

The BOUSSOLE project technical reports; report # 10-102, issue 1.

BOUSSOLE Monthly Cruise Report

Cruise 119

January 25 - 28, 2012

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Vessel: R/V Antéa / IRD

(Captain: Roger Stephan)

Science Personnel: Emilie Diamond, Yves Lamblard, David Luquet, Grigor Obolensky and Vincenzo Vellucci.

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The R/V Antéa nearby the BOUSSOLE buoy.

BOUSSOLE project

ESA/ESRIN contract N° 13226/10/I-NB

February 13, 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

CENTRE NATIONAL D'ÉTUDES SPATIALES



National Aeronautics and Space Administration, USA



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 to occur on 0-150 m at the BOUSSOLE site within about 3 hours of satellite overhead passes (of MERIS in particular) 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. In addition to the depth profile from the CTD, CDOM fluorometer, Chl fluorometer, AC9 (from July 2002) and Eco-BB3 (from June 2003), seawater samples are to be collected, filtered and stored into liquid nitrogen for 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. From December 2011, hyperspectral absorption measurements are to be performed during the CTD deployments using a new "IOP package" including a Hobilabs hyperspectral absorption-meter (a-sphere), a backscattering meter (Hydroscat-6) and a spectral transmissometer (Gamma-4).

For one day of each cruise, in addition to a depth profile from the CTD, seawater samples are to be collected and filtered for colored dissolved organic matter (from June 2005) and particulate organic carbon (from October 2011) analysis in the lab. Small quantities of seawater are to be fixed with glutaraldehyde for cytometric analysis (from December 2011).

For one day of each cruise, at the end of the optics measurements on site, there will be one CTD transect between the BOUSSOLE site and the Port of Nice. This transect consists of six fixed locations on-route from BOUSSOLE (see map in appendix). The time of the day of this transect should be similar for each cruise, if possible to minimise the influence of diurnal variability.

For one day of each cruise, three divers will check the underwater state of the buoy structure and instrumentation, take some pictures for archiving, clean the sensor optical surfaces, and then take again some pictures after cleaning. Divers will also put a neoprene cap on the HS4 and on the transmissometers for acquiring three 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

A set of 6 CTD casts with water sampling for HPLC, a_p , a_{phi} , POC, TSM and cytometry measurements has been performed at the BOUSSOLE site during 24 hours to observe the possible diurnal variability of those parameters.

Cruise Summary

The three first days were used for optical profiles and CTD casts with water sampling. We spent the first night at the BOUSSOLE site for performing 1 CTD cast in the evening and 1 early in the morning. The second day was also used for performing the CTD transect. The third day weather conditions were not optimal and prevented diving operations at the BOUSSOLE site. The last day, the bad weather prevented the departure from the Nice harbour.

Wednesday 25 January 2012

The first day, the sea was slightly roughened with a gentle breeze and the sky was blue with a good visibility. When arrived at the BOUSSOLE site, 3 CTD casts with water sampling and 3 C-OPS profiles were performed.

The last CTD cast was performed in the evening and we staid throughout the night in the vicinity of the BOUSSOLE buoy.

Thursday 26 January 2012

The second day, the sea was smooth with a light air and the sky was overcast. A first CTD cast with water sampling was performed early in the morning. After, a direct connection with the buoy was established for data retrieval and the CISCO and ARGOS connections, the solar panels and the sensors on the top of the buoy were cleaned. Then 2 other CTD casts with water sampling, 3 C-OPS profiles and 1 Secchi disk were performed before performing the CTD transect.

Friday 27 January 2012

The third day, the weather conditions were not as optimal as expected. The sea was moderate with a fresh to strong breeze and the sky was overcast. When on site, the sea state prevented the diving operations on the BOUSSOLE buoy. However, 1 CTD cast with water sampling, 3 C-OPS profiles and 1 Secchi disk were performed.

Saturday 28 January 2012

Bad weather prevented departure from the Nice harbour.

Cruise Report

Wednesday 25 January 2012 (UTC)

People on board: Emilie Diamond and Grigor Obolensky.

0700 Departure from the Nice harbour.
1020 Arrival at the BOUSSOLE site.
1030 Setting up the moon pool for the CTD cast.
1115 CTD 01, 400 m with water sampling at 200, 150, 80, 70, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p and TSM.
1220 C-OPS balance tests.
1330 C-OPS 01, 02, 03.
1505 CTD 02, 400 m with water sampling at 30, 20, 10 and 5 m for HPLC, a_p , a_{phi} , POC and cytometry.
1805 CTD 03, 400 m with water sampling at 43, 20, 10 and 5 m for HPLC, a_p , a_{phi} , POC and cytometry.
2015 CTD cable unrolled and wound up.

Thursday 26 January 2012 (UTC)

People on board: Emilie Diamond and Grigor Obolensky.

0620 CTD 04, 400 m with water sampling at 30, 20, 10 and 5 m for HPLC, a_p , a_{phi} , POC and cytometry.
0740 Cleaning of solar panels, CISCO and ARGOS connections and sensors on the top of the buoy.
0800 Direct connection with buoy and data retrieval.
0905 CTD 05, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p and TSM.
1000 C-OPS 04, 05, 06.
1120 CTD 06, 400 m with water sampling at 400, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p , POC, CDOM and cytometry.
1200 Secchi disk 01 (16 m).
1205 Departure to the first transect station.
1320 CTD 07, 400 m, station 01 (43°25'N 07°48'E).
1430 CTD 08, 400 m, station 02 (43°28'N 07°42'E).
1550 CTD 09, 400 m, station 03 (43°31'N 07°37'E).
1700 CTD 10, 400 m, station 04 (43°34'N 07°31'E).
1815 CTD 11, 400 m, station 05 (43°37'N 07°25'E).
1915 CTD 12, 400 m, station 06 (43°39'N 07°21'E).
1950 Departure to the Nice harbour.
2025 Arrival at the Nice harbour.

Friday 27 January 2012 (UTC)

People on board: Emilie Diamond, Grigor Obolensky, Vincenzo Vellucci and 2 divers.

0630 Departure from the Nice harbour.

0955 Arrival at the BOUSSOLE site: weather conditions not optimal.

1040 CTD 13, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p and TSM.

1130 Filtrations.

1215 C-OPS 07, 08, 09.

1320 Secchi disk 02 (12 m).

1330 Departure to the Nice harbour.

1655 Arrival at the Nice harbour.

Saturday 28 January 2012

Bad weather prevented departure from the Nice harbour.

Problems identified during the cruise

- The third day, weather conditions were not optimal and prevented the diving operations on the BOUSSOLE buoy.
- The last day, the bad weather prevented the departure from the Nice harbour.
- Data from the CDOM fluorometer were apparently corrupted.
- The Chelsea transmissometer was not on the CTD rosette during this cruise (on calibration).

