BOUSSOLE Monthly Cruise Report

Cruise 152
October 23– 26, 2014

Duty Chief: Melek Golbol (golbol@obs-vlfr.fr)
Vessel: R/V Téthys II
(Captain: Joël Perrot)

Science Personnel: Jean De Vaugelas, Melek Golbol, David Luquet, Grigor Obolensky, Anouck Ody, and Didier Robin.

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

Preparation of the divers before diving on the BOUSSOLE buoy. The buoy was completely underwater because of strong currents.

BOUSSOLE project

ESA/ESRIN contract N° 13226/10/I-NB

December 19, 2014

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'Etudes Spatiales, France

Centre National de la Recherche Scientifique, France

Université Pierre & Marie Curie, France

Observatoire Océanologique de Villefranche/mer, 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 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 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 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

No additional operations.

Cruise Summary

The first day, the bad weather prevented departure from the Nice harbour. The second day was used to perform the diving operations, two CTD casts with water sampling, optical profiles, CIMEL measurements and a Secchi disk at the BOUSSOLE site. The third day was used for a CTD cast with water sampling, optical profiles and a Secchi disk at the BOUSSOLE site. The fourth day, bad weather prevented work at the BOUSSOLE site.

Thursday 23 October 2014

Bad weather prevented departure from the Nice harbour.

Friday 24 October 2014

The sea state was smooth with a gentle breeze. The sky was blue with an excellent visibility. When arriving at the BOUSSOLE site, the buoy was not visible and was completely underwater because of strong currents. Divers went on the dinghy and searched the buoy. After finding the buoy, they checked it and cleaned the sensors. Then 2 CTD casts with water sampling, 3 CIMEL measurement and 3 C-OPS profiles were performed at the BOUSSOLE site. The buoy eventually reappeared above the surface.

Saturday 25 October 2014

The sea state was smooth with a moderate breeze. The sky was blue with a good visibility. 3 C-OPS profiles, 1 Secchi disk and 2 CTD cast were performed at the BOUSSOLE site. The first CTD cast was stopped at 240 m depth because fishing lines were present in the area. Water was not sampled during the first CTD cast. The second CTD cast was performed with water sampling. The buoy was out of surface but the bad weather did not permit us to download directly the data from the buoy. Wireless connection with the buoy was attempted but failed. Finally, the CTD transect was totally completed.

Sunday 26 October 2014

We went to the BOUSSOLE site. The sea was rough, and when we arrived at the BOUSSOLE site, the buoy was not visible because it was completely underwater. It was not possible to work in the area and to attempt another wireless connection to download data.

Pictures taken during this cruise can be found at:
https://plus.google.com/photos/114686870380724925974/albums/6088615952414383089?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

Thursday 23 October 2014

Bad weather prevented departure from the Nice harbour.

Friday 24 October 2014 (UTC)

People on board: Jean De Vaugelas, Melek Golbol, David Luquet, Grigor Obolensky, Anouck Ody and Didier Robin.

0505 Departure from the Nice harbour.
0830 Arrival at the BOUSSOLE site. The buoy was not visible.
0930 Diving on the BOUSSOLE buoy for inspecting the state and cleaning sensors.
1125 CTD 01, 400 m with water sampling at 200, 150, 80, 70, 60, 40, 30, 20, 10 and 5 m for HPLC, $a_{p,}$ and TSM.
1135 CIMEL 01, 02, 03.
1220 C-OPS 01, 02, 03.
1335 CTD 02, 400 m with water sampling at 400, 200, 80, 70, 60, 50, 40, 30, 20 and 5 m for HPLC, $a_{p,}$ and CDOM.
1430 Departure to the Nice harbour.
1800 Arrival at the Nice harbour.

Saturday 25 October 2014 (UTC)

People on board: Melek Golbol, Grigor Obolensky and Anouck Ody.

0515 Departure from the Nice harbour.
0830 Arrival at the BOUSSOLE site.
0835 C-OPS 04, 05, 06.
0940 CTD 03, 240m (stopped because of fishing lines).
1010 CTD 04, 400m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, $a_{p,}$ and TA/TC.
1040 Secchi 01, 23m.
1100 Attempts of CISCO connection with the buoy: failed.
1110 Departure to the first transect station.
1210 CTD 05, 400m, station 01 (43°25'N 07°48'E).
1310 CTD 06, 400m, station 02 (43°28'N 07°42'E).
1410 CTD 07, 400m, station 03 (43°31'N 07°37'E).
1515 CTD 08, 400m, station 04 (43°34'N 07°31'E).
1610 CTD 09, 400 m, station 05 (43°37'N 07°25'E).
1705 CTD 10, 400 m, station 06 (43°39'N 07°21'E).
1730 Departure to the Nice harbour.
1810 Arrival at the Nice harbour.

Sunday 26 October 2014 (UTC)

People on board: Melek Golbol and Grigor Obolensky.

0615 Departure from the Nice harbour.
0930 Arrival at the BOUSSOLE site: Bad weather prevented the work at BOUSSOLE site.
0945 Departure to the Nice harbour.
1235 Arrival at the Nice harbour.

Problems identified during the cruise

- The hydroDAS was inadvertently not turned on during the CTD 02 cast. So, there was not IOP profiles with the CTD 02 cast.

