

BOUSSOLE Monthly Cruise Report

Cruise 138

August 23 – 24 – 27, 2013

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

Vessel: R/V Téthys II
(Captain: Renaud Le Bourhis)

Science Personnel: Marie Barbieux, Erin Cox, Emilie Diamond, Melek Golbol, David Luquet, Didier Robin and Vincent Taillandier.

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



Several pilot whales (*genus globicephala*) have been observed at the BOUSSOLE site after the diving operations.

BOUSSOLE project

ESA/ESRIN contract N° 13226/10/I-NB

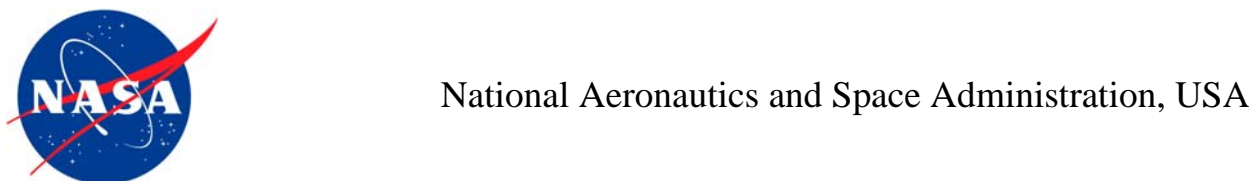
October 28, 2013



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 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).

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).

From 2013, the BOUSSOLE cruises are coupled with one day of operations by the DYFAMED program. This coupling aims at optimizing usage of ship time and human resources. So for one day of each cruise, there will be one deep CTD cast with water sampling for oxygen, alkalinity and nutrients analysis at the DYFAMED site and also two vertical plankton nets (0-100 m).

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 was used for diving operations and 1 CTD cast with water sampling at the BOUSSOLE site, optical profiles and 1 Secchi disk. The second day was used for 1 CTD cast with water sampling at the BOUSSOLE site and the CTD transect. The last day was used for 1 CTD cast with water sampling at the BOUSSOLE site, optical profiles and 1 Secchi disk.

Friday 23 August 2013

This day the sea state was smooth with a gentle breeze. The sky was blue and the visibility was good. When arrived at the BOUSSOLE site, divers went at sea to clean the underwater sensors and perform dark measurements. Then 1 CTD cast with water sampling, optical profiles and 1 Secchi disk were performed.

Saturday 24 August 2013

The second day, the sea state was smooth with a gentle breeze. The sky was cloudy and the visibility was good. 1 CTD cast with water sampling was performed at the BOUSSOLE site. Then the CTD transect was performed.

Tuesday 27 August 2013

The last day, the sea state was slight with a moderate breeze. The sky was blue and the visibility was good. When arrived at the BOUSSOLE site, 1 CTD cast with water sampling, optical profiles, 1 Secchi disk were performed at the BOUSSOLE site. Then 1 deep CTD cast with water sampling for the MOOSE cruise at the DYFAMED site was performed.

Cruise Report

Friday 23 August 2013 (UTC)

People on board: Marie Barbieux, Melek Golbol, Vincent Taillandier and 3 divers.

0530 Departure from the Nice harbour.
0905 Arrival at the BOUSSOLE site.
0920 Diving on the buoy for cleaning instruments, dark measurements and maintenance of the buoy.
0930 Cleaning of connections and solar panel at the top of the buoy.
1000 Direct connection with the buoy and data retrieval.
1110 CTD 01, 400 m with water sampling at 400, 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p , TSM, POC and Cytometry.
1145 Secchi disk 01 (23 m).
1220 C-OPS 01, 02, 03,04.
1320 Departure to the Nice harbour.
1630 Arrival at the Nice harbour.

Saturday 24 August 2013 (UTC)

People on board: Marie Barbieux, Melek Golbol and Vincent Taillandier.

0415 Departure from the Nice harbour.
0740 Arrival at the BOUSSOLE site.
0750 CTD: problems with the communication of the carousel of the Rosette
0805 CTD 02, 400 m, with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p , TSM.
0840 C-OPS: sky cloudy and unstable: no optical profiles.
0845 Departure to the first transect station.
0920 CTD 03, 400 m, station 01 (43°25'N 07°48'E).
1020 CTD 04, 400 m, station 02 (43°28'N 07°42'E).
1120 CTD 05, 400 m, station 03 (43°31'N 07°37'E).
1225 CTD 06, 400 m, station 04 (43°34'N 07°31'E).
1330 CTD 07, 400 m, station 05 (43°37'N 07°25'E).
1430 CTD 08, 400 m, station 06 (43°39'N 07°21'E).
Dark HS6, 200m.
1500 Departure to the Nice harbour.
1530 Arrival at the Nice harbour.

Tuesday 27 August (UTC)

People on board: Marie Barbieux, Emilie Diamond and Melek Golbol.

0505 Departure from the Nice harbour.
0820 Arrival at the BOUSSOLE site.
0830 CTD 09, 400 m, with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p , TSM.
0920 C-OPS 05, 06, 07.
1000 Secchi disk 02 (27 m).
1005 Departure to the DYFAMED site.
1025 Arrival at the DYFAMED site.
1030 CTD MOOSE 66, 2400m with water sampling.

1210 Departure to the Nice harbour.
1500 Arrival at the Nice harbour.

Problems identified during the cruise

- The first day was programmed the 22nd of August but this day was replaced with the 27th of August because of a technical problem on the Téthys-II. The boat was prevented to leave La Seyne-sur-mer for the entire day (22nd).
- The second day, there was a communication problem with the Rosette carousel. The closing of the Niskin bottles was performed manually from the deck unit. The socket serial card linking the computer with the deck unit was deficient. At this time, it was replaced with a USB serial adapter but the driver was lacking. This problem was solved the next day by changing the socket serial card.
- The second day, the sky was cloudy and too unstable for performing optical profiles.