Calculated Swath paths for the MERIS Sensor (Esov NG Software)

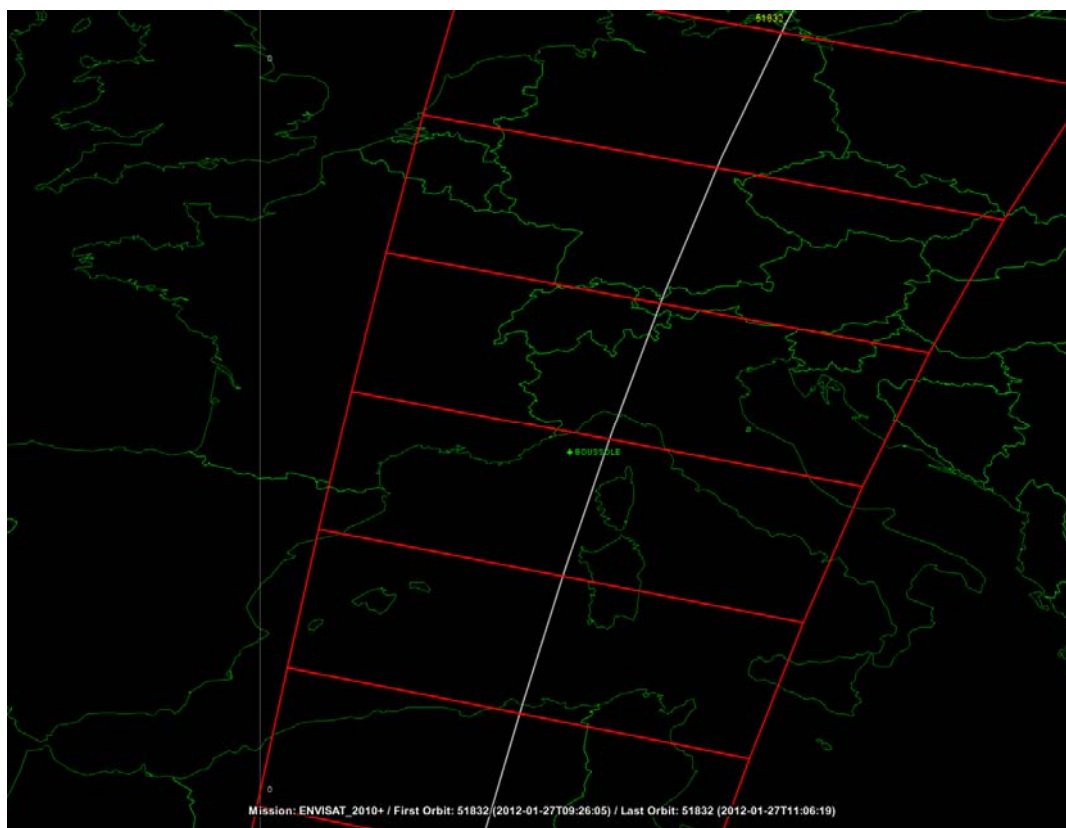


Figure 1. Calculated swath path for MERIS (Esov NG software) above the BOUSSOLE site for the 27th of January 2012.

