		0	5	109	1024.5	71	excellent	12.5		calm	0.4		no	
			CTDBOUS009	HPLC, Ap, TSM & CDOM Secchi01	12:52	19:00	400	43	22.078	7	52.963	blue			0	3	92	1023.4	68		13.4	14.60	calm				
					14:00	4:00	21	43	22	7	49	blue			0					excellent			calm				
12/02/15			CTDBOUS010	HPLC, Ap, TSM, TA/TC & O ₂	09:59	20:00	400	43	21.967	7	53.741	overcast			6	10	68	1023.2	81		13.1	14.30	calm				
	bou_c-ops_150212_1153_001_data.csv				12:10	3:54	86.8	43	22.090	7	53.278	blue	none		0	14	69	1022.6	80	good	13.3		calm	0.6		yes	
	bou_c-ops_150212_1153_004_data.csv				12:39	4:22	99	43	22.909	7	52.696	blue	none		0	14	69	1022.6	80	good	13.3		calm	0.6		yes	

BOUSSOLE 156

09/02/2015

BOUS150209_01

BOUS001



Date 09/02/2015
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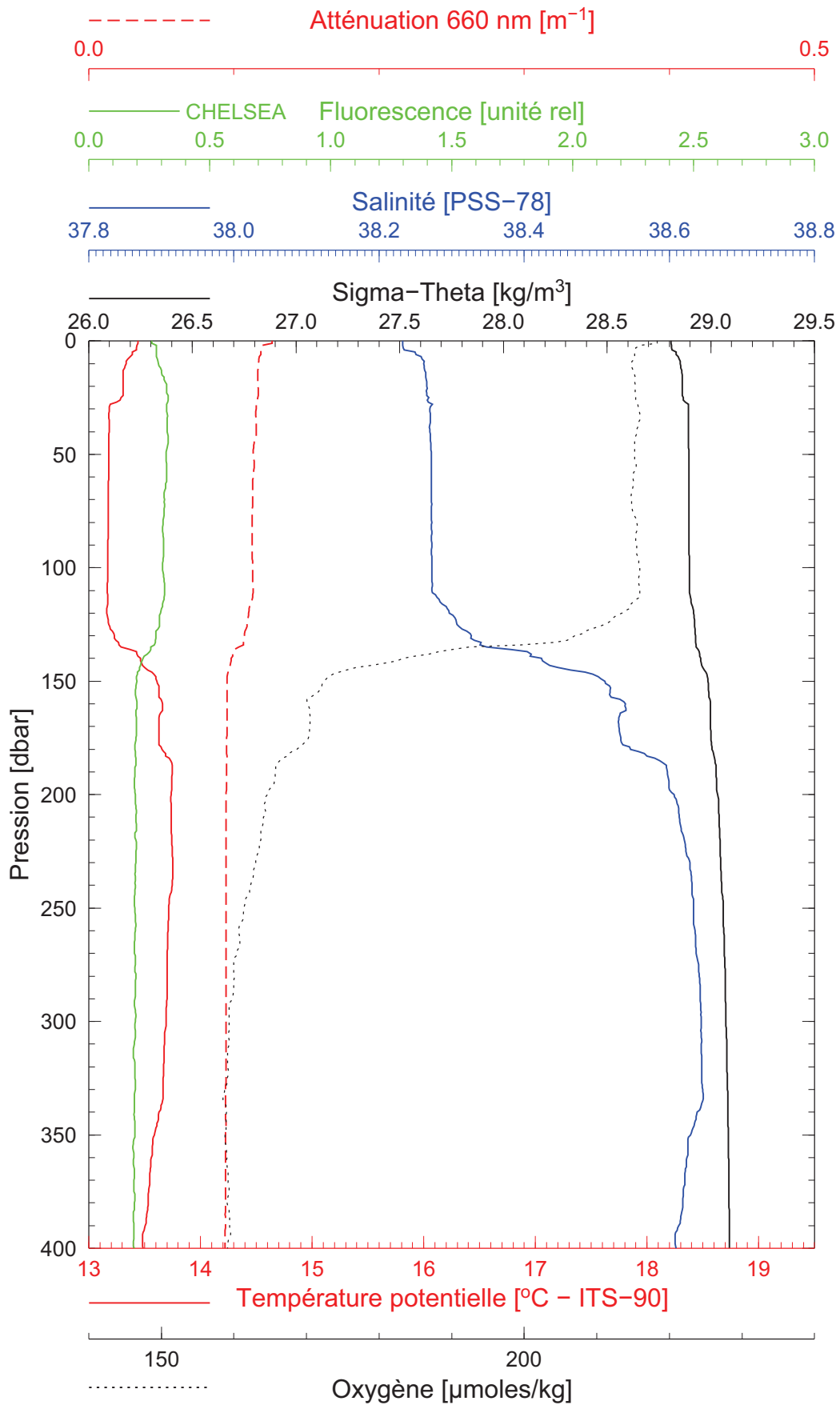
Latitude 43°21.777 N
Longitude 07°53.487 E