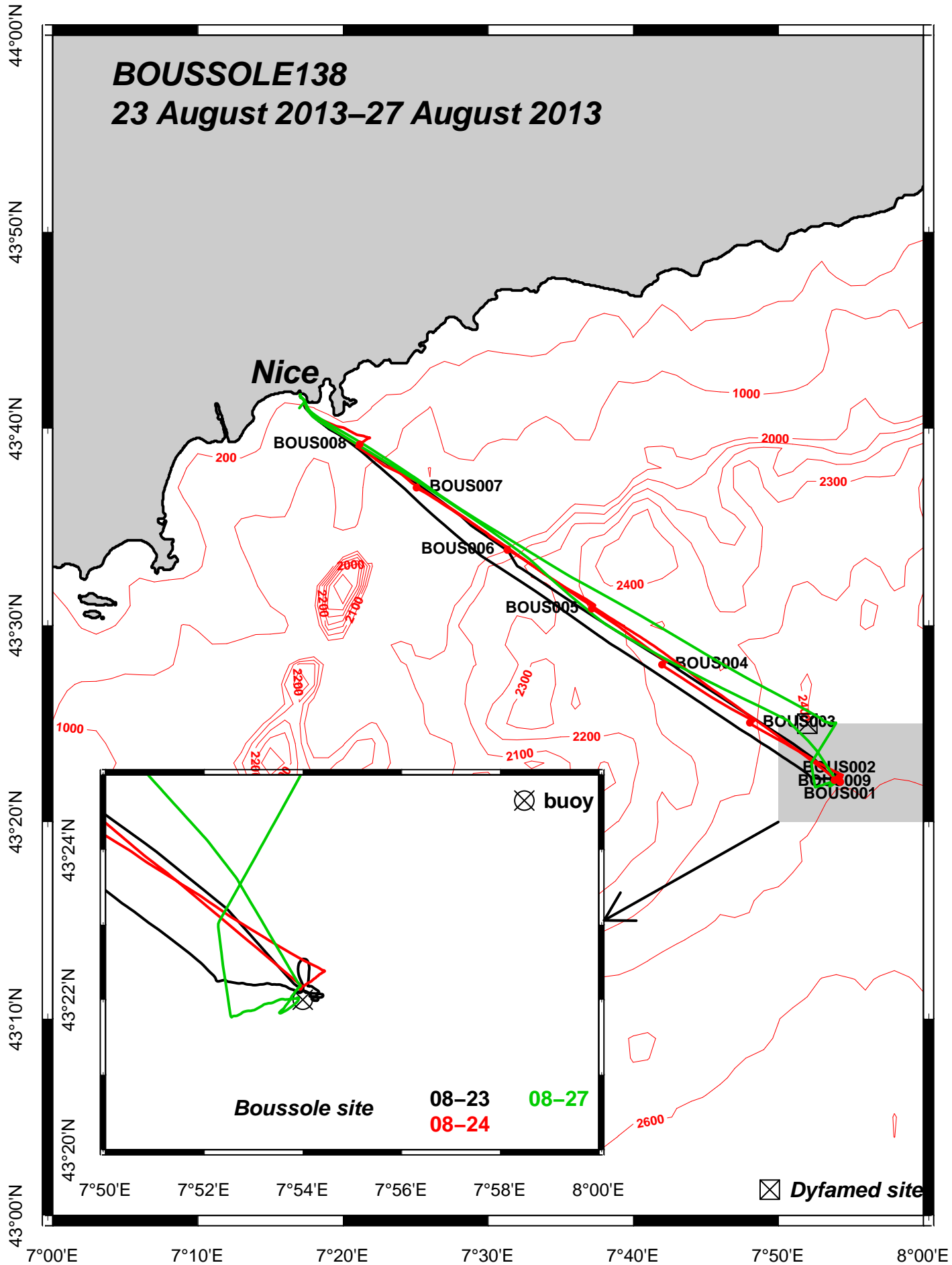
Appendices

Cruise Summary Table for Boussole 138

Date	Black names (file ext: ".raw")	Profile names (file extension: ".raw")	CTD notées / satellite overpass	Other sensors	Start Time GMT (hour.min)	Duration (min.sec)	Depth max (meter)	Latitude (N)			longitude			Sky	Clouds	Quantity (#/8)	Weather		Atm. Pressure (hPa)	Humidity (%)	Visibility	T air	T water	Sea	Sea Swell H (m)	Swell dir.	Whitecaps	
								(Degree)	(Minute)	(Degree)	(Degree)	(Minute)	Wind sp. (kn)				Wind dir.											
23/08/13			CTDBOUS001	HPLC, Ap, TSM, CDOM, POC & cyto Secchi01	11:10	33:00	400	43	22.040	7	54.270	blue			0	7	109	1015.4	69	good	25.0	24.6	calm					
		bou_c-ops_130823_1203_001_data.csv			11:45	4:00	23	43	22	7	54	blue			0													
			bou_c-ops_130823_1203_002_data.csv			12:08	1:23																					
			bou_c-ops_130823_1203_003_data.csv			12:25	3:50	92.3	43	22.194	7	53.568	blue	CI		1	10	288	1015.3	63	good	24.7		calm	0.3			few
			bou_c-ops_130823_1203_004_data.csv			12:35	3:35	87.6	43	22.203	7	53.381	blue	CI		1	10	288	1015.3	63	good	24.7		calm	0.3			few
			bou_c-ops_130823_1203_005_data.csv			13:07	3:58	97.5	43	22.241	7	52.500	blue	CI		1	10	288	1015.3	63	good	24.7		calm	0.3			few
		bou_c-ops_130823_1203_006_data.csv			13:33	2:20																						
24/08/13			CTDBOUS002	HPLC, Ap, TSM	8:05	31:00	400	43	22.255	7	54.191	cloudy			4	11	266	1014.3	82		23.9	24.5	calm					
			CTDBOUS003		9:24	22:00	400	43	25.048	7	48.045	cloudy			4	16	104	1014.2	79		24.2	24.5	calm					
			CTDBOUS004		10:24	23:00	400	43	23.002	7	41.992	cloudy			4	14	126	1013.6	77		24.3	24.5	calm					
			CTDBOUS005		11:22	26:00	400	43	30.847	7	37.152	cloudy			4	14	260	1013.0	78		23.8	24.7	calm					
			CTDBOUS006		12:26	25:00	400	43	33.832	7	31.336	cloudy			4	14	255	1012.2	81		24.0	24.6	calm					
			CTDBOUS007		13:30	26:00	400	43	36.988	7	25.075	overcast			8	15	261	1011.9	80		24.4	25.5	calm					
		CTDBOUS008		14:31	25:00	400	43	39.200	7	21.156	overcast			8	16	145	1010.9	82		24.2	24.8	calm						
27/08/13			CTDBOUS009		08:33	33:00	400	43	22.132	7	53.877	blue			3	11.5	266	1011.0	72		22.5	23.9	calm					
		bou_c-ops_130827_0756_001_data.csv			08:00	1:21																						
			bou_c-ops_130827_0756_002_data.csv			09:22	3:26	81.5	43	22.004	7	53.671	blue	CI		3	10.3	158	1011.0	71	good	22.8		calm	0.7			yes
			bou_c-ops_130827_0756_003_data.csv			09:32	3:20	80.5	43	21.964	7	53.400	blue	CI		3	10.3	158	1011.0	71	good	22.8		calm	0.7			yes
			bou_c-ops_130827_0756_004_data.csv			09:44	3:23	81.6	43	21.865	7	53.024	blue	CI		3	10.3	158	1011.0	71	good	22.8		calm	0.7			yes
			bou_c-ops_130715_1053_005_data.csv			10:33	3:59																					
					10:00	4:00	27	43	22	7	54	blue			3						good			calm				