Appendices

Cruise Summary Table for Boussole 119

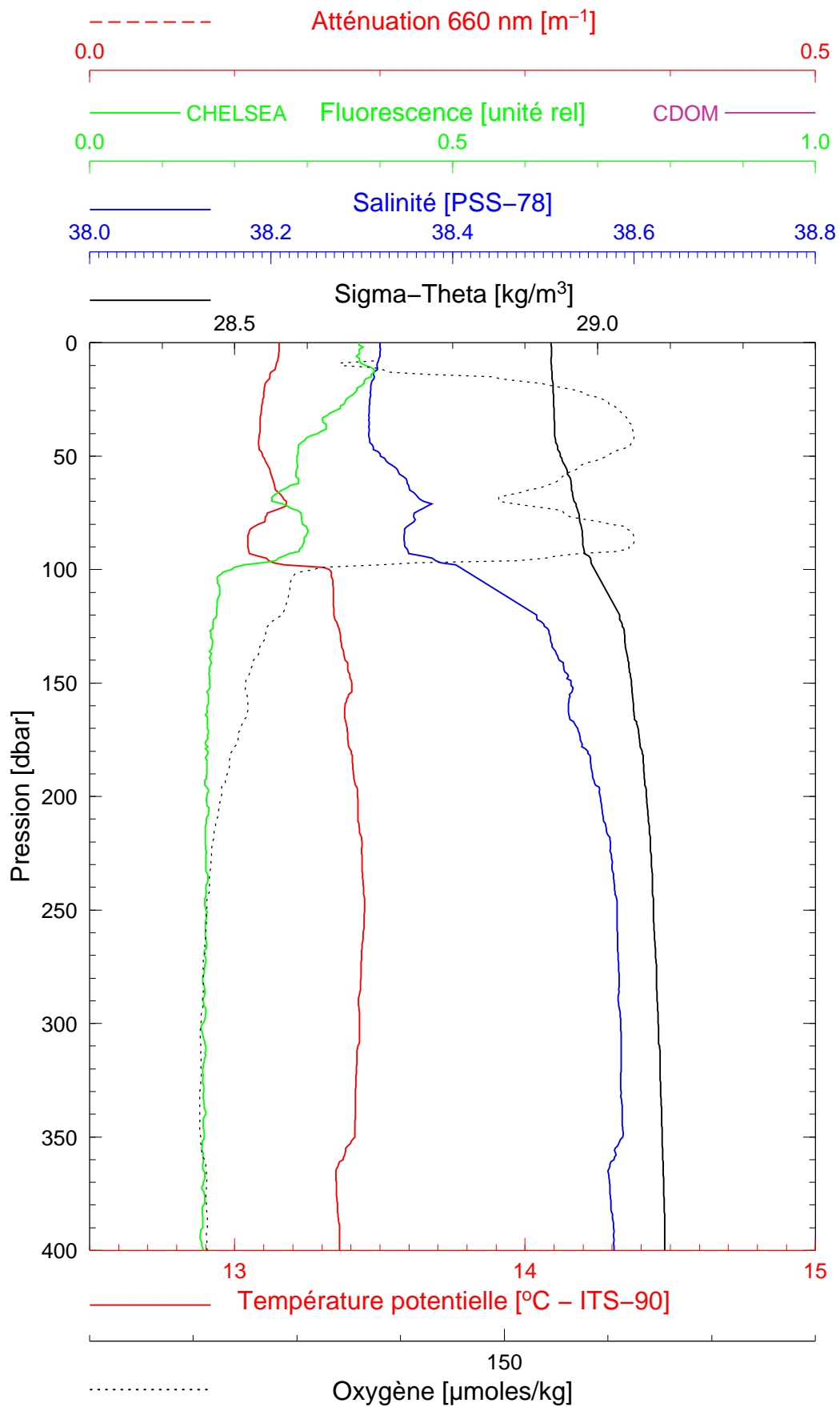
Date	Black names (file ext: ".raw")	Profile names (file extension: ".raw")	CTD notes / satellite overpass	Other sensors	Start Time		Depth max (meter)	Latitude (N)			Longitude		Sky	Clouds	Quantity (#/8)	Weather		Atm. Pressure (hPa)	Humidity (%)	Visibility	T air	T water	Sea	Sea Swell H (m)	Swell dir.	Whitecaps					
					GMT (hour.min)	(min.sec)		(Degree)	(Minute)	(Degree)	(Minute)	Wind sp. (kn)				Wind dir.															
25/01/12	bou c-ops 120125	1122_001_data.csv	CTDBOUS001	HPLC, Ap & TSM	11:15	40:00	400	43	22.060	7	53.422	blue		1	12	93	1018.4	42		13.1	13.2	calm			no						
		bou c-ops 120125 1122_004_data.csv			11:32	1:41																									
		bou c-ops 120125 1122_005_data.csv				13:49	3:49	85.6	43	21.581	7	53.476	blue	Ci	3	8	114	1017.9	45	good	12.9		calm	1.0		no					
		bou c-ops 120125 1122_006_data.csv				14:02	3:27	76.8	43	21.363	7	53.268	blue	Ci	3	8	114	1017.9	45	good	12.9		calm	1.0		no					
		bou c-ops 120125 1122_007_data.csv				14:12	4:03	89.1	43	21.251	7	53.139	blue	Ci	3	8	114	1017.9	45	good	12.9		calm	1.0		no					
				CTDBOUS002	HPLC, Ap, Aphii, POC & cyto	14:38	3:05																								
			CTDBOUS003	HPLC, Ap, Aphii, POC & cyto	15:08	41:00	400	43	21.737	7	53.876	blue		4	6	117	1017.8	46		12.2	13.2	calm			no						
					18:06	33:00	400	43	21.675	7	53.782	night		2	9	112	1018	50		11.5	13.2	calm			no						
26/01/12			CTDBOUS004	HPLC, Ap, Aphii, POC & cyto	06:30	38:00	400	43	22.081	7	53.389	night		7	4	171	1018	59		11.4	13.0	calm			no						
			CTDBOUS005	HPLC, Ap & TSM	09:06	34:00	400	43	22.147	7	54.847	overcast		8	2	232	1019	70		11.8	13.1	calm			no						
	bou c-ops 120126	1010_001_data.csv			10:13	1:18																									
		bou c-ops 120126 1010_002_data.csv				10:22	4:42	89.1	43	22.090	7	53.840	overcast	Ns&Cb	8	1	270	1019.2	62	medium	12.0		calm	0.3		no					
		bou c-ops 120126 1010_003_data.csv				10:36	3:39	75.8	43	22.020	7	53.550	overcast	Ns&Cb	8	1	270	1019.2	62	medium	12.0		calm	0.3		no					
		bou c-ops 120126 1010_004_data.csv				10:47	5:03	89.6	43	21.960	7	53.290	overcast	Ns&Cb	8	1	270	1019.2	62	medium	12.0		calm	0.3		no					
	bou c-ops 120126	1055_001_data.csv				11:50	2:21																								
				CTDBOUS006	HPLC, Ap, CDOM, POC & cyto	11:23	35:00	400	43	22.014	7	53.241	overcast		8	3	18	1018.6	58		12.2	13.2	calm			no					
					Secchi01	12:00	4:00	16	43	22	7	54	overcast		8												no				
				CTDBOUS007		13:24	27:00	400	43	24.783	7	47.993	overcast		8	2	62	1018	48		12.6	13.4	calm			no					
				CTDBOUS008		14:36	28:00	400	43	27.660	7	41.860	overcast		7	2	65	1018	47		12.2	13.6	calm			no					
				CTDBOUS009		15:51	29:00	400	43	30.870	7	36.730	night		8	2	176	1018	47		12.2	14.4	calm			no					
			CTDBOUS010		17:01	28:00	400	43	33.850	7	30.790	night		8	3	174	1018.6	46		12.1	14.5	calm			no						
			CTDBOUS011		18:16	26:00	400	43	36.892	7	25.046	night		8	1	223	1018.8	50		12.0	14.5	calm			no						
			CTDBOUS012		19:19	28:00	400	43	39.019	7	21.150	night		8	1	212	1018	52		12.0	14.5	calm			no						
27/01/12			CTDBOUS013	HPLC, Ap & TSM	10:41	35:00	400	43	21.442	7	53.994	overcast		8	21	54	1023.1	73		11.1	13.1	moved			yes						
	bou c-ops 120127	1217_001_data.csv			12:19	1:20																									
		bou c-ops 120127 1217_006_data.csv				12:40	3:19	63.6	43	22.720	7	53.820	overcast	Ns	8	20	57	1022.4	75	medium	10.7		moved	1.5		yes					
		bou c-ops 120127 1217_007_data.csv				12:48	3:52	75.6	43	22.760	7	53.890	overcast	Ns	8	20	57	1022.4	75	medium	10.7		moved	1.5		yes					
		bou c-ops 120127 1217_008_data.csv				13:00	3:20	65.7	43	22.900	7	54.050	overcast	Ns	8	20	57	1022.4	75	medium	10.7		moved	1.5		yes					
	bou c-ops 120127 1217_009_data.csv				13:32	1:54																									
				Secchi02	13:20	4:00	12	43	22	7	54	overcast		8												yes					
28/01/12					Bad weather																										

BOUSSOLE 119

25/01/2012

BOUS120125_01

BOUS001



Date 25/01/2012
Heure déb 11h 15min [TU]