BOUSSOLE 156

10/02/2015

BOUS150210_01

BOUS002



Date 10/02/2015
Heure déb 10h 33min [TU]

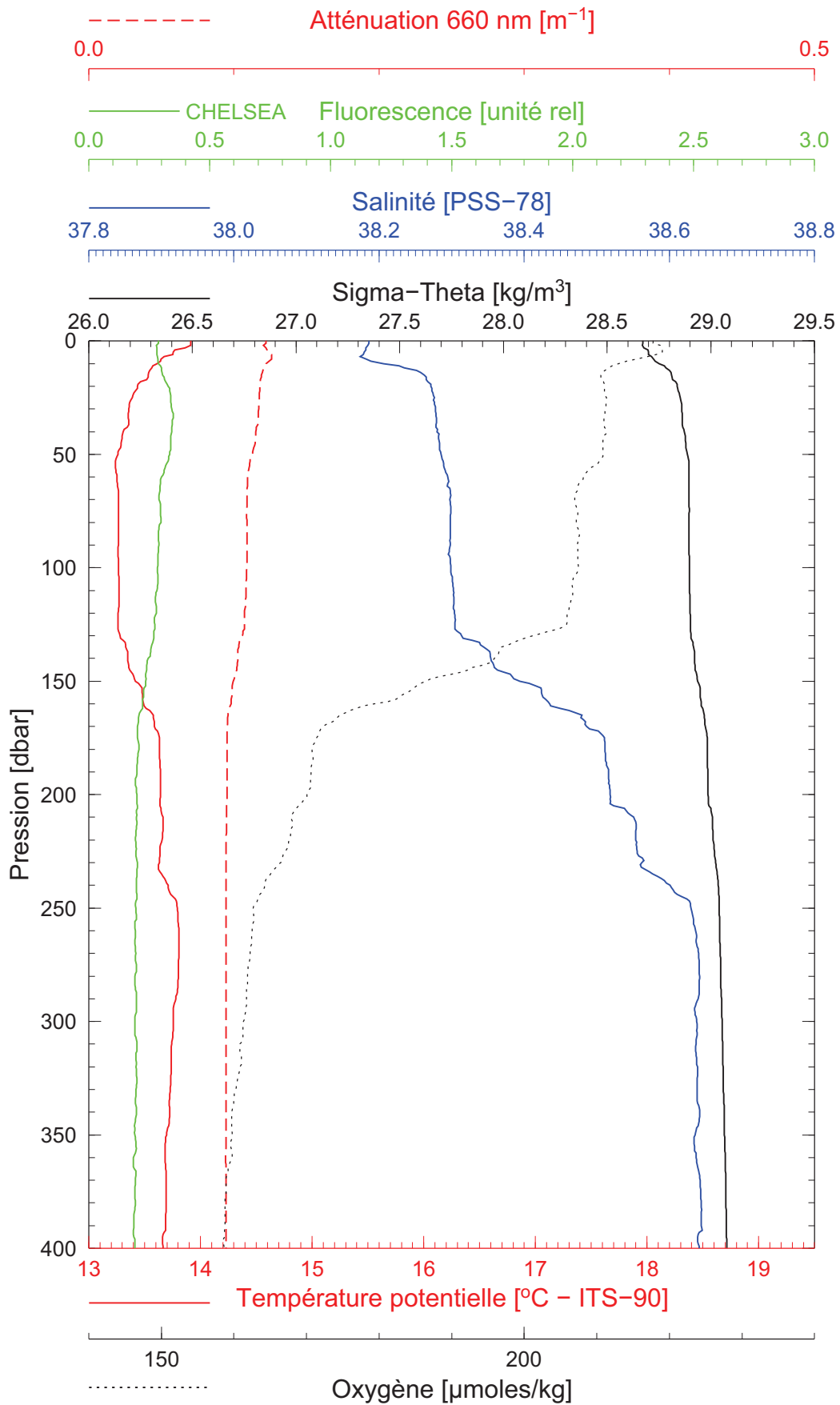
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BOUSSOLE 156