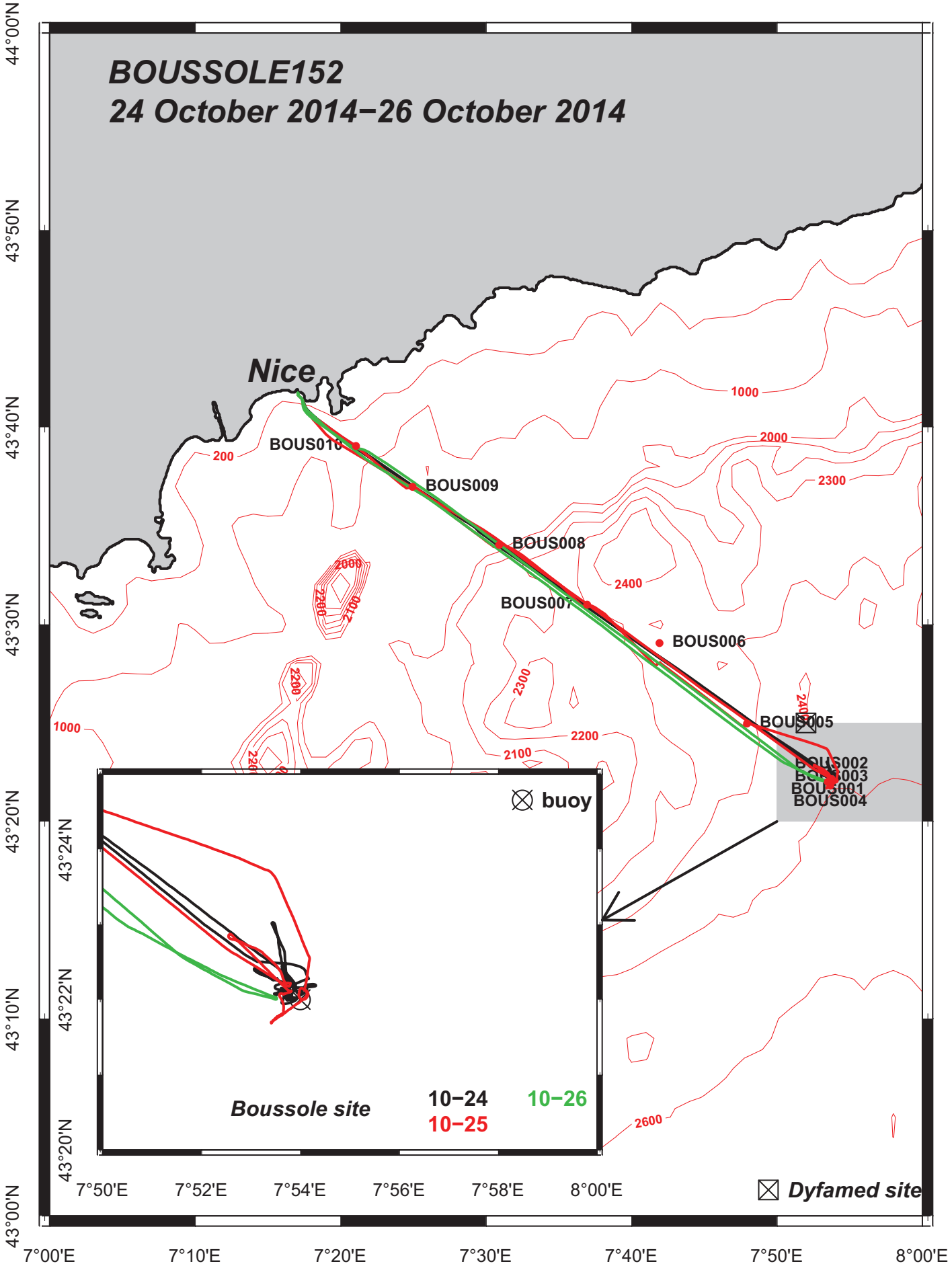
- There was problems with the IOP data recorded from the CTD 04 to CTD 10. Only data of the CTD 01 and the CTD 02 at the BOUSSOLE site were OK. This was probably due to a presence of a corrupted file in the HydroDAS (data logger of the IOP package). This problem could be resolved by deleting the corrupted file from the HydroDAS.

- During this cruise, several problems with Niskin bottles appeared:
  CTD 01: the Niskin bottle #6 did not close, so there was no sampling at 50m.
  CTD 02: only 9 depths were sampled because the Niskin bottle #3 was not well closed, so the sample at 150m was lost. The Niskin bottles #4 and #5 were inadvertently closed together, so there was no sampling at 10m.