BOUSSOLE138

23 August 2013–27 August 2013



Boussole site

08-23
08-24

08-27

⊗ *Dyfamed site*

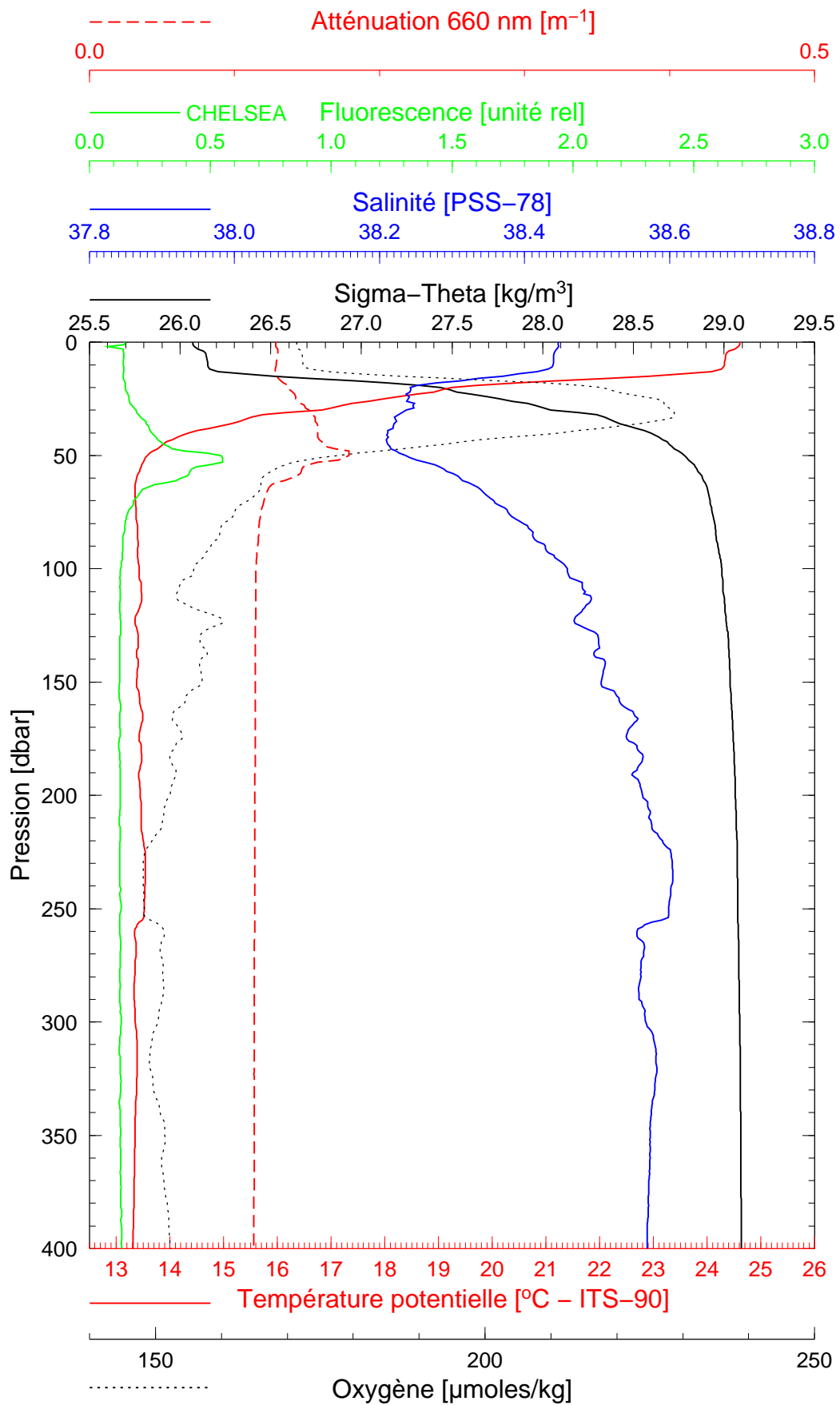
⊗ buoy

BOUSSOLE 138

23/08/2013

BOUS130823_01

BOUS001



Date 23/08/2013
Heure déb 11h 10min [TU]