10/02/2015

BOUS150210_02

BOUS003



Date 10/02/2015
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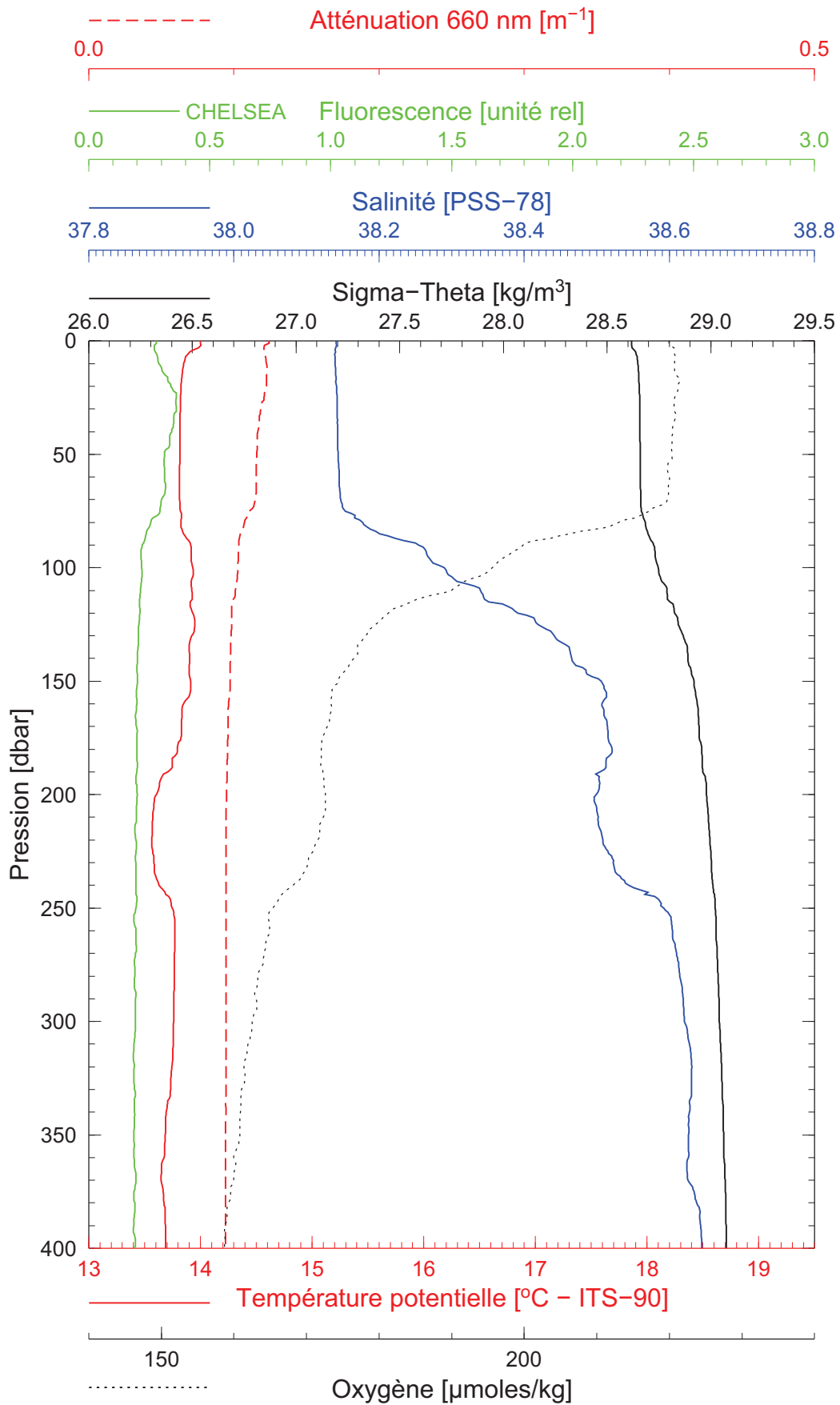
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BOUSSOLE 156