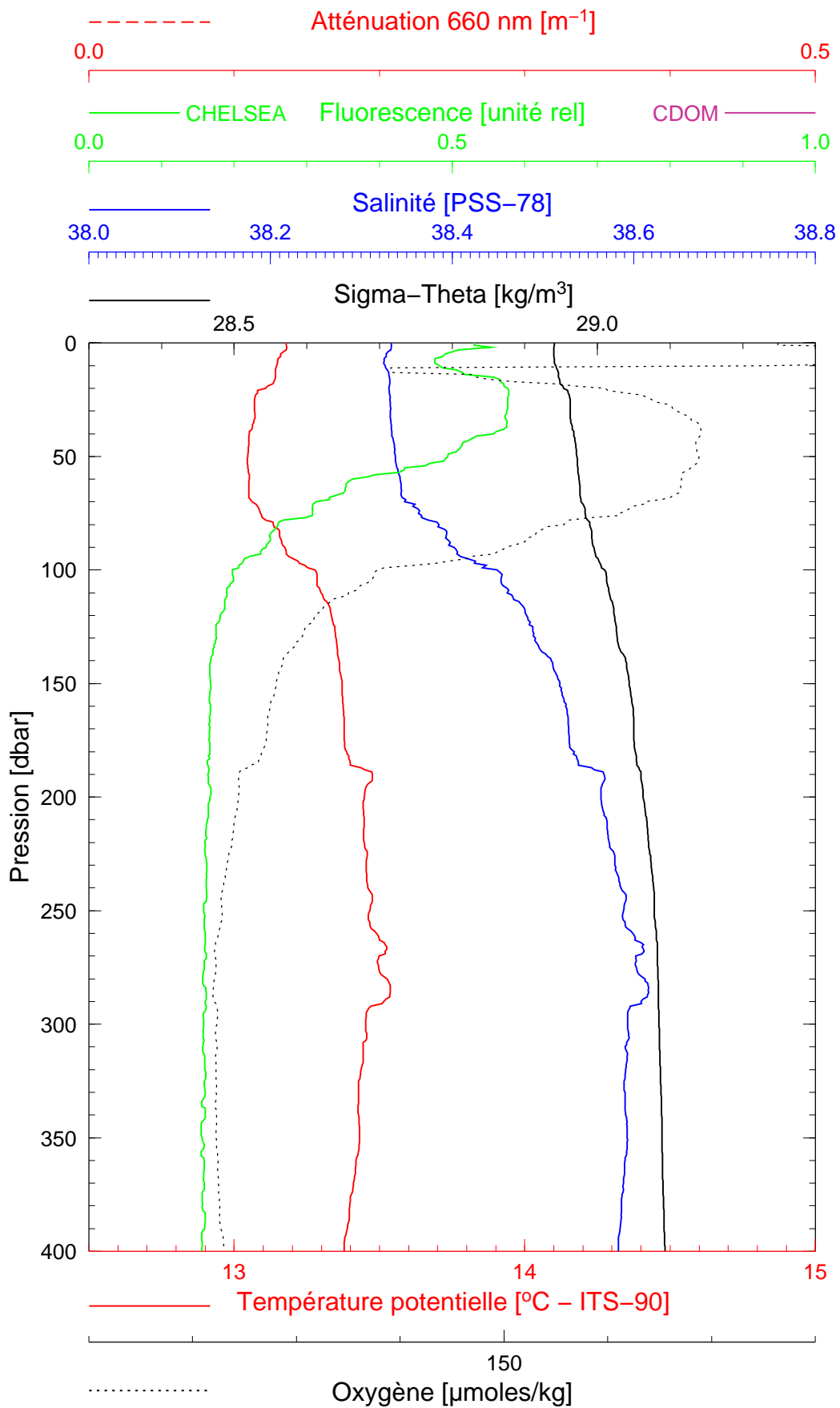
Latitude 43°22.060 N
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BOUSSOLE 119

25/01/2012

BOUS120125_02

BOUS002



Date 25/01/2012
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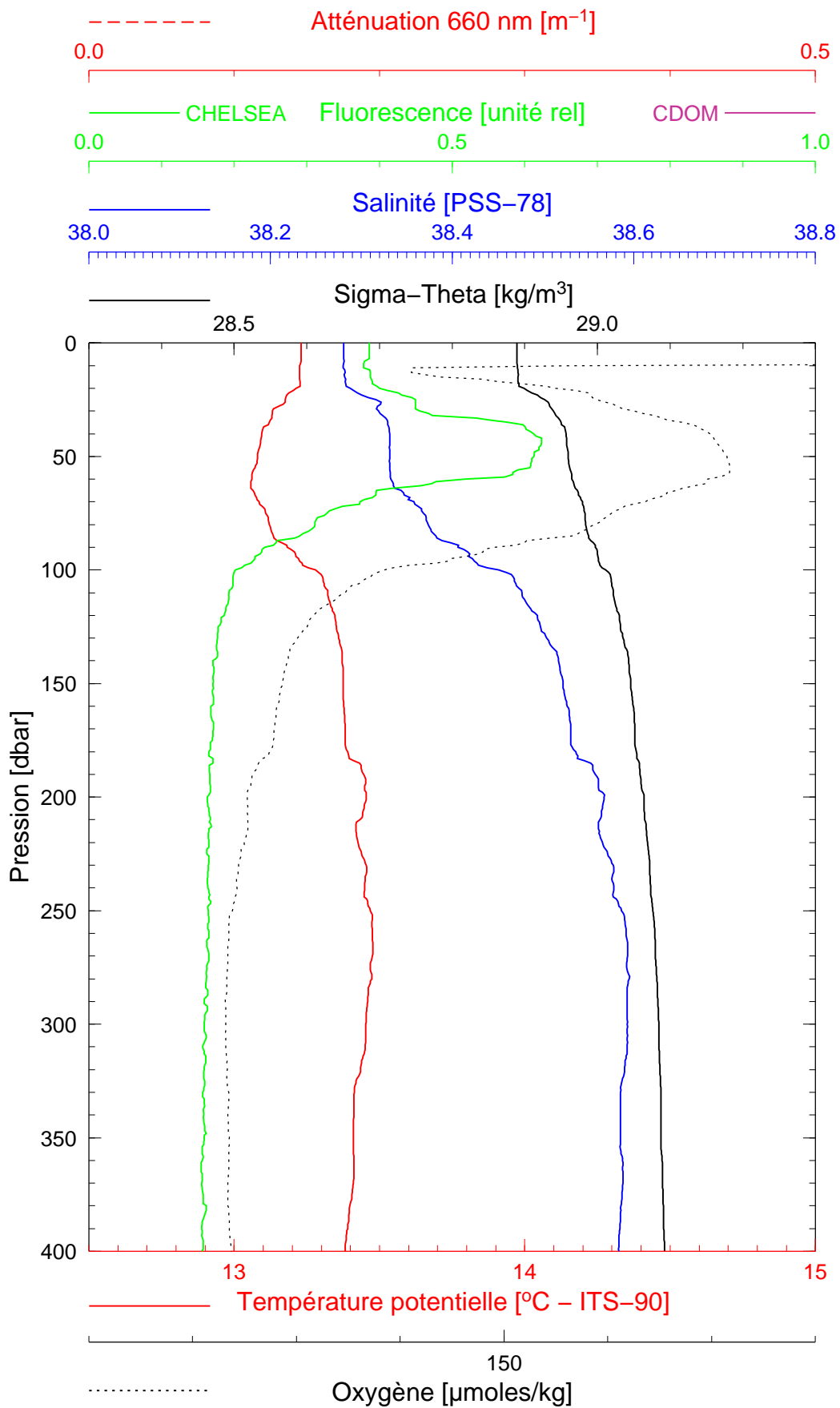
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BOUSSOLE 119