Appendices

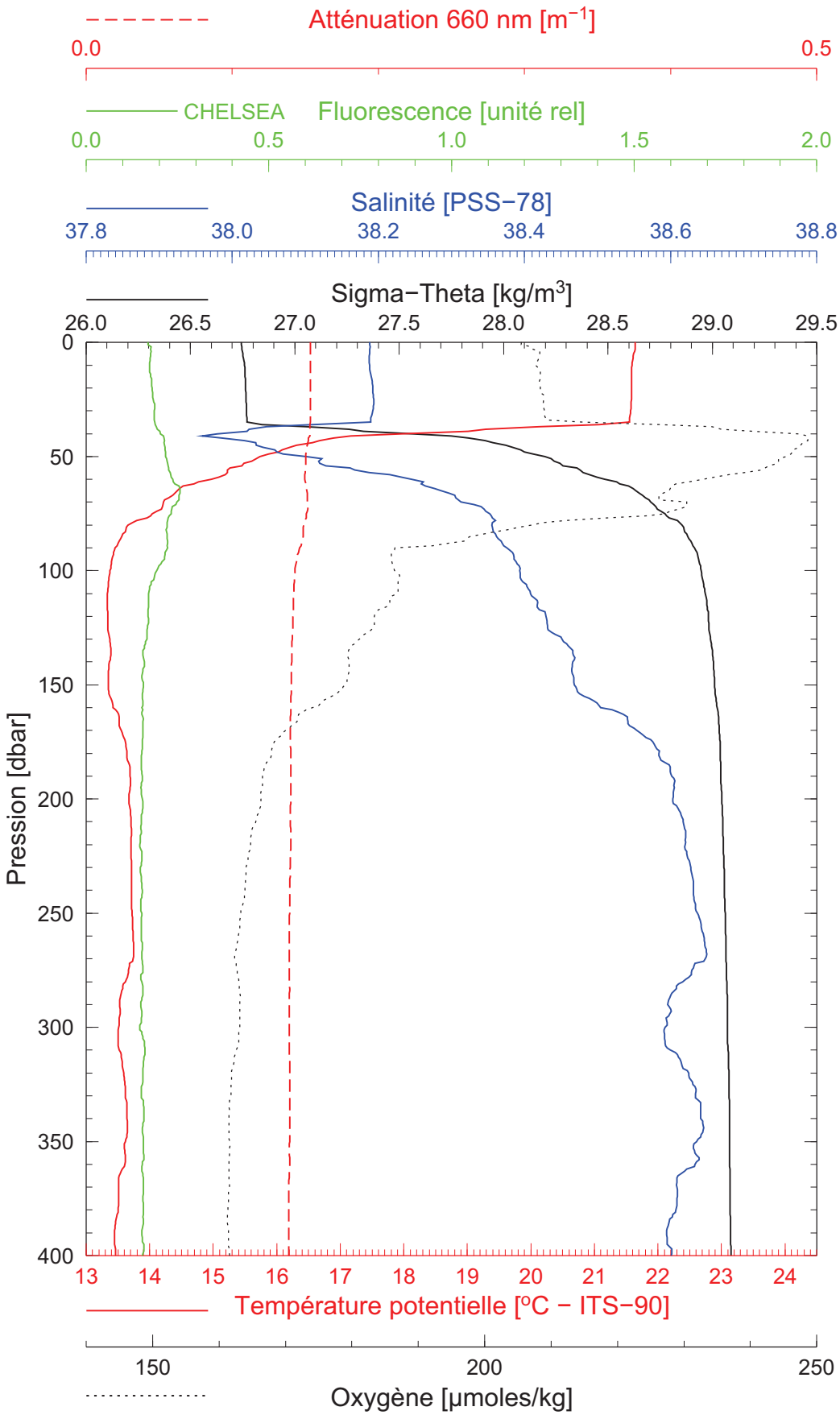
Cruise Summary Table for Boussole 152

Date	Black names	Profile names	CTD notées	Other sensors	Start Time	Duration	Depth max	Latitude (N)		longitude					Weather							Sea		
	(file ext: ".raw")	(file extension: ".raw")			GMT (hour.min)	(min.sec)	(meter)	(Degree)	(Minute)	(Degree)	(Minute)	Sky	Clouds	Quantity (#/8)	Wind sp. (kn)	Wind dir.	Atm. Pressure (hPa)	Humidity (%)	Visibility	T air	T water	Sea	Swell H (m)	Swell dir.	Whitecaps
23/10/14	Bad weather																							
			CTDBOUS001	HPLC, Ap & TSM	11:23	31:00	400	43	22.261	7	53.500	blue		1	10	250	1013.0	47		20.6	21.64	calm			
				CIMEL01	11:33	NA		43	22.292	7	53.396	blue		0			NA		excellent						
				CIMEL02	11:48	4:00		43	22.292	7	53.396	blue		0			NA		excellent						
				CIMEL03	11:53	3:00		43	22.292	7	53.396	blue		0			NA		excellent						
24/10/14	bou_c-ops_141024_1208_001_data.csv				12:09	1:20																		
		bou_c-ops_141024_1208_002_data.csv			12:19	3:45	96.4	43	22.286	7	53.754	blue		0	8.3	253	1012.5	45	excellent	21.2		calm	0.6		no
		bou_c-ops_141024_1208_003_data.csv			12:31	3:38	94.6	43	22.563	7	53.604	blue		0	8.3	253	1012.5	45	excellent	21.2		calm	0.6		no
		bou_c-ops_141024_1208_004_data.csv			12:42	3:39	95.7	43	22.800	7	53.554	blue		0	8.3	253	1012.5	45	excellent	21.2		calm	0.6		no
	bou_c-ops_141024_1208_005_data.csv				12:56	2:44																		
			CTDBOUS002	HPLC, Ap & CDOM	13:34	34:00	400	43	22.159	7	53.751	blue		1	10	219	1012.0	59		20.7	21.40	calm			
	bou_c-ops_141025_0828_001_data.csv				08:33	1:20																		
		bou_c-ops_141025_0828_002_data.csv			08:43	3:33	91.6	43	22.391	7	53.586	blue		1	11.9	71	1017.4	59	good	20.9		calm	0.6		no
		bou_c-ops_141025_0828_003_data.csv			08:55	3:45	97.3	43	22.560	7	53.335	blue		1	11.9	71	1017.4	59	good	20.9		calm	0.6		no
		bou_c-ops_141025_0828_004_data.csv			09:09	3:40	95.4	43	22.716	7	52.950	blue		1	11.9	71	1017.4	59	good	20.9		calm	0.6		no
	bou_c-ops_141025_0828_005_data.csv				09:32	1:54																		
			CTDBOUS003		09:42	13:00	240	43	22.092	7	53.750	blue		1	15	68	1017.8	60		20.3	21.49	calm			
25/10/14			CTDBOUS004	HPLC, Ap, TSM & TA/TC	10:06	27:00	400	43	21.824	7	53.671	blue		1	15	100	1017.9	63		20.2	21.48	calm			
				Secchi01	10:40	4:00	21	43	22	7	54	blue		1					good			calm			
			CTDBOUS005		12:11	21:00	400	43	24.973	7	47.945	blue		3	15	68	1017.6	63		20.3	21.55	calm			
			CTDBOUS006		13:09	26:00	400	43	28.054	7	41.929	blue		2	12	89	1017.2	65		20.4	21.59	calm			
			CTDBOUS007		14:11	26:00	400	43	31.001	7	36.954	blue		1	13	80	1017.5	60		20.2	21.72	calm			
			CTDBOUS008		15:13	20:00	400	43	34.036	7	30.910	blue		1	10	91	1017.6	61		20.4	21.60	calm			
			CTDBOUS009		16:09	24:00	400	43	36.979	7	24.948	twighlight		1	12	80	1017.8	56		20.1	21.98	calm			
			CTDBOUS010		17:05	22:00	400	43	39.052	7	21.064	night		8	10	92	1018.2	59		20.1	21.91	calm			
26/10/14	Bad weather																							


BOUSSOLE152
24 October 2014−26 October 2014
Nice
BOUS010
BOUS009
BOUS008
BOUS007
BOUS006
BOUS005
BOUS002
BOUS003
BOU3001
BOUS004
200
1000
2000
2300
2400
2200
2100
2600
44°00'N
43°50'N
43°40'N
43°30'N
43°20'N
43°10'N
43°00'N
7°00'E
7°10'E
7°20'E
7°30'E
7°40'E
7°50'E
8°00'E
buoy
43°24'N
43°22'N
43°20'N
7°50'E
7°52'E
7°54'E
7°56'E
7°58'E
8°00'E
Boussole site
10−24
10−25
10−26
Dyfamed site