10/02/2015

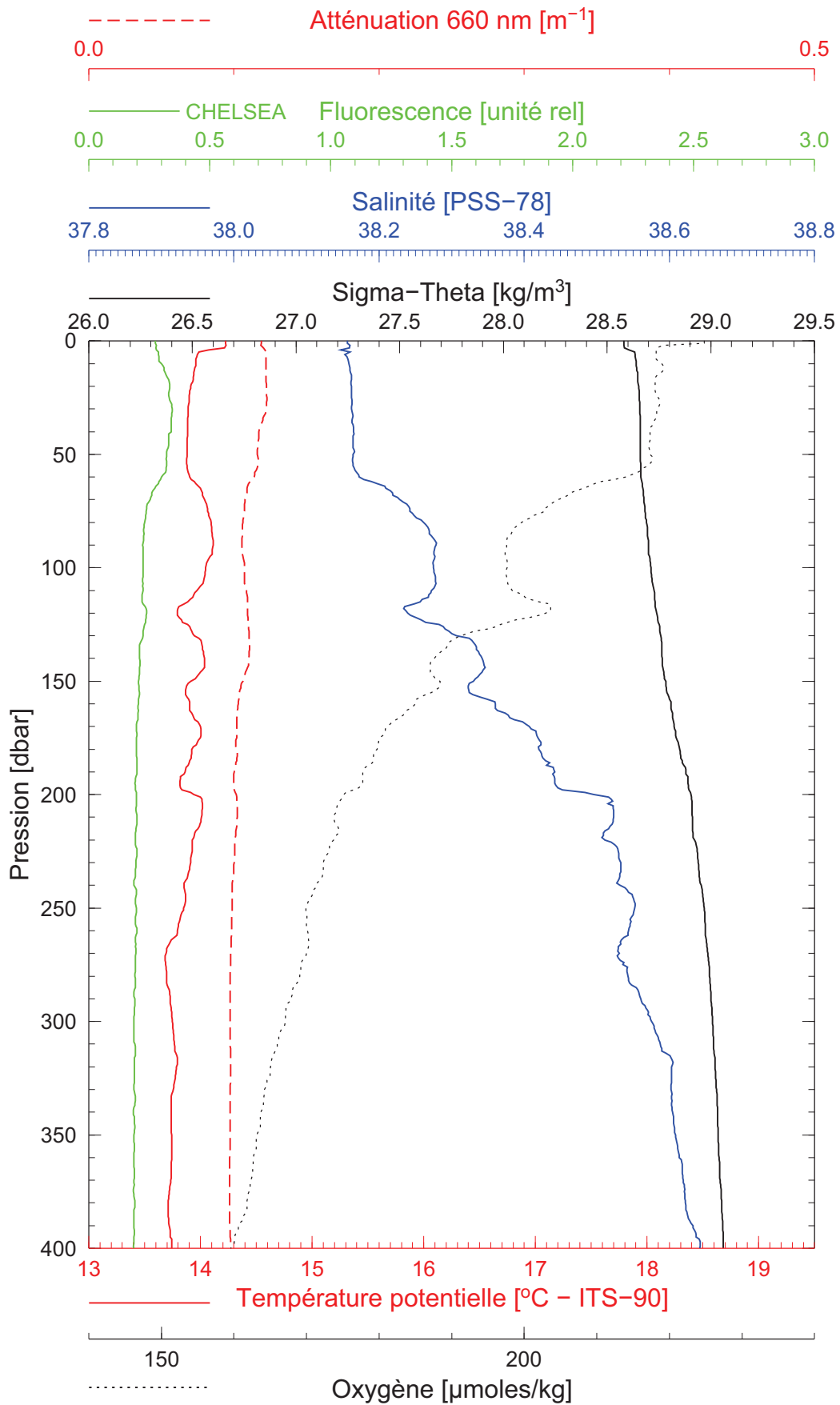
BOUS150210_03

BOUS004



Date 10/02/2015
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Longitude 07°41.950 E