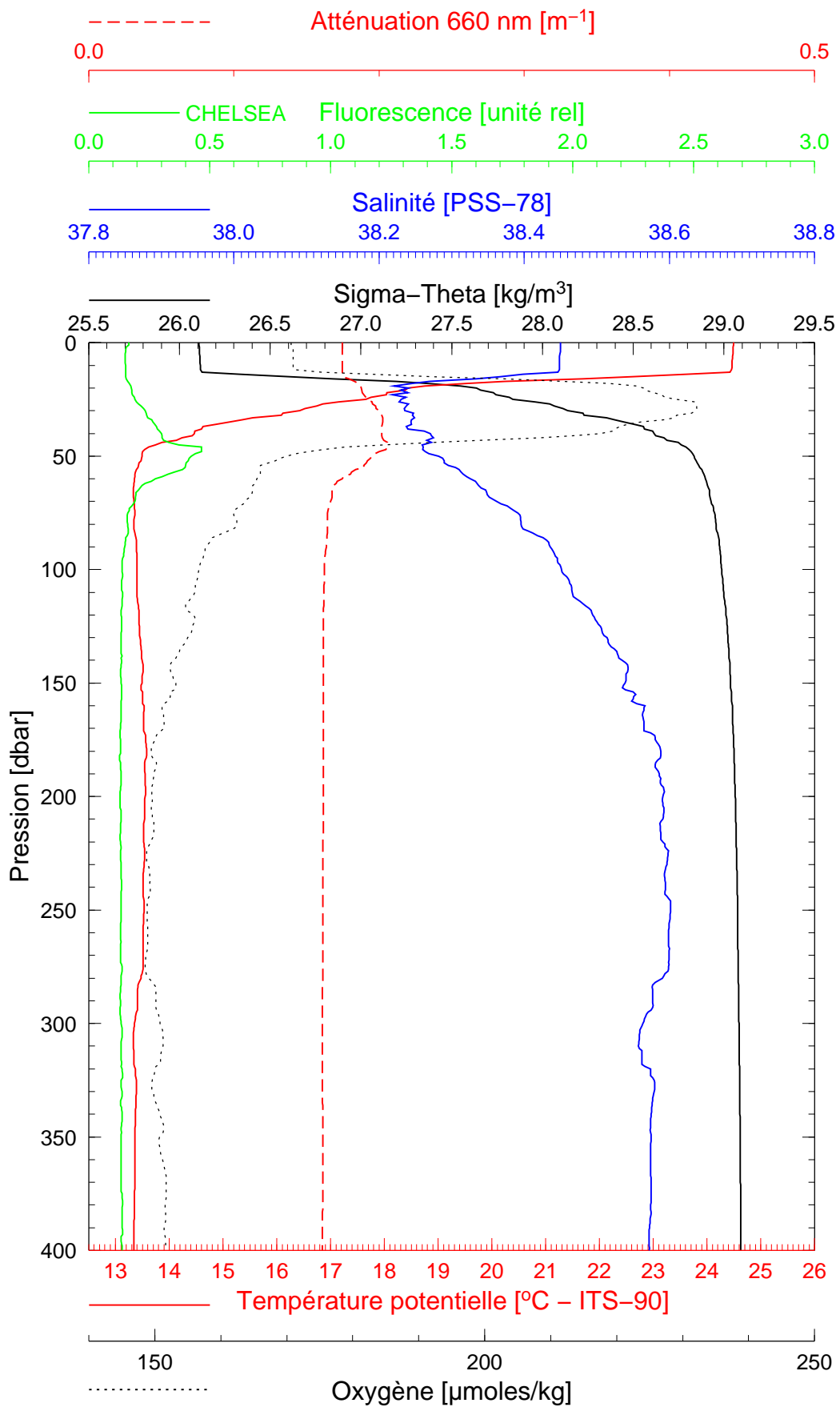
Latitude 43°22.040 N
Longitude 07°54.270 E

BOUSSOLE 138

24/08/2013

BOUS130824_01

BOUS002



Date 24/08/2013
Heure déb 08h 05min [TU]

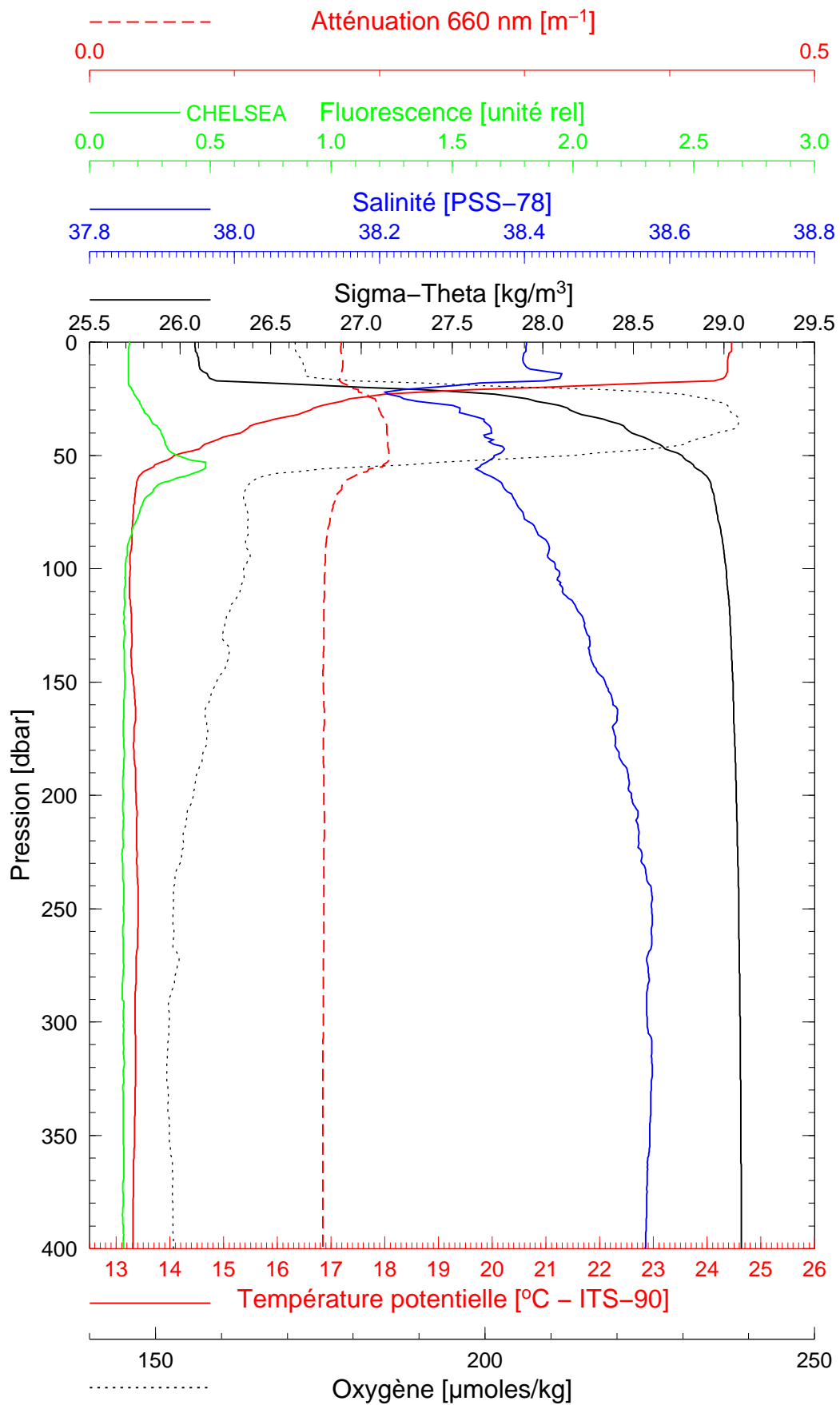
Latitude 43°22.255 N
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BOUSSOLE 138