BOUSSOLE 152 **24/10/2014** **BOUS141024_01**

BOUS001

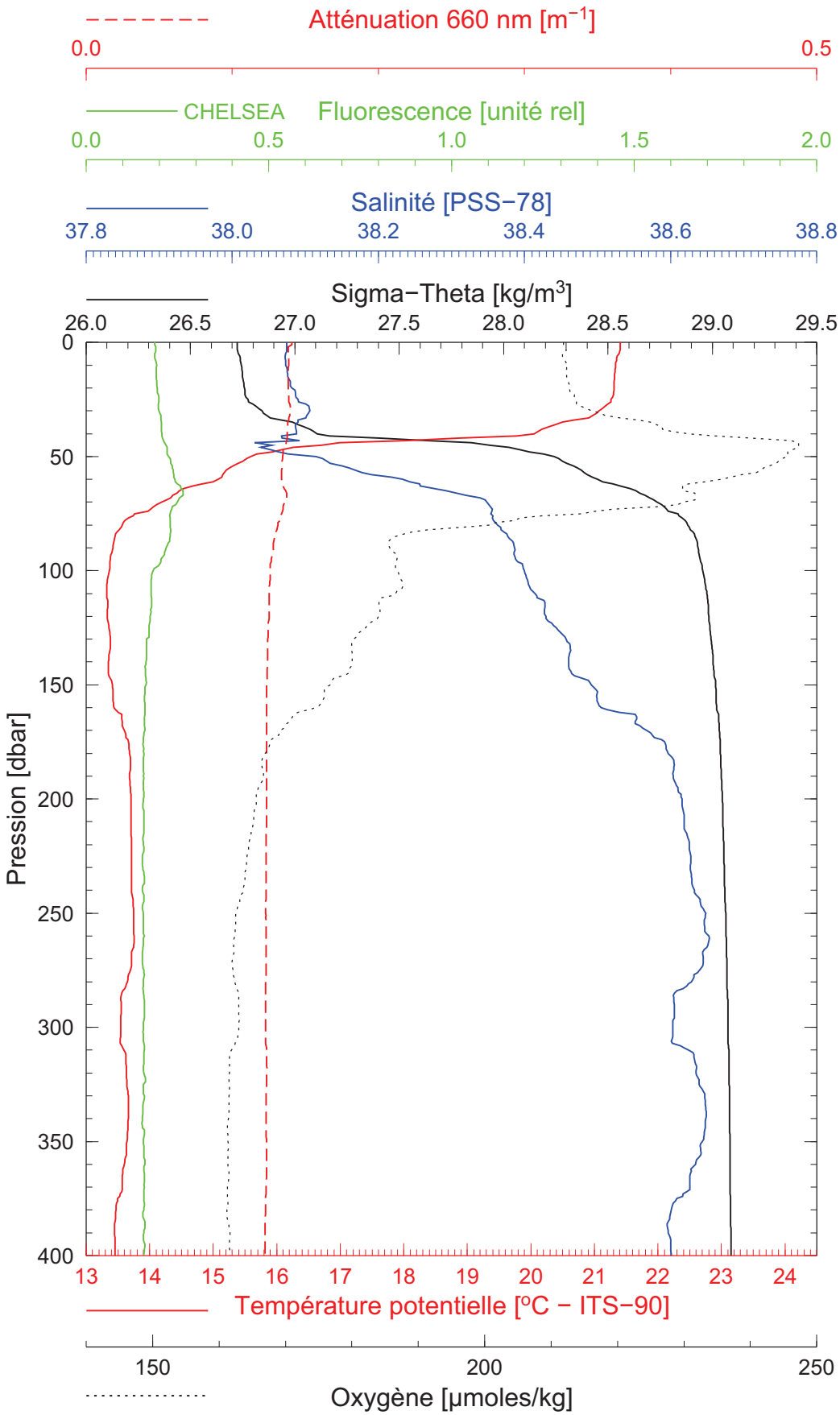


Date *24/10/2014* *Latitude* *43°22.013 N*

Heure déb *11h 23min [TU]* *Longitude* *07°53.500 E*

BOUSSOLE 152 **24/10/2014** **BOUS141024_02**

BOUS002

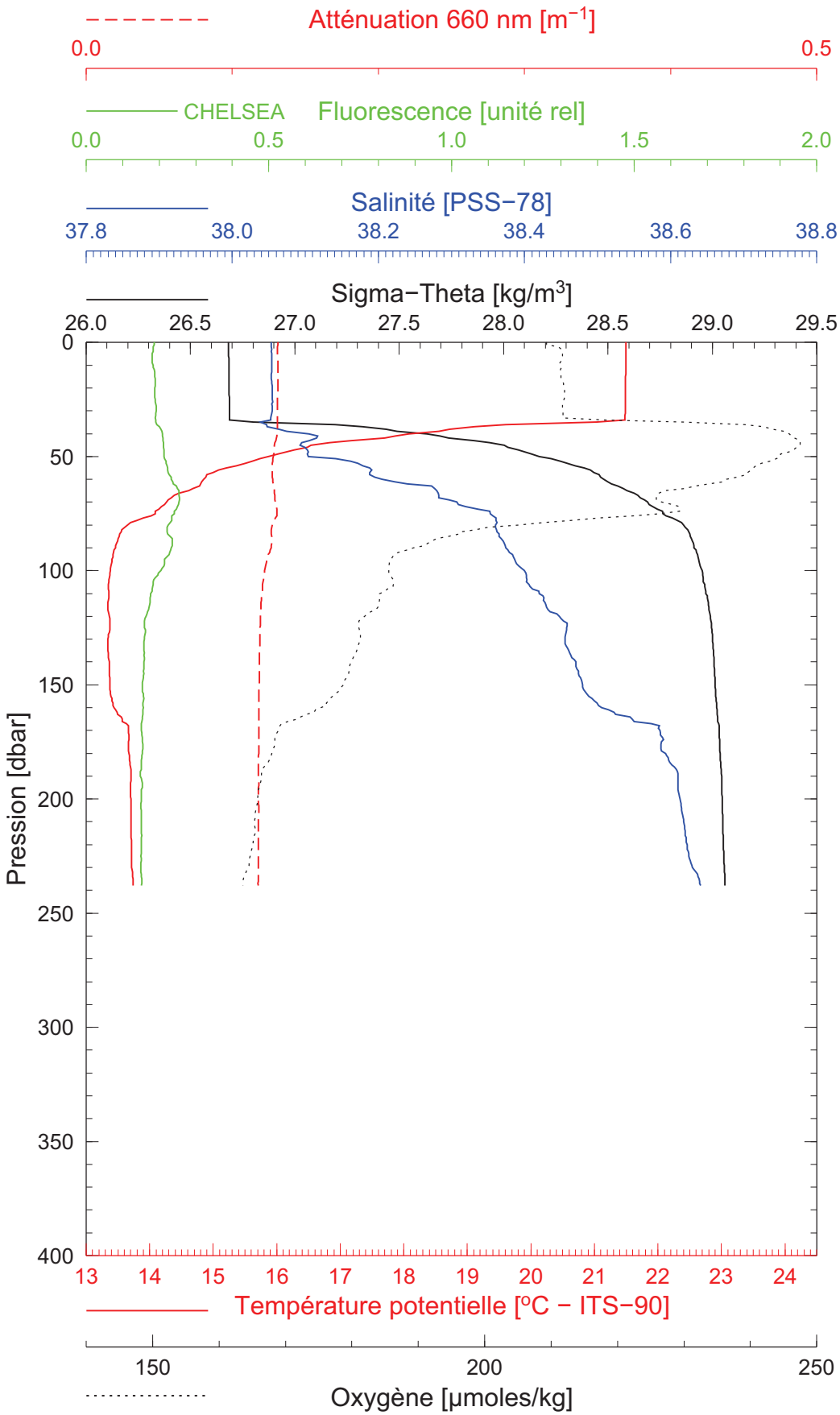


Date *24/10/2014* *Latitude* *43°22.159 N*

Heure déb *13h 34min [TU]* *Longitude* *07°53.751 E*