25/01/2012

BOUS120125_03

BOUS003



Date 25/01/2012
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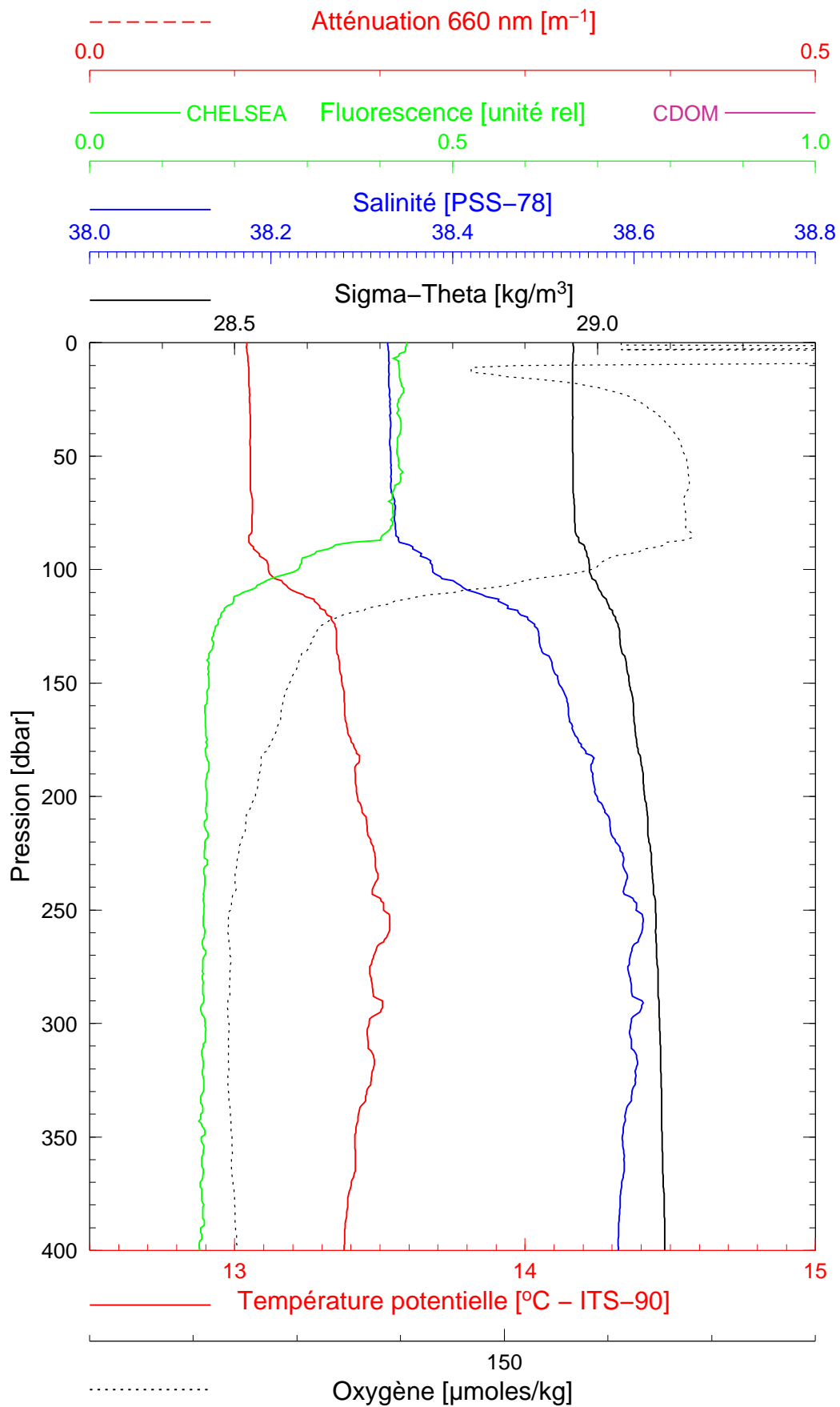
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BOUSSOLE 119

26/01/2012

BOUS120126_01

BOUS004



Date 26/01/2012
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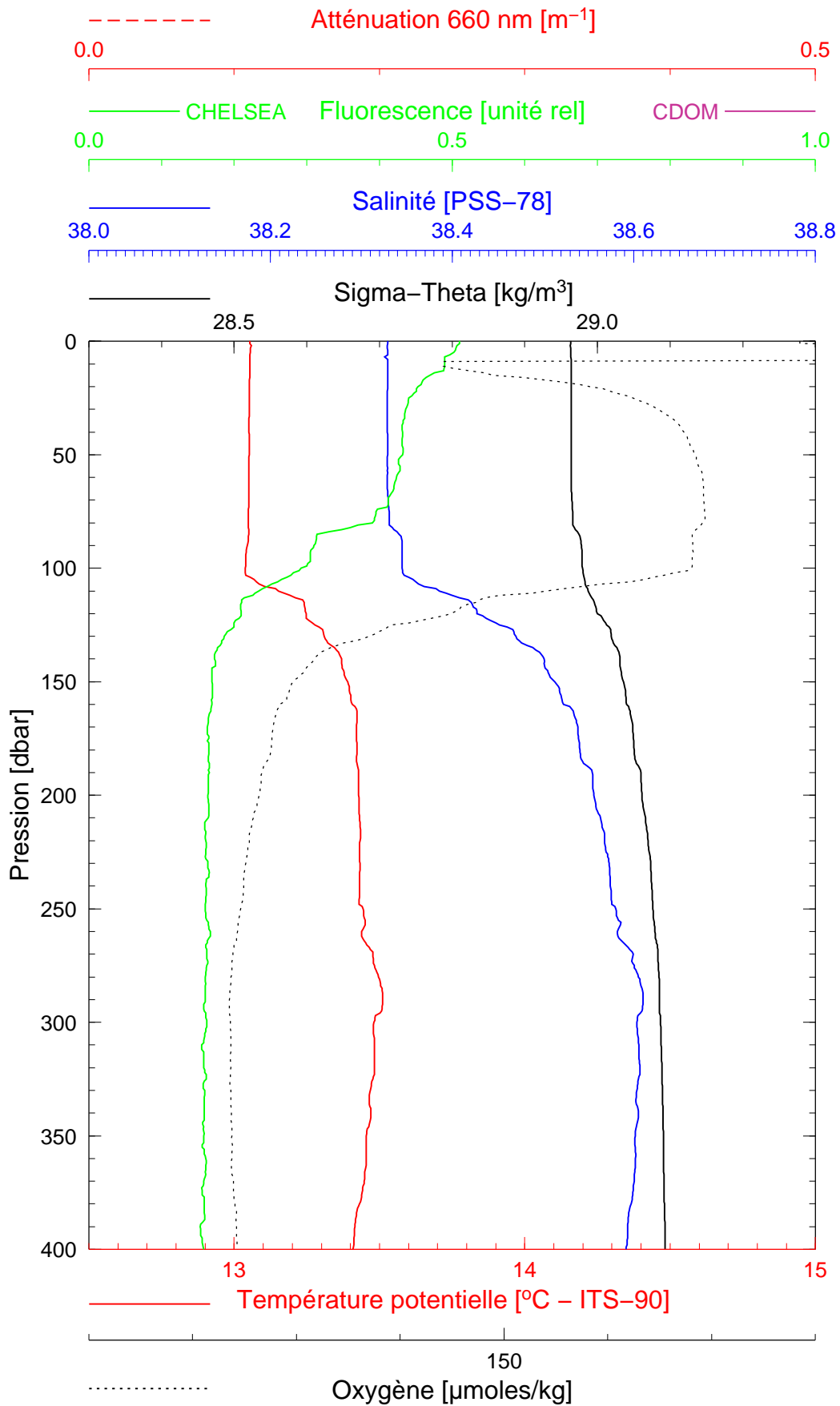
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BOUSSOLE 119