Date 10/02/2015
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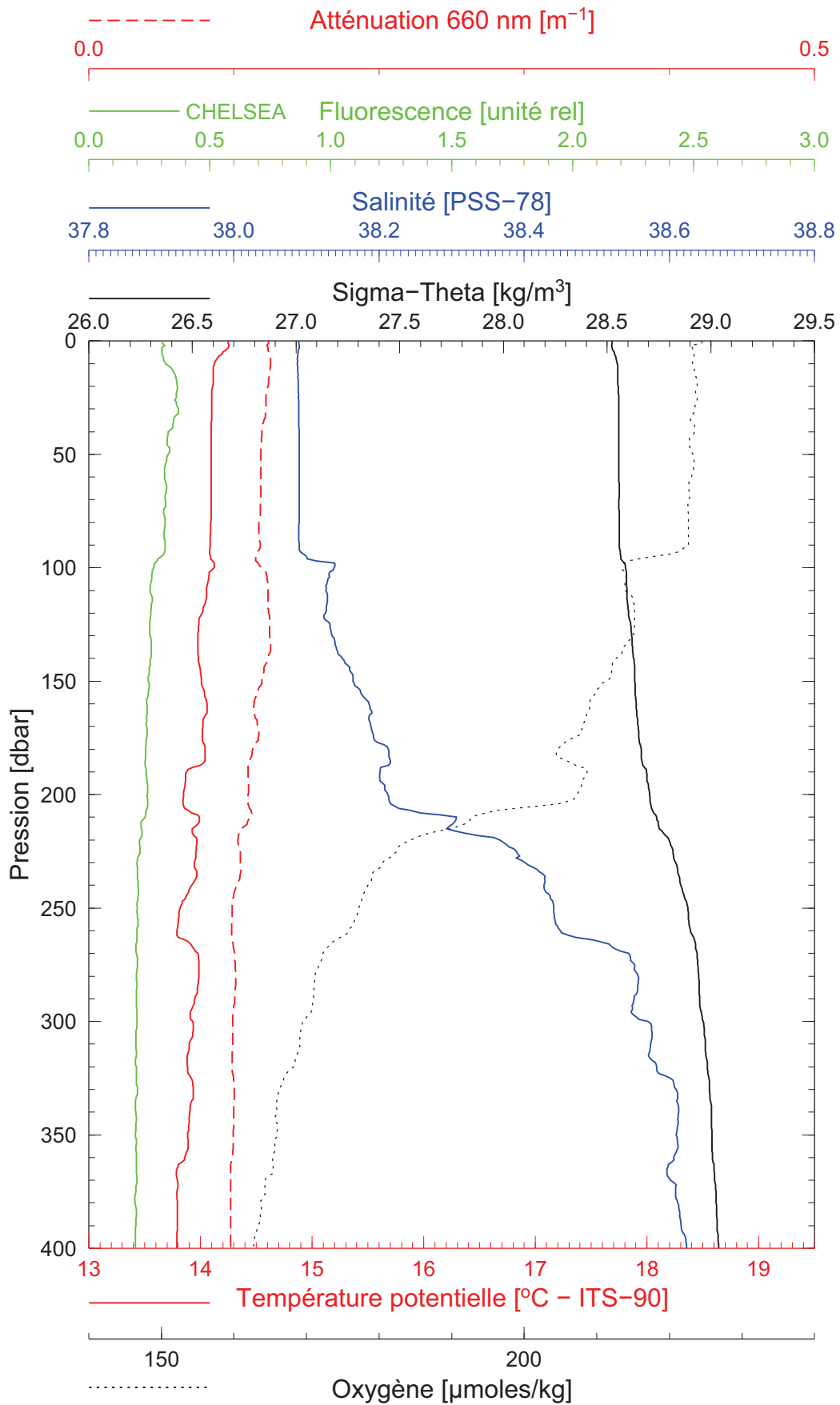
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BOUSSOLE 156

10/02/2015

BOUS150210_05

BOUS006



Date 10/02/2015
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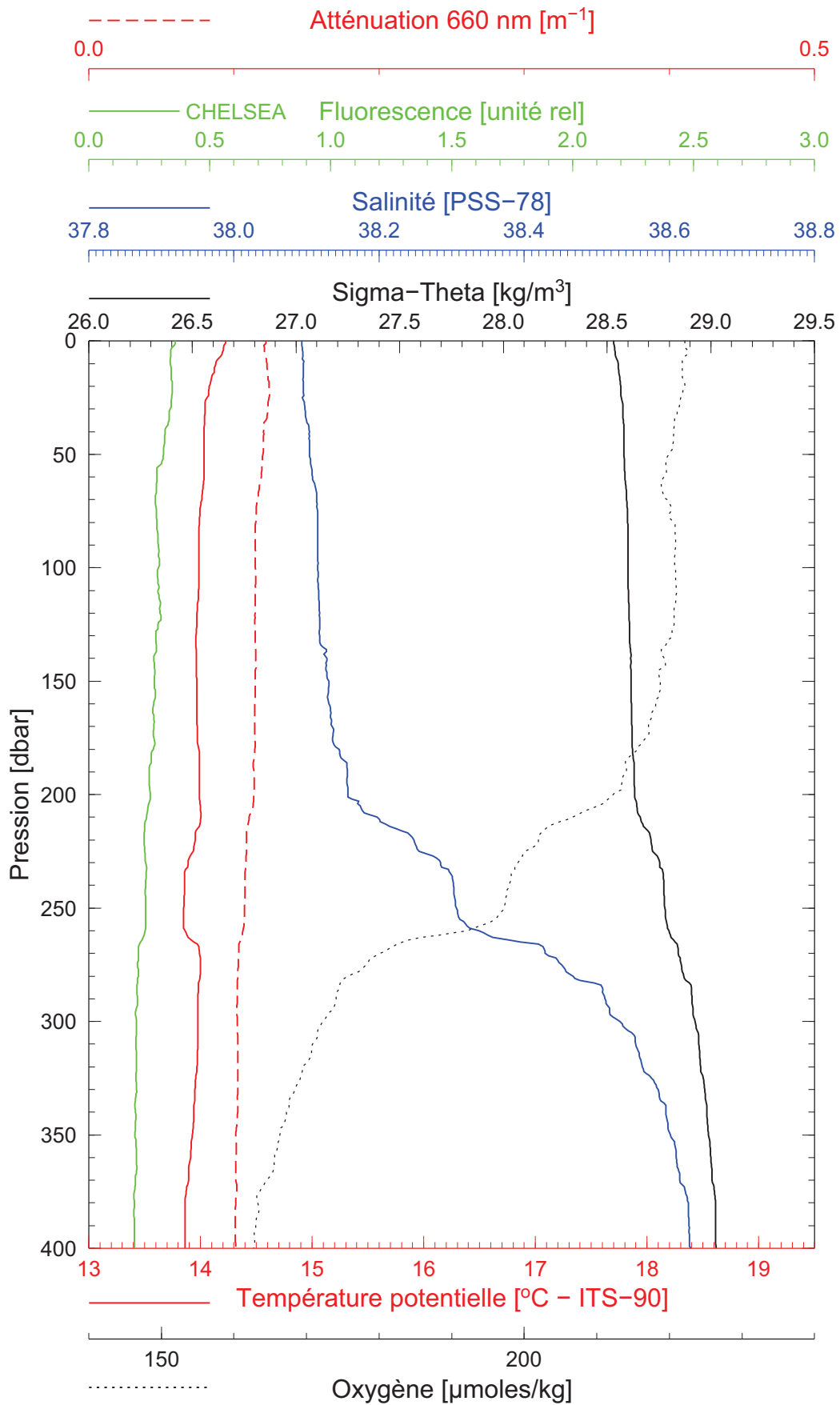
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BOUSSOLE 156