BOUSSOLE 152 **25/10/2014** **BOUS141025_01**

BOUS003

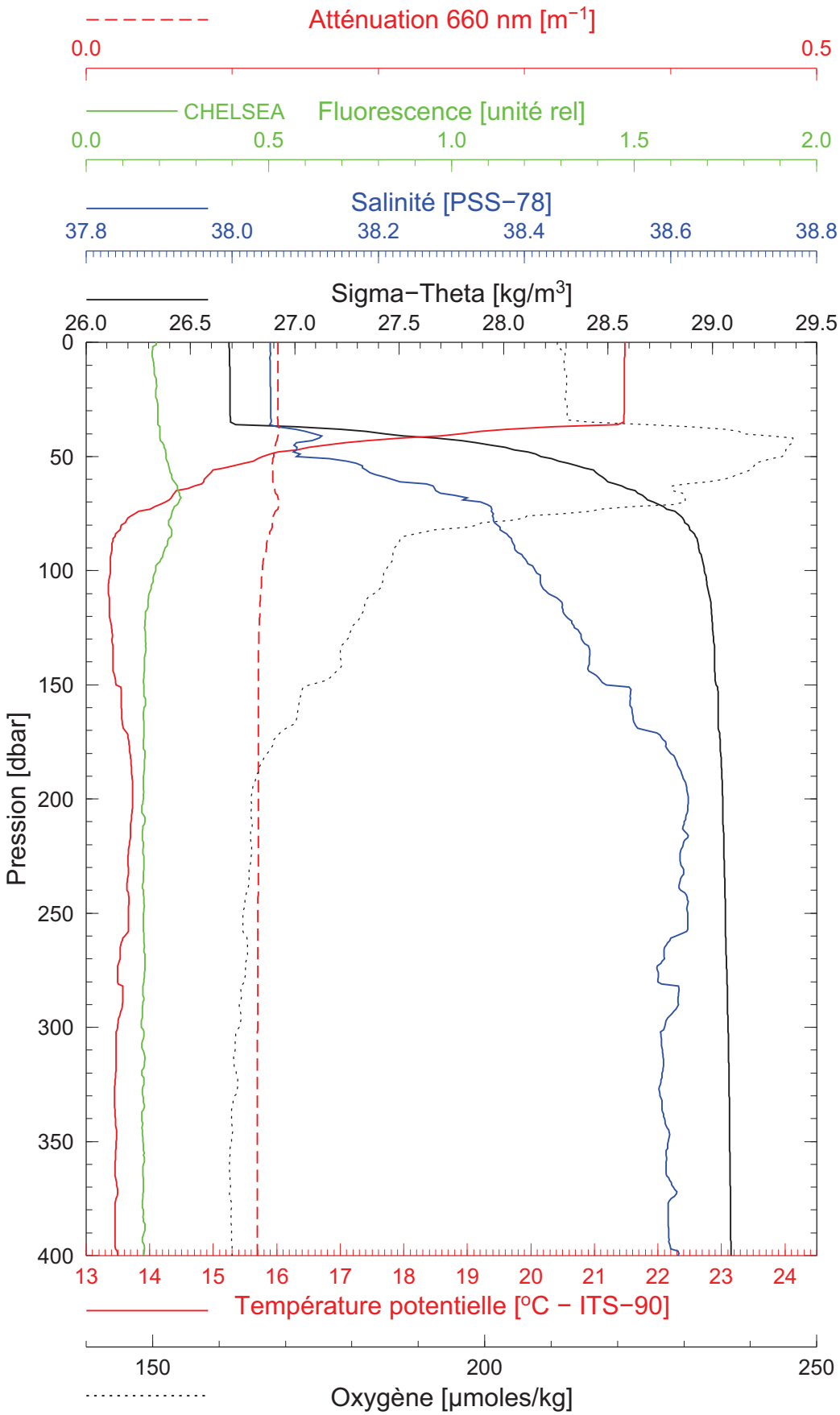


Date *25/10/2014* *Latitude* *43°22.092 N*

Heure déb *09h 42min [TU]* *Longitude* *07°53.750 E*

BOUSSOLE 152 **25/10/2014** **BOUS141025_02**

BOUS004

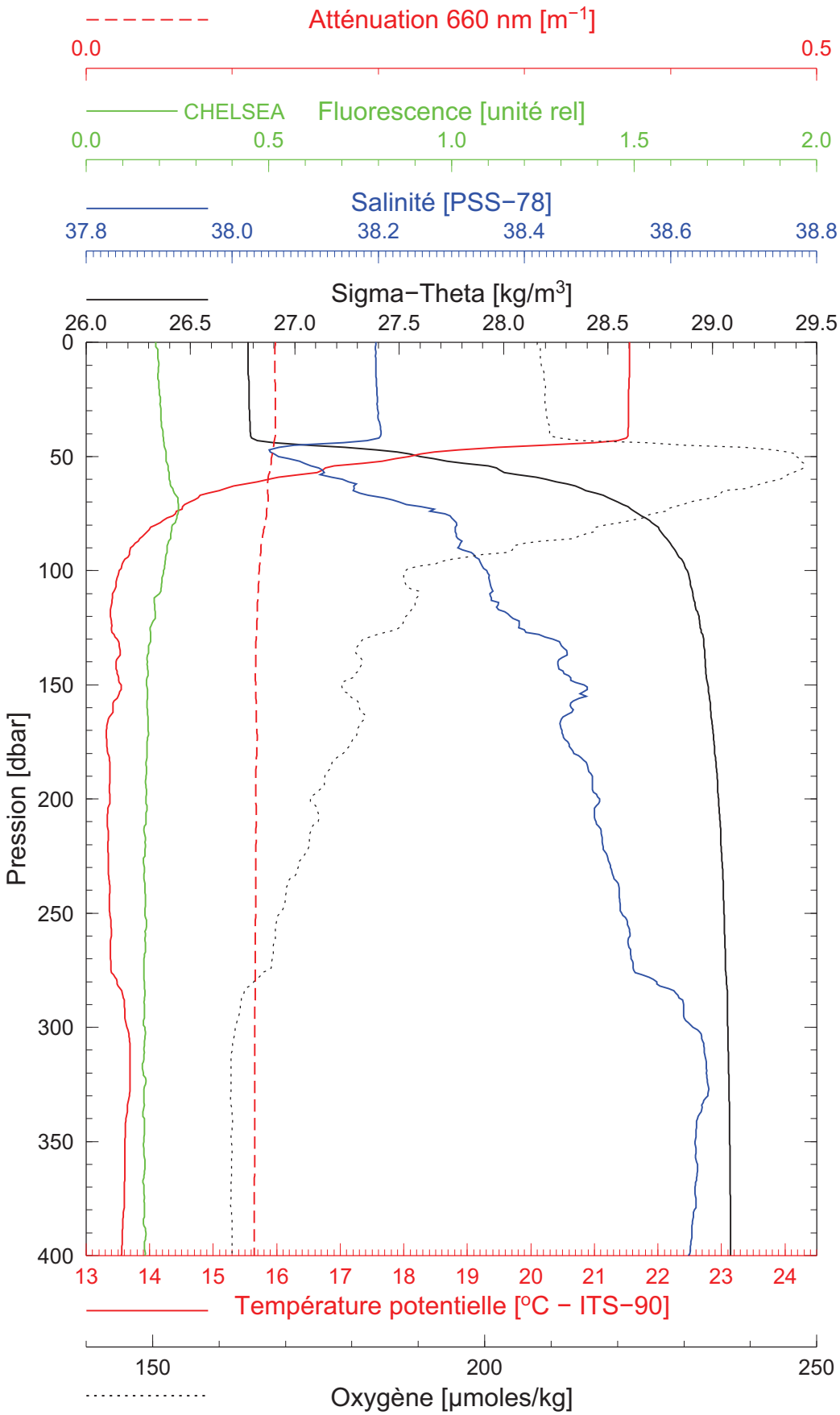


Date *25/10/2014* *Latitude* *43°21.824 N*

Heure déb *10h 06min [TU]* *Longitude* *07°53.671 E*