26/01/2012

BOUS120126_02

BOUS005



Date 26/01/2012
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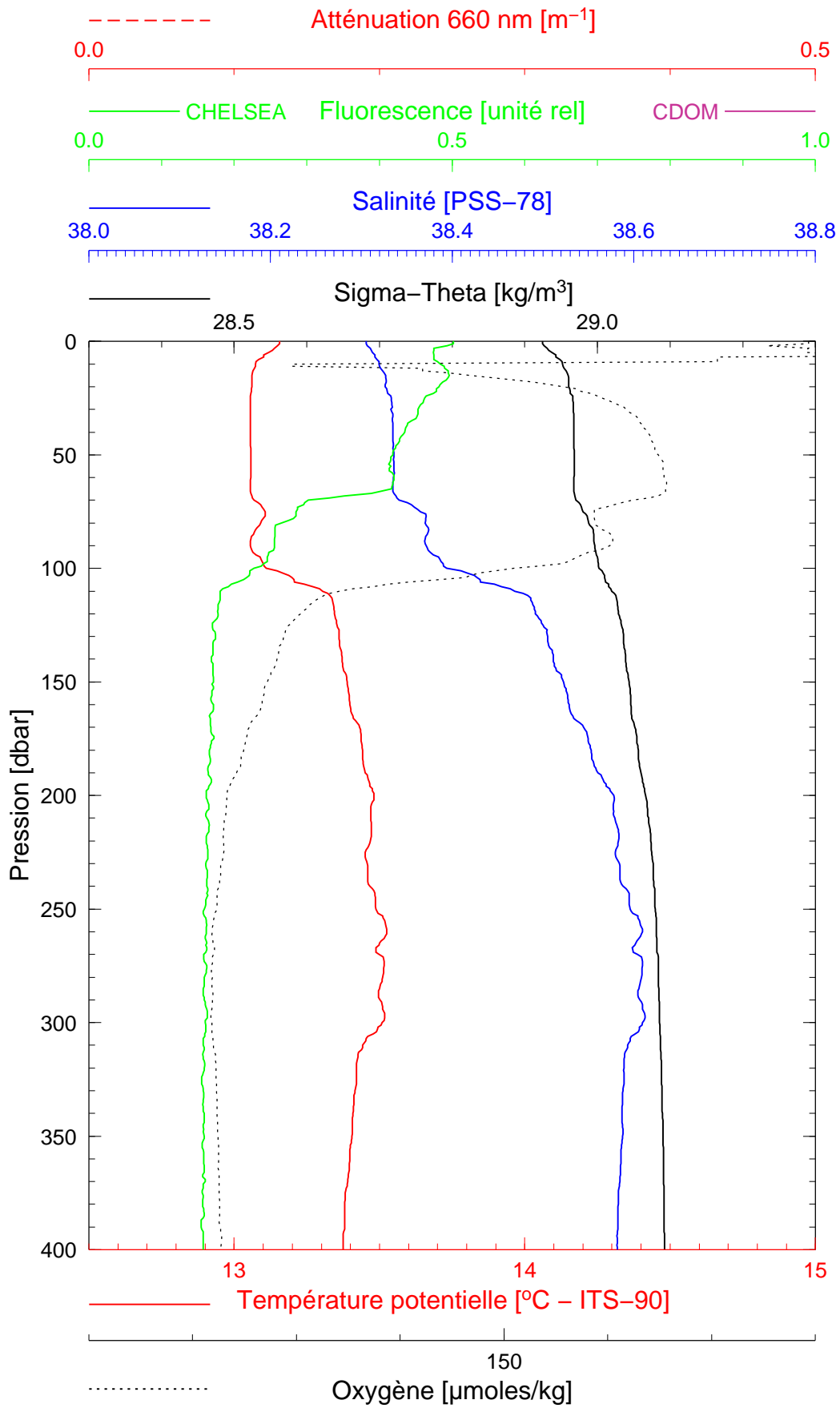
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BOUSSOLE 119

26/01/2012

BOUS120126_03

BOUS006



Date 26/01/2012
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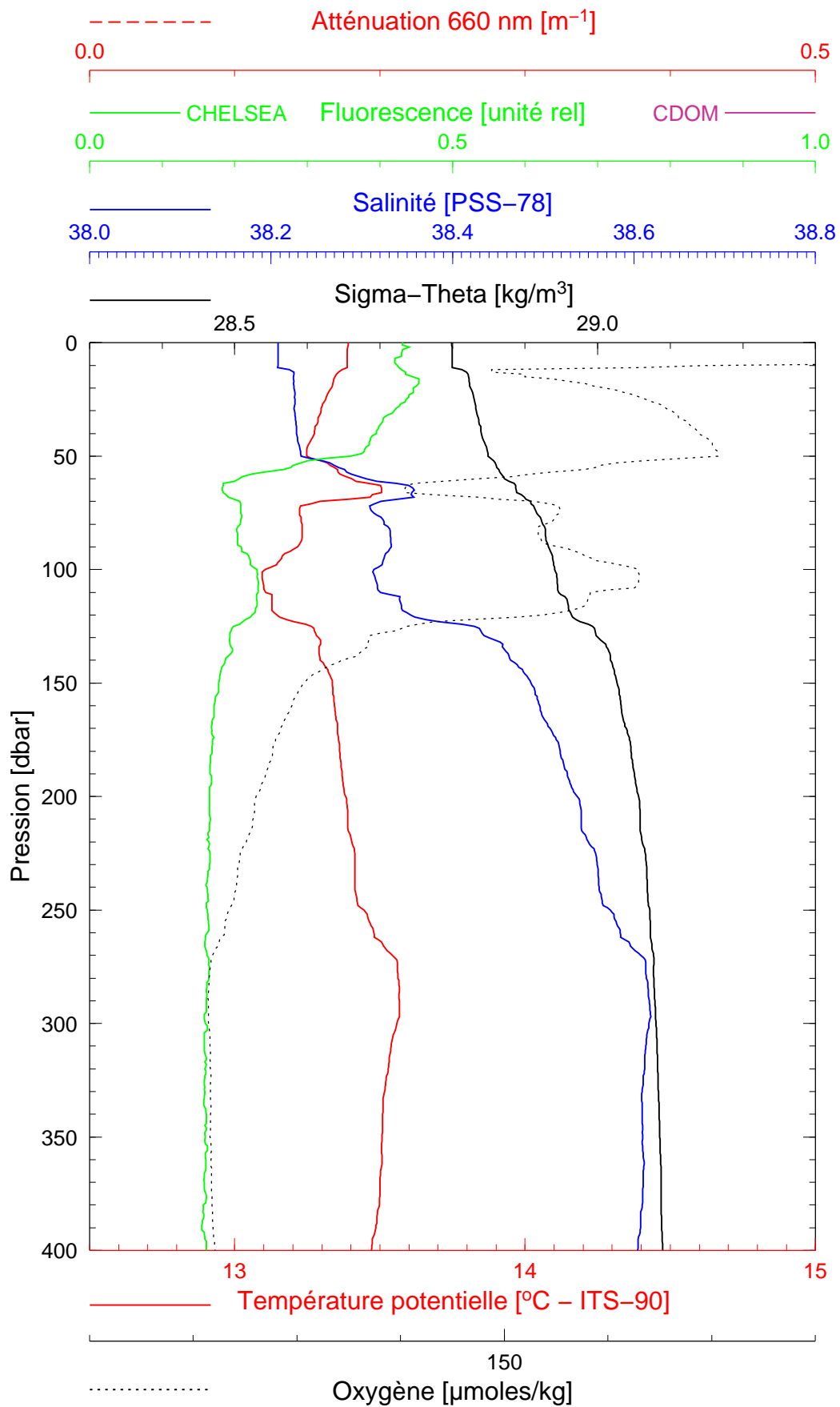
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BOUSSOLE 119