10/02/2015

BOUS150210_06

BOUS007



Date 10/02/2015
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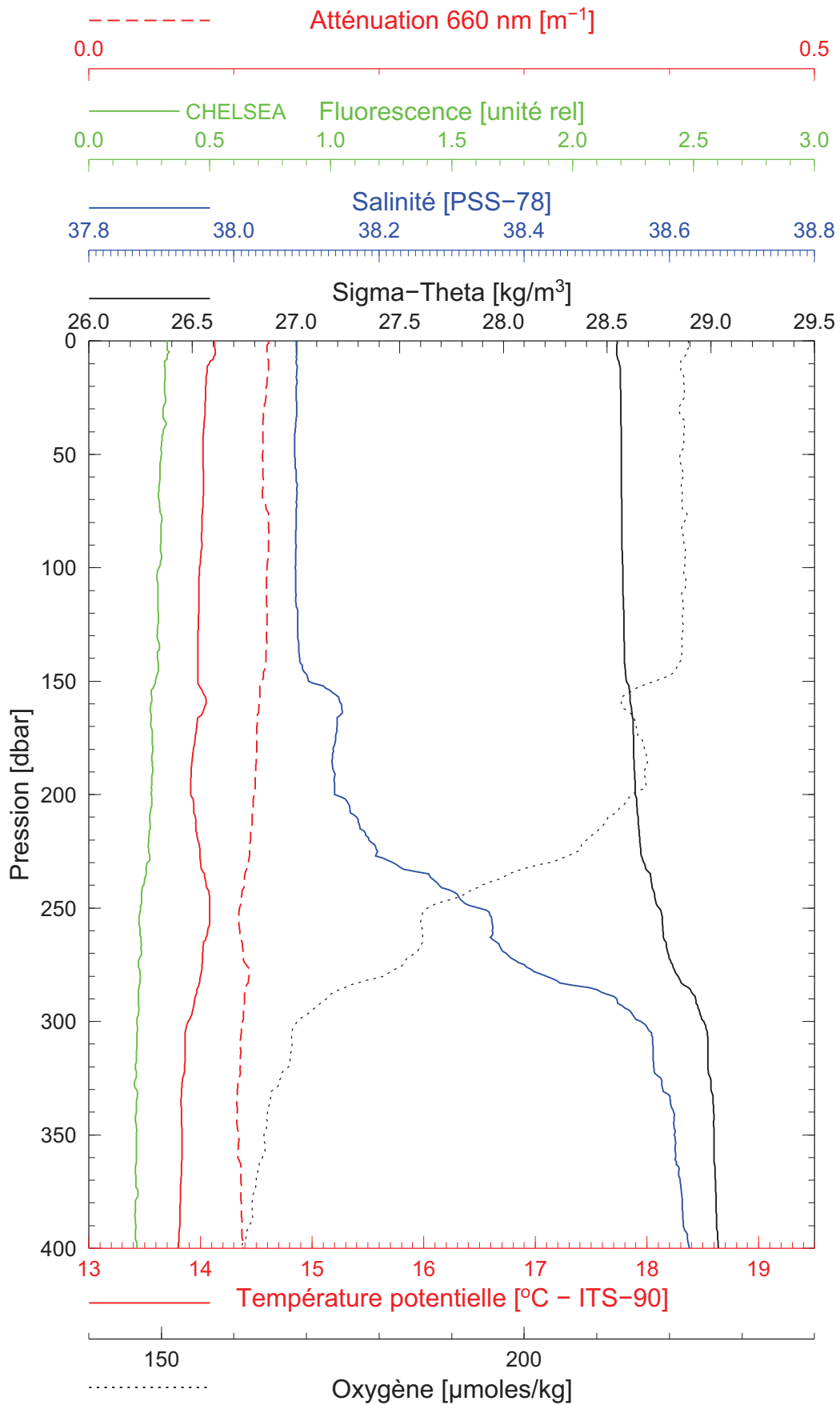
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BOUSSOLE 156