BOUSSOLE 152 **25/10/2014** **BOUS141025_03**

BOUS005

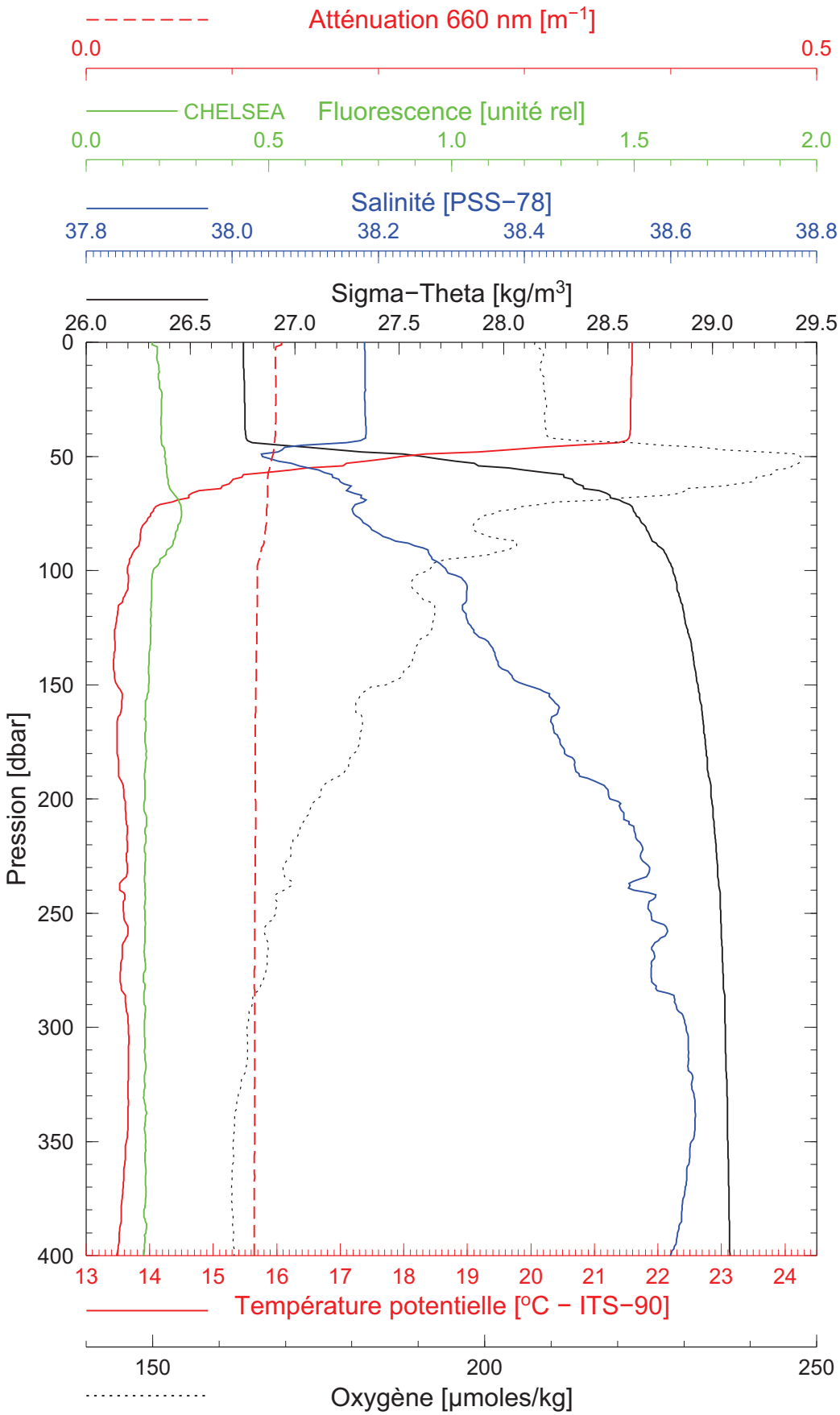


Date *25/10/2014* *Latitude* *43°24.973 N*

Heure déb *12h 11min [TU]* *Longitude* *07°47.945 E*

BOUSSOLE 152 **25/10/2014** **BOUS141025_04**

BOUS006

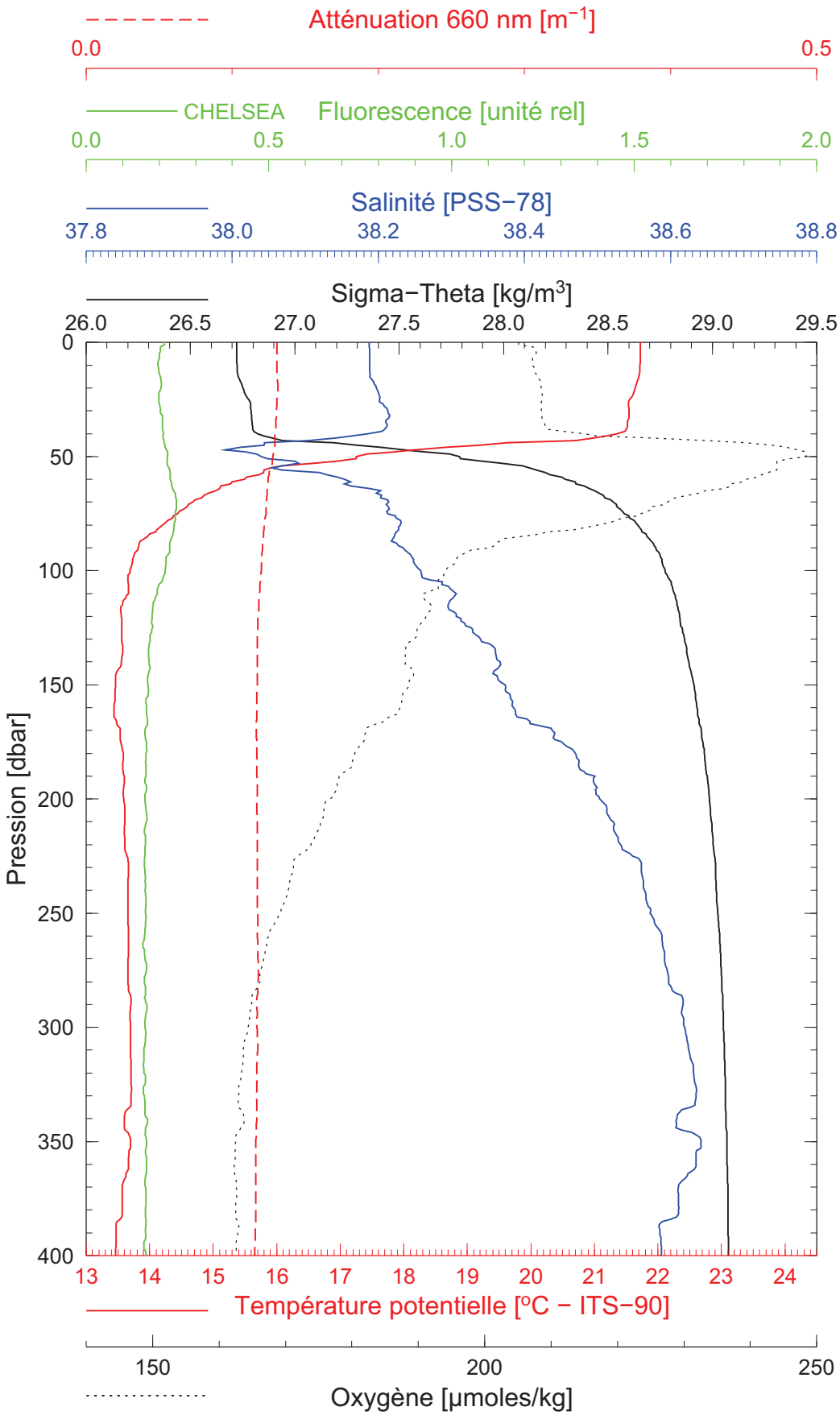


Date *25/10/2014* *Latitude* *43°29.054 N*

Heure déb *13h 09min [TU]* *Longitude* *07°41.929 E*