24/08/2013

BOUS130824_02

BOUS003



Date 24/08/2013
Heure déb 09h 24min [TU]

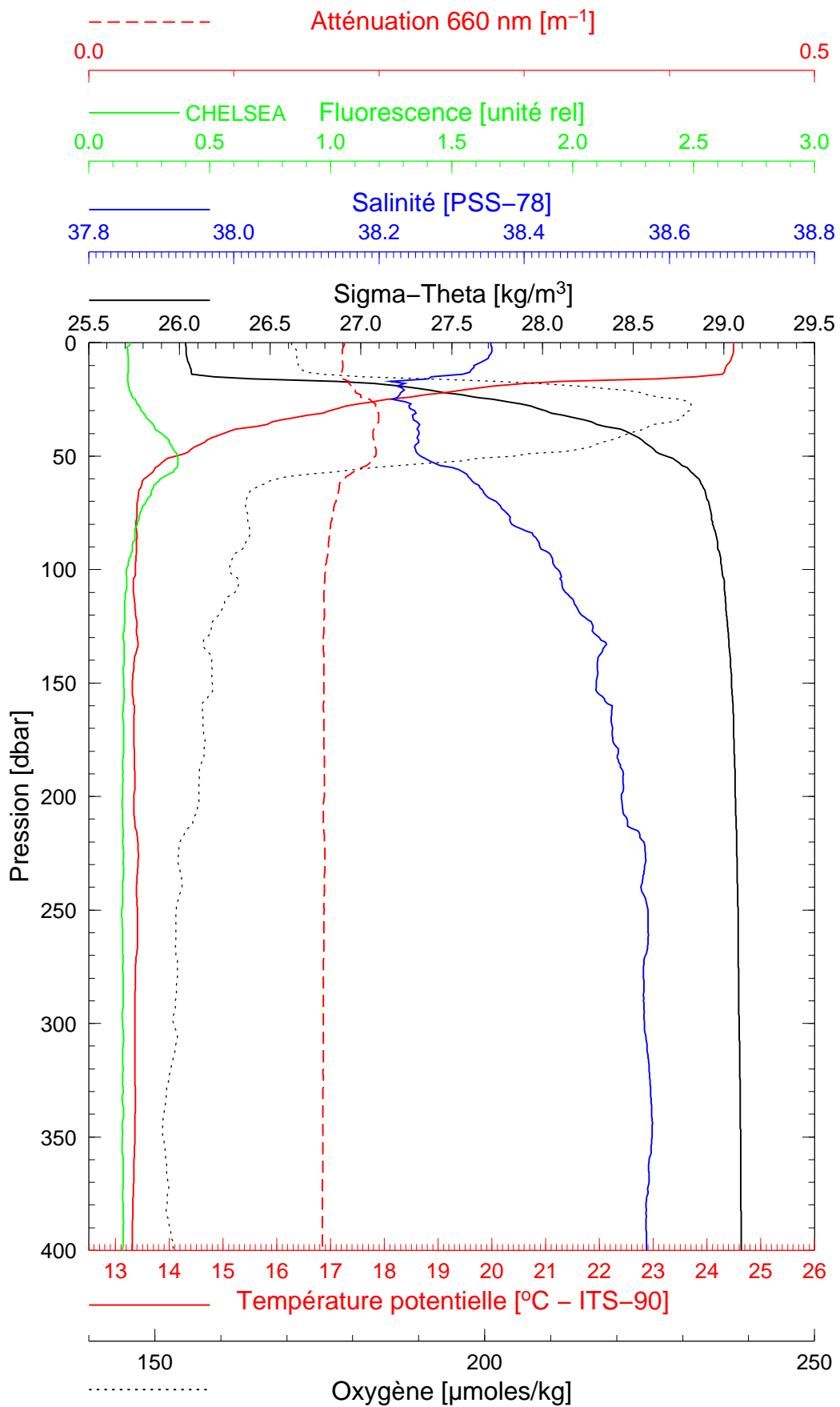
Latitude 43°25.048 N
Longitude 07°48.045 E