10/02/2015

BOUS150210_07

BOUS008



Date 10/02/2015
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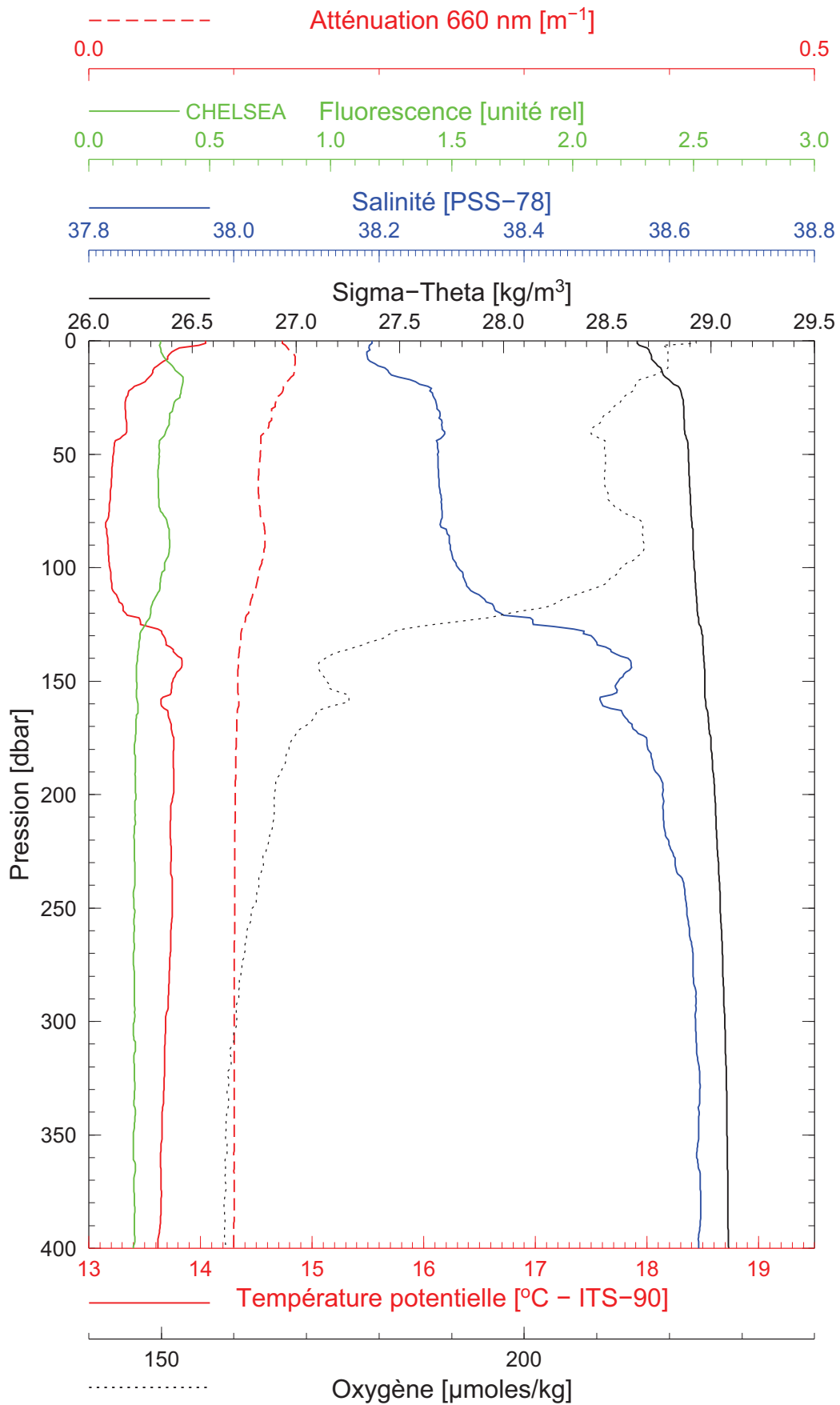
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Longitude 07°20.900 E