BOUSSOLE 152 **25/10/2014** **BOUS141025_05**

BOUS007

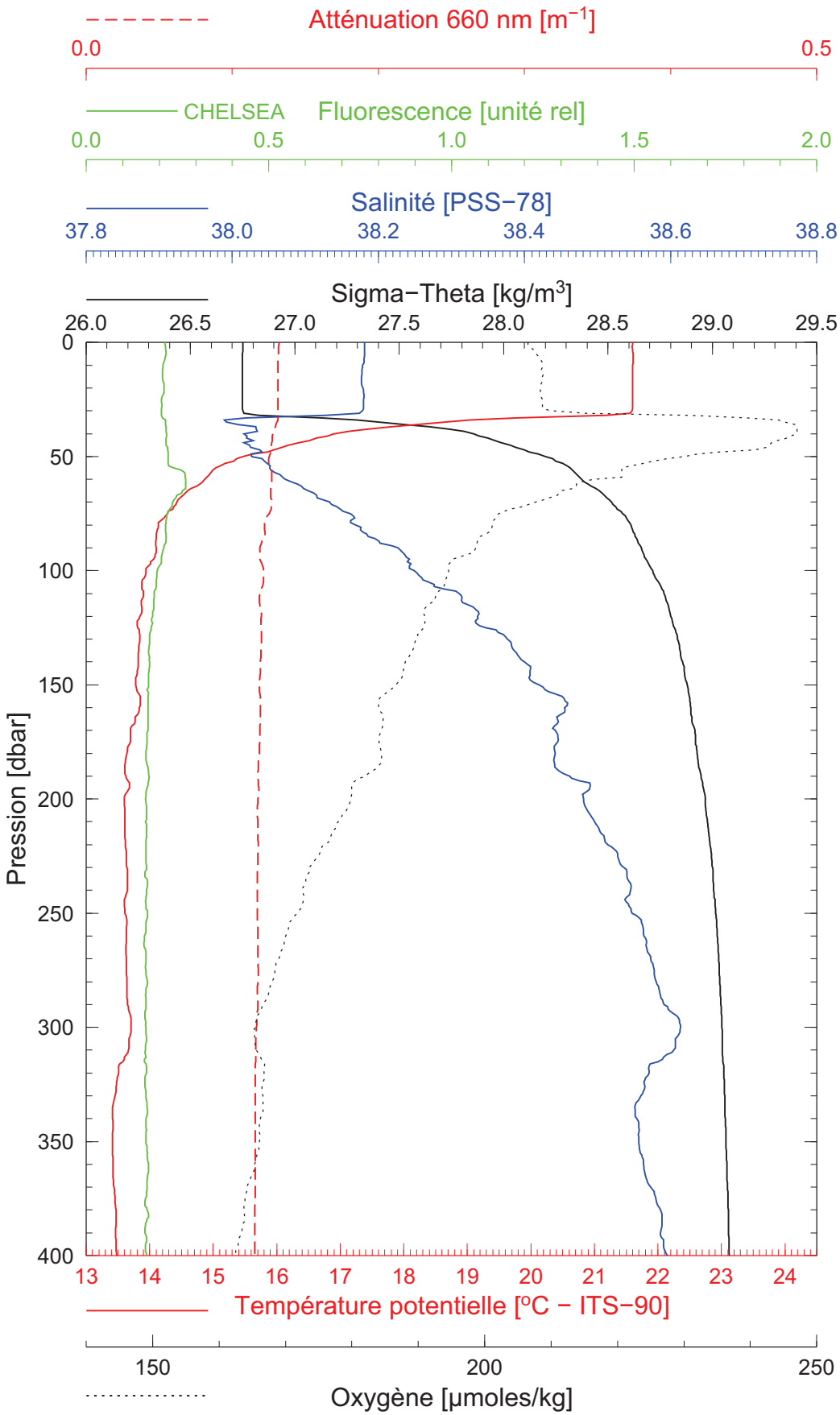


Date *25/10/2014* *Latitude* *43°31.001 N*

Heure déb *14h 11min [TU]* *Longitude* *07°36.954 E*

BOUSSOLE 152 **25/10/2014** **BOUS141025_06**

BOUS008



Date *25/10/2014* *Latitude* *43°34.036 N*

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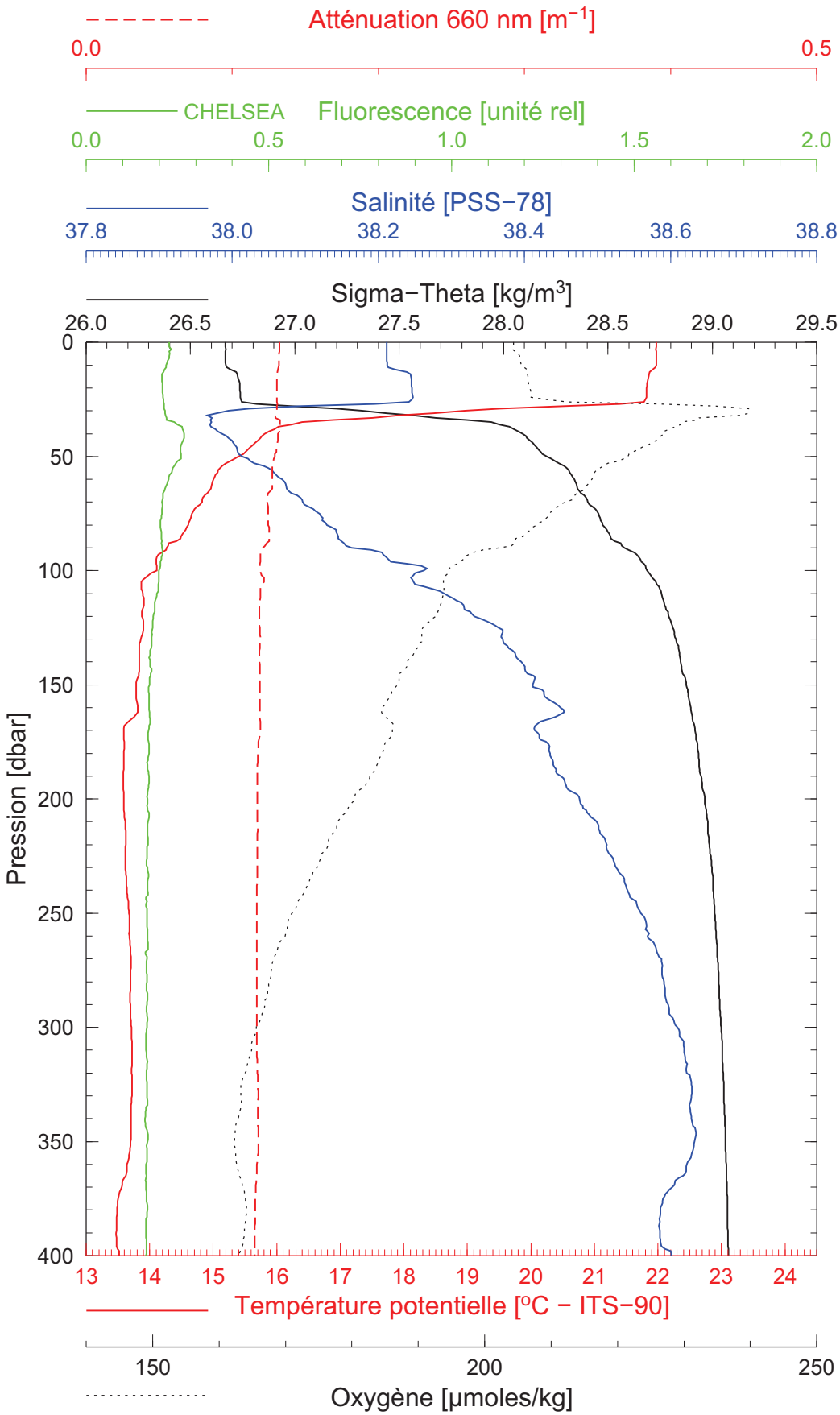