BOUSSOLE 138

24/08/2013

BOUS130824_03

BOUS004



Date 24/08/2013
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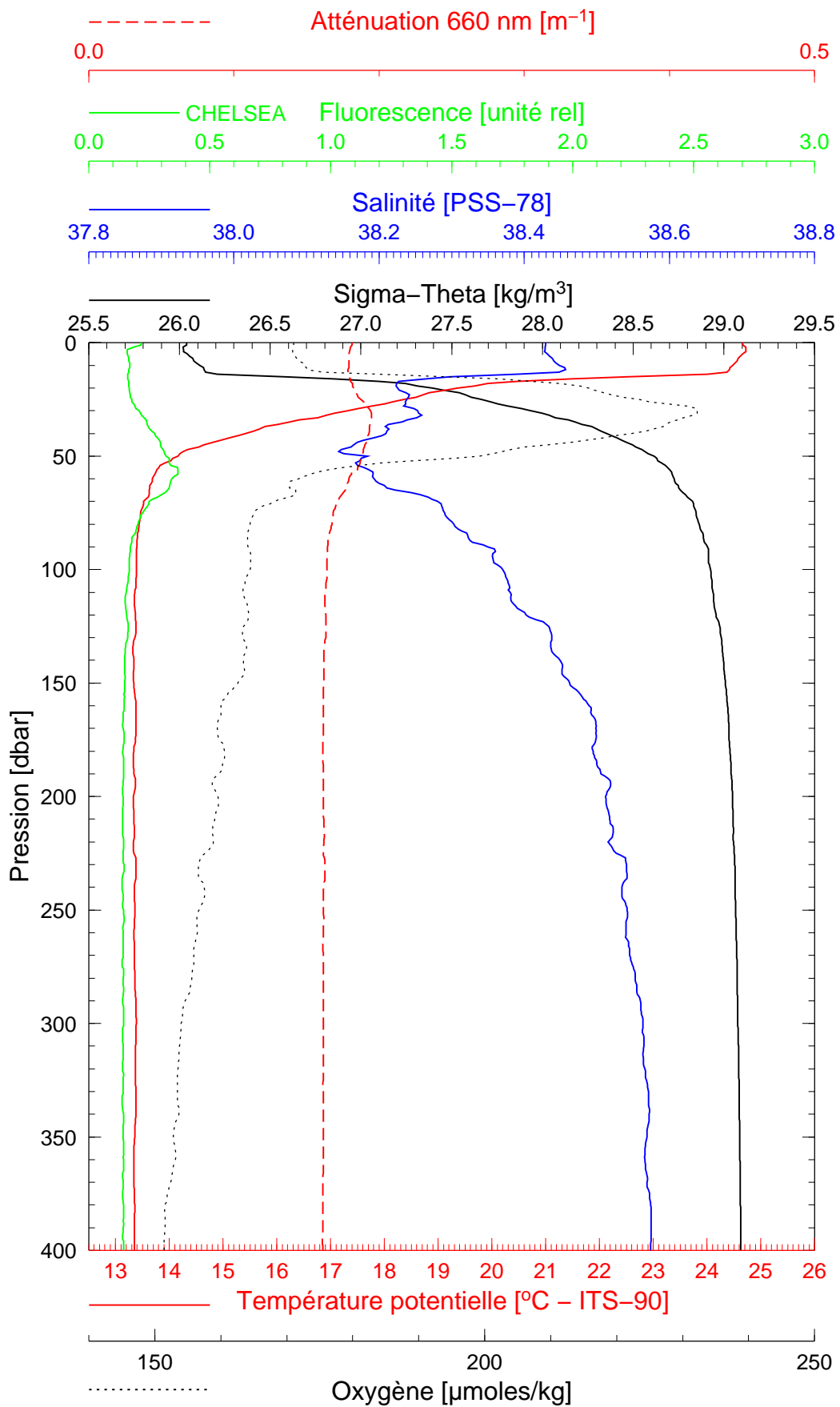
Latitude 43°28.002 N
Longitude 07°41.992 E

BOUSSOLE 138

24/08/2013

BOUS130824_04

BOUS005



Date 24/08/2013
Heure déb 11h 22min [TU]

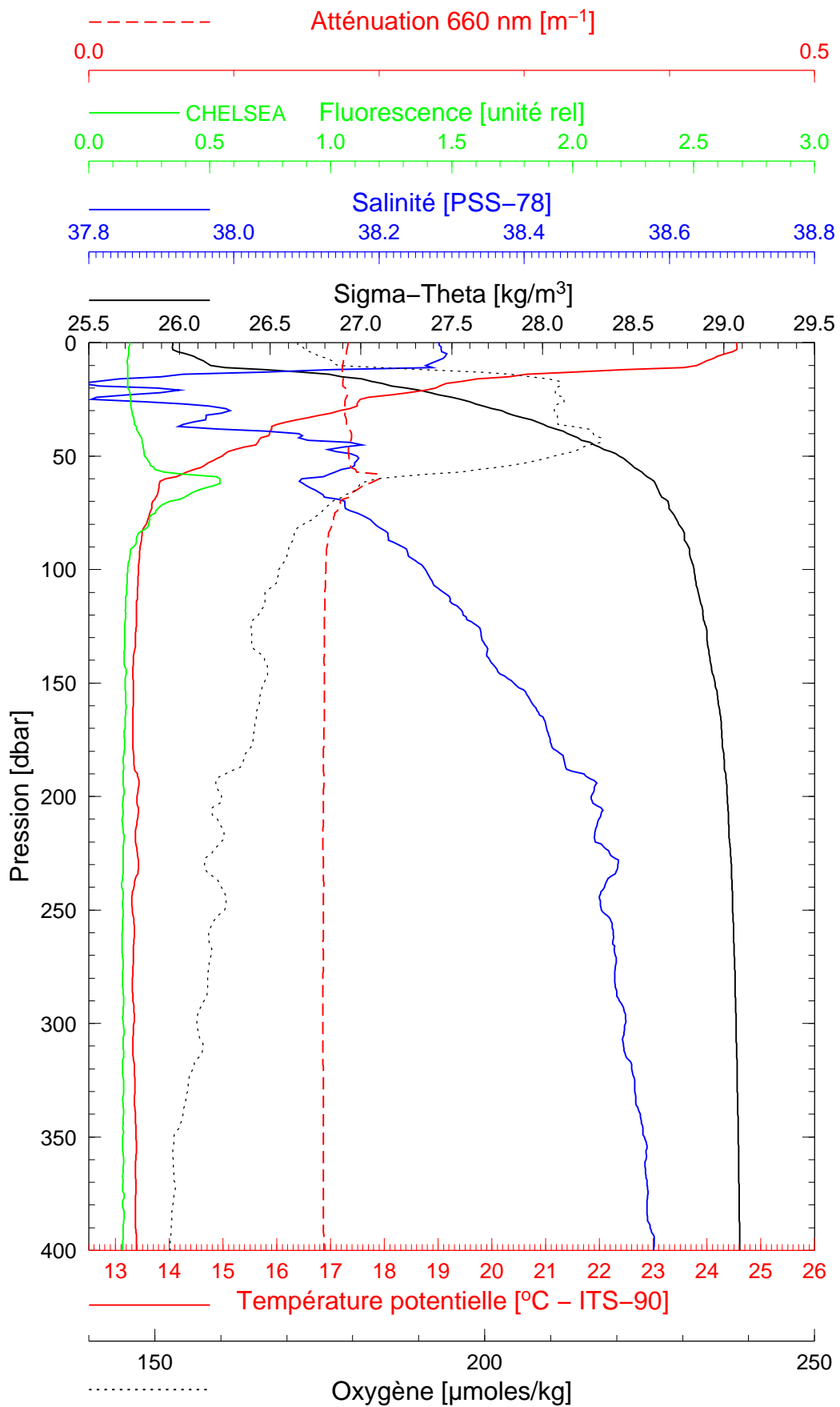
Latitude 43°30.847 N
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BOUSSOLE 138