26/01/2012

BOUS120126_04

BOUS007



Date 26/01/2012
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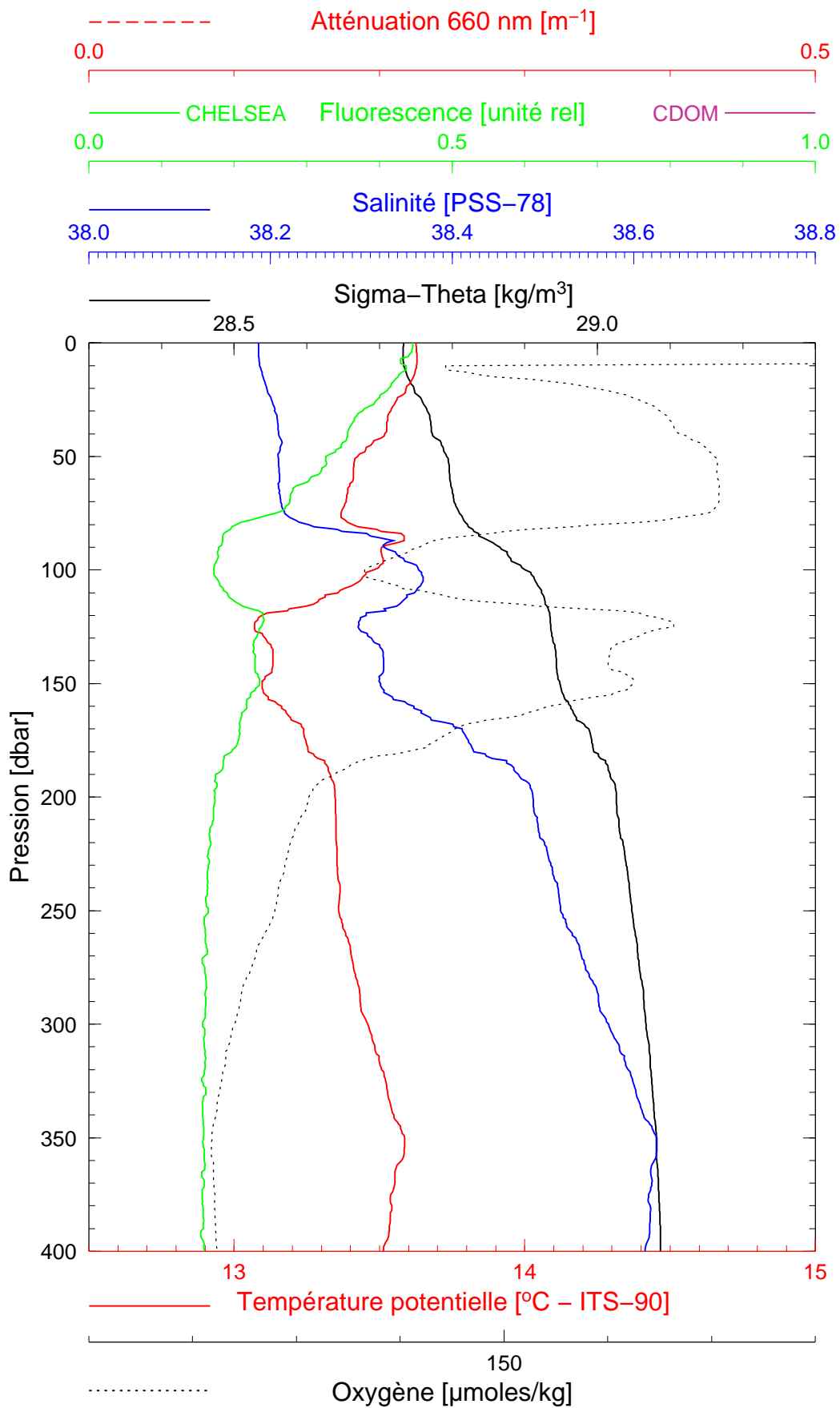
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BOUSSOLE 119