BOUSSOLE 152 **25/10/2014** **BOUS141025_07**

BOUS009

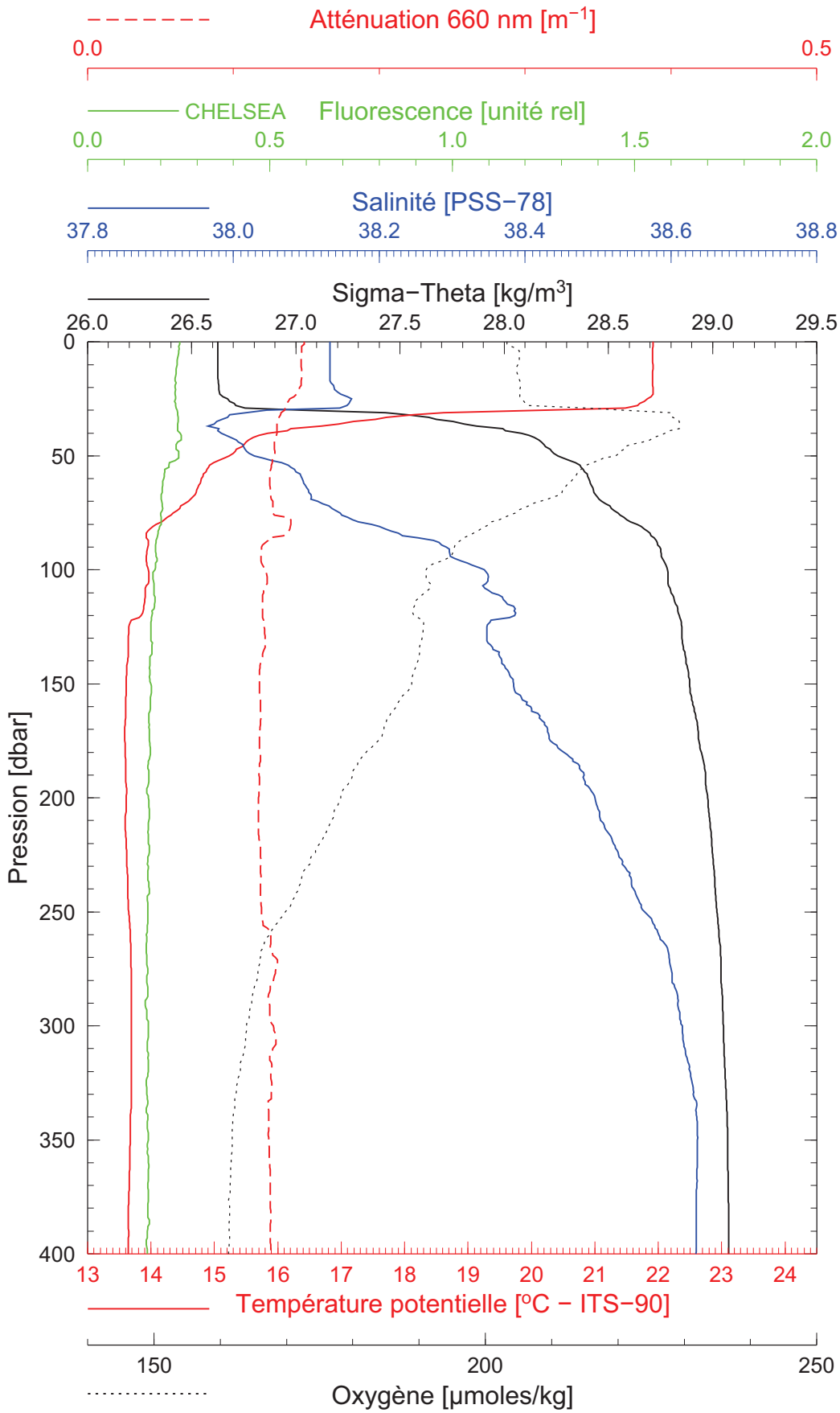


Date *25/10/2014* *Latitude* *43°36.979 N*

Heure déb *16h 09min [TU]* *Longitude* *07°24.948 E*

BOUSSOLE 152 **25/10/2014** **BOUS141025_08**

BOUS010



Date *25/10/2014* *Latitude* *43°39.052 N*

Heure déb *17h 05min [TU]* *Longitude* *07°21.064 E*