24/08/2013

BOUS130824_05

BOUS006



Date 24/08/2013
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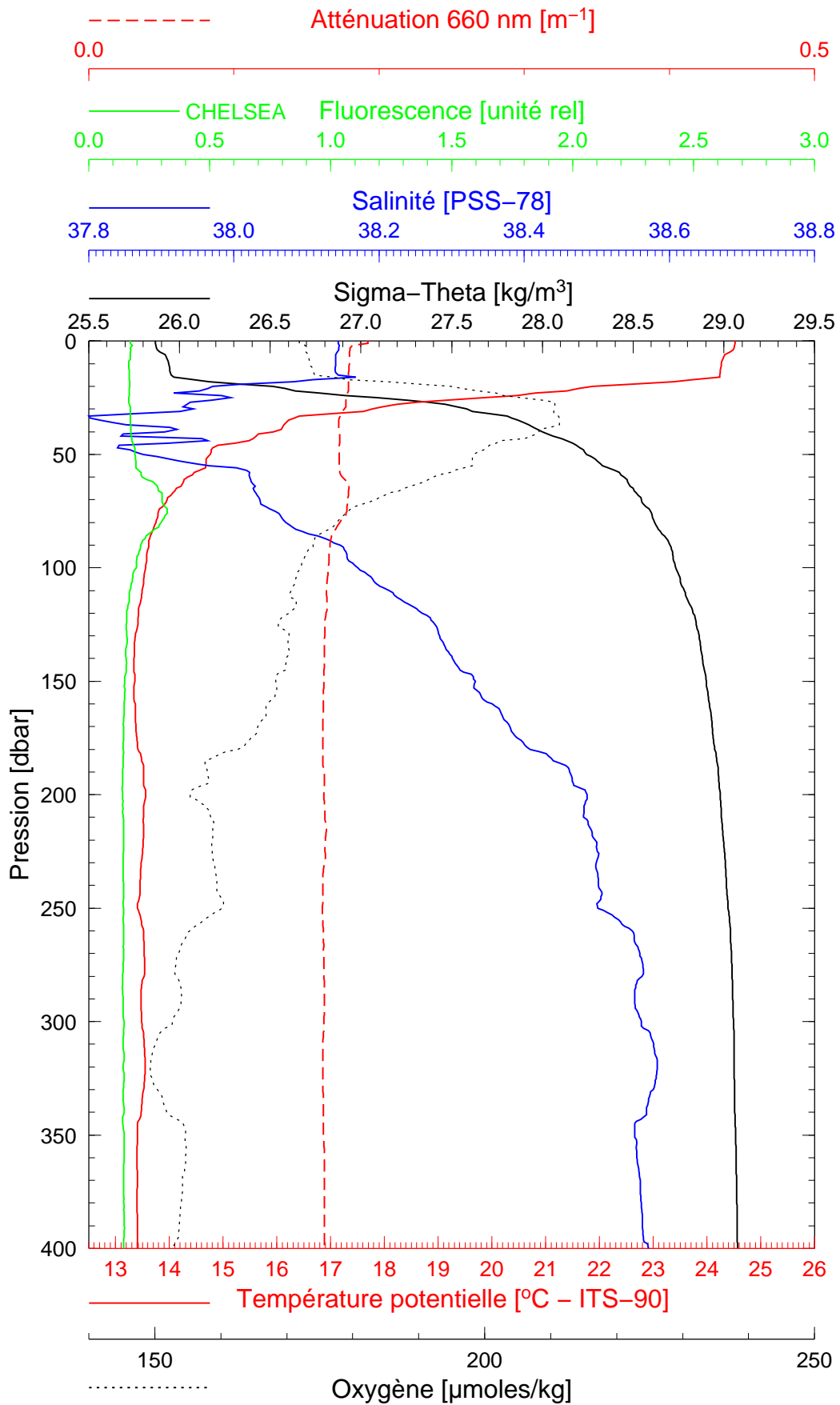
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BOUSSOLE 138