BOUSSOLE 156

11/02/2015

BOUS150211_01

BOUS009



Date 11/02/2015
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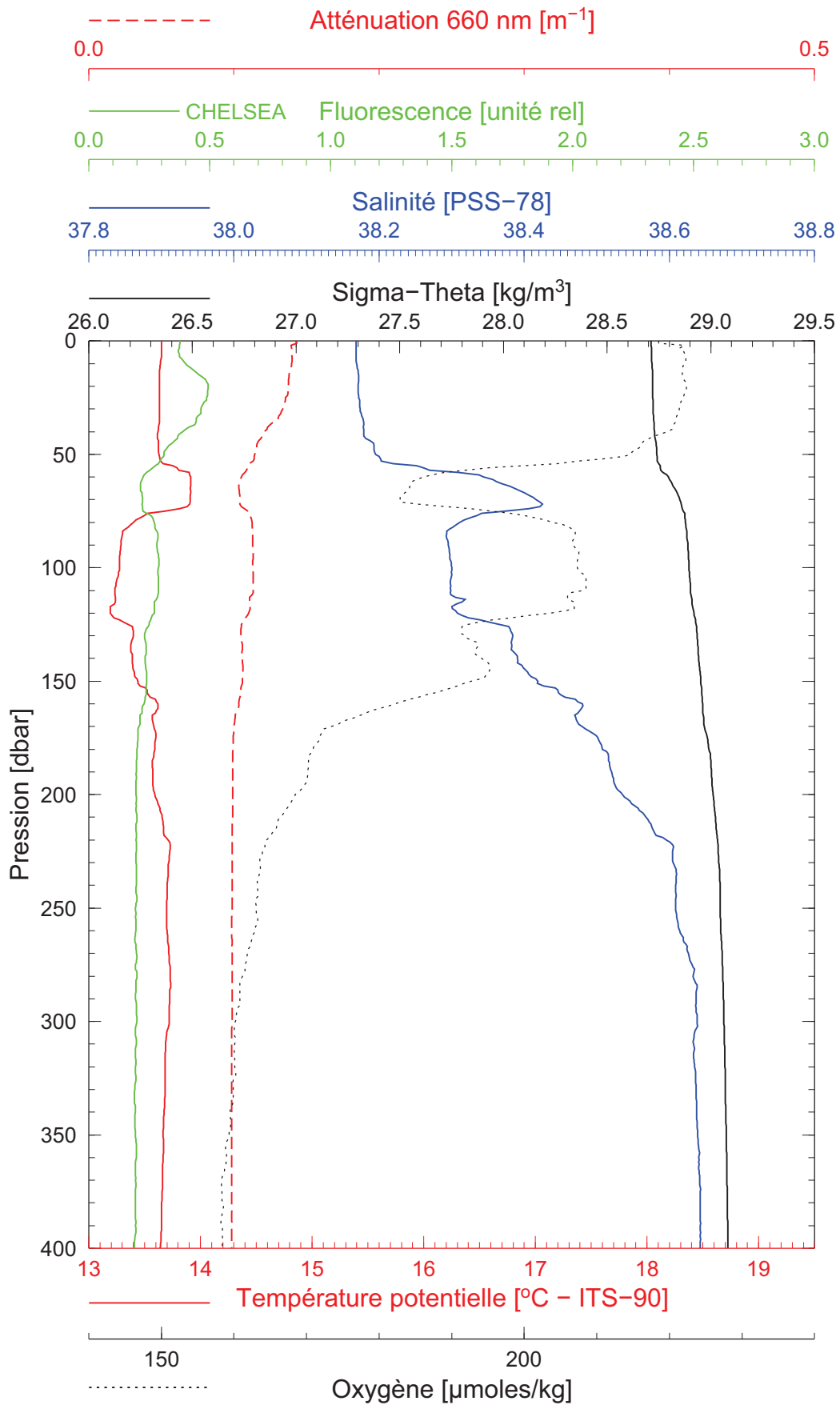
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BOUSSOLE 156

12/02/2015

BOUS150212_01

BOUS010



Date 12/02/2015
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Latitude 43°21.967 N
Longitude 07°53.741 E