24/08/2013

BOUS130824_06

BOUS007



Date 24/08/2013
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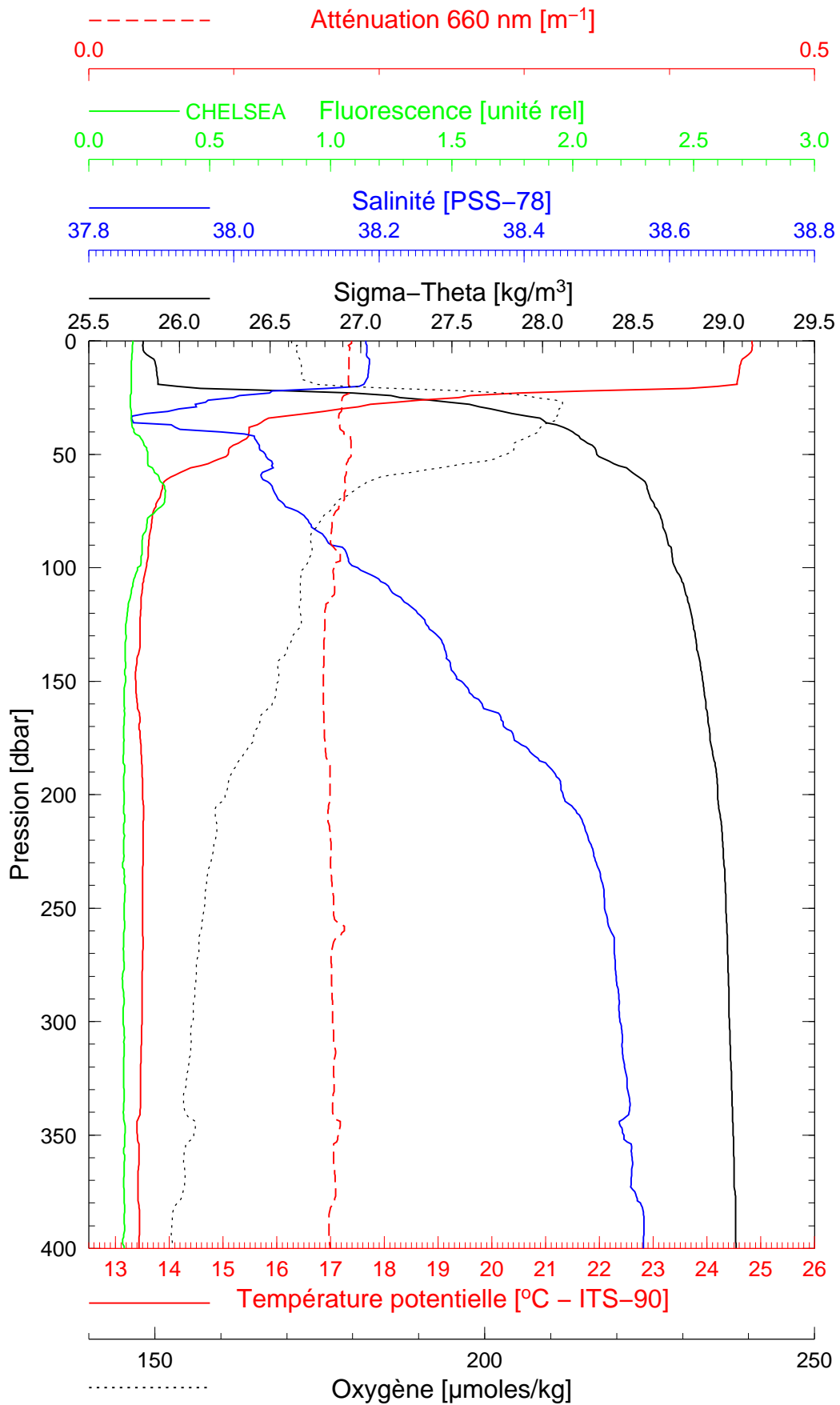
Latitude 43°36.998 N
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BOUSSOLE 138

24/08/2013

BOUS130824_07

BOUS008



Date 24/08/2013
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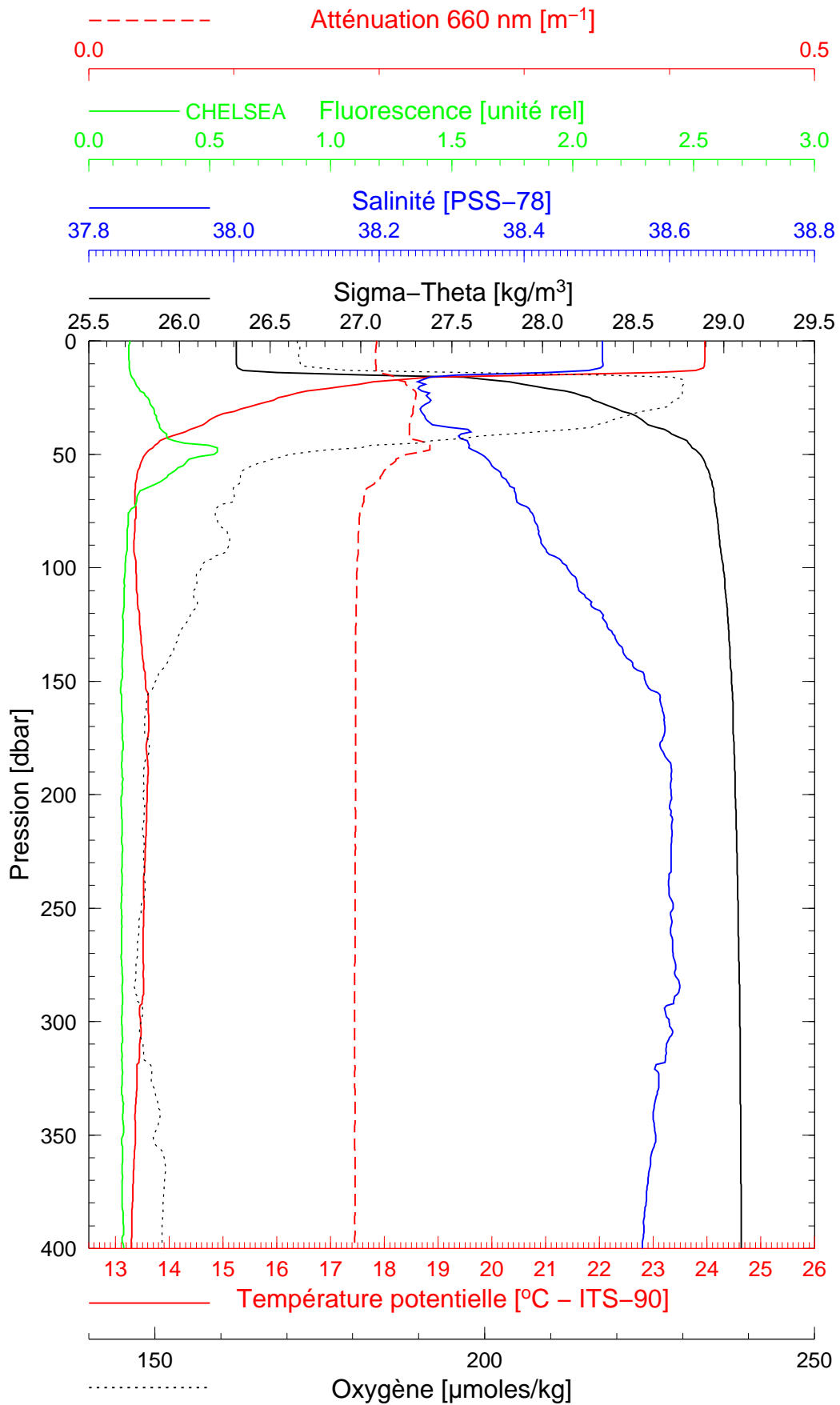
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Longitude 07°21.156 E

BOUSSOLE 138

27/08/2013

BOUS130827_01

BOUS009



Date 27/08/2013
Heure déb 08h 33min [TU]

Latitude 43°22.132 N
Longitude 07°53.877 E