26/01/2012

BOUS120126_05

BOUS008



Date 26/01/2012
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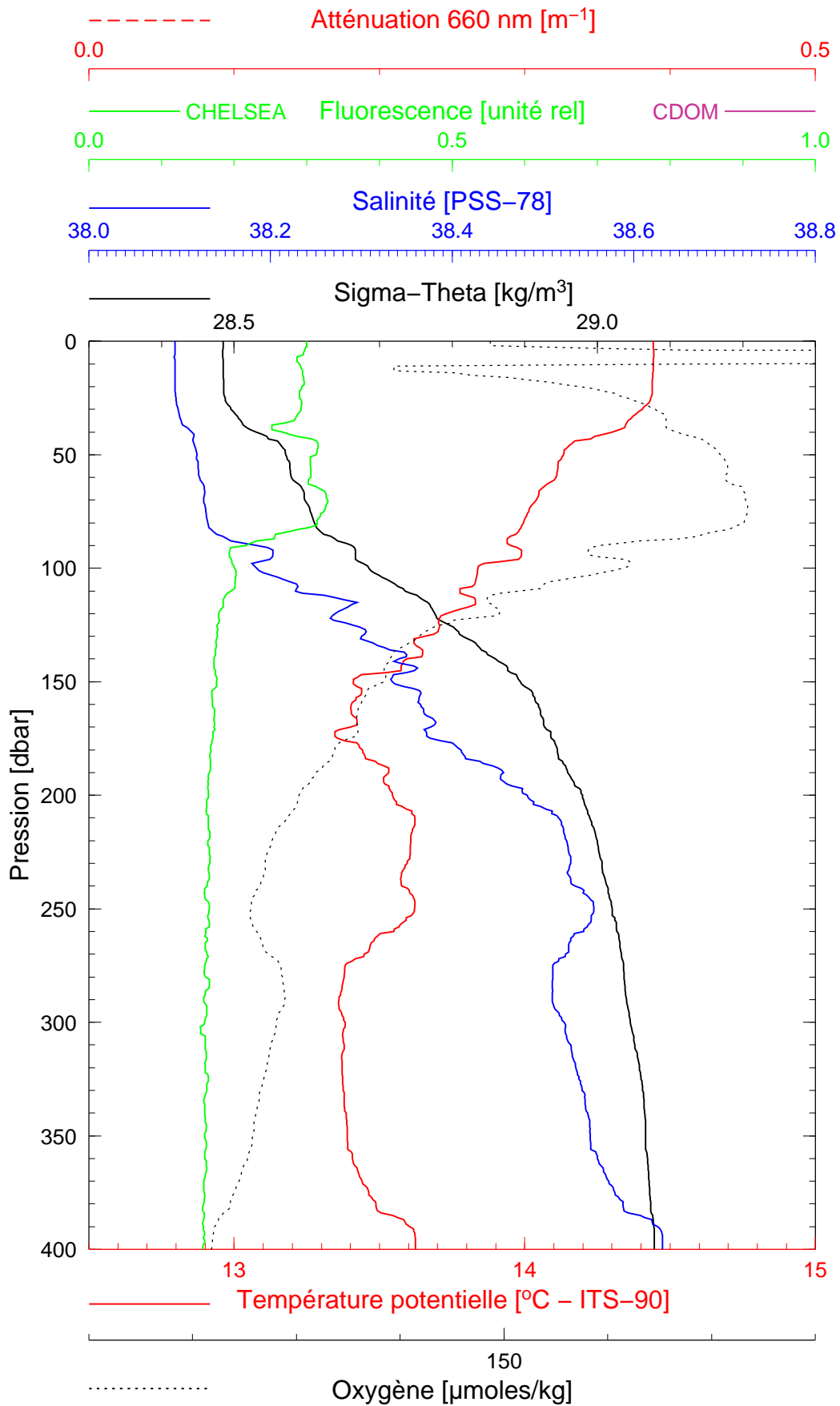
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BOUSSOLE 119

26/01/2012

BOUS120126_06

BOUS009



Date 26/01/2012
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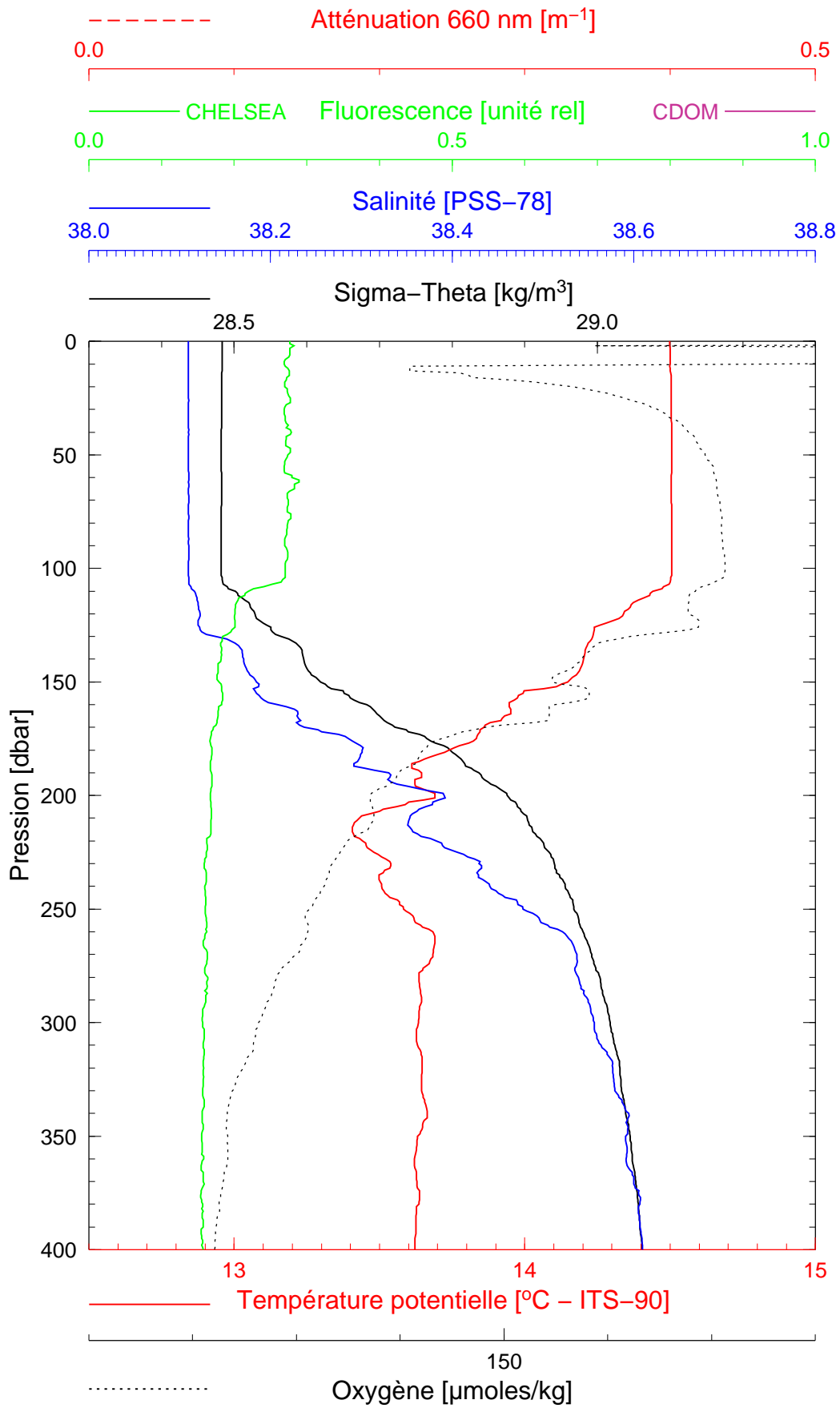
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BOUSSOLE 119

26/01/2012

BOUS120126_07

BOUS010



Date 26/01/2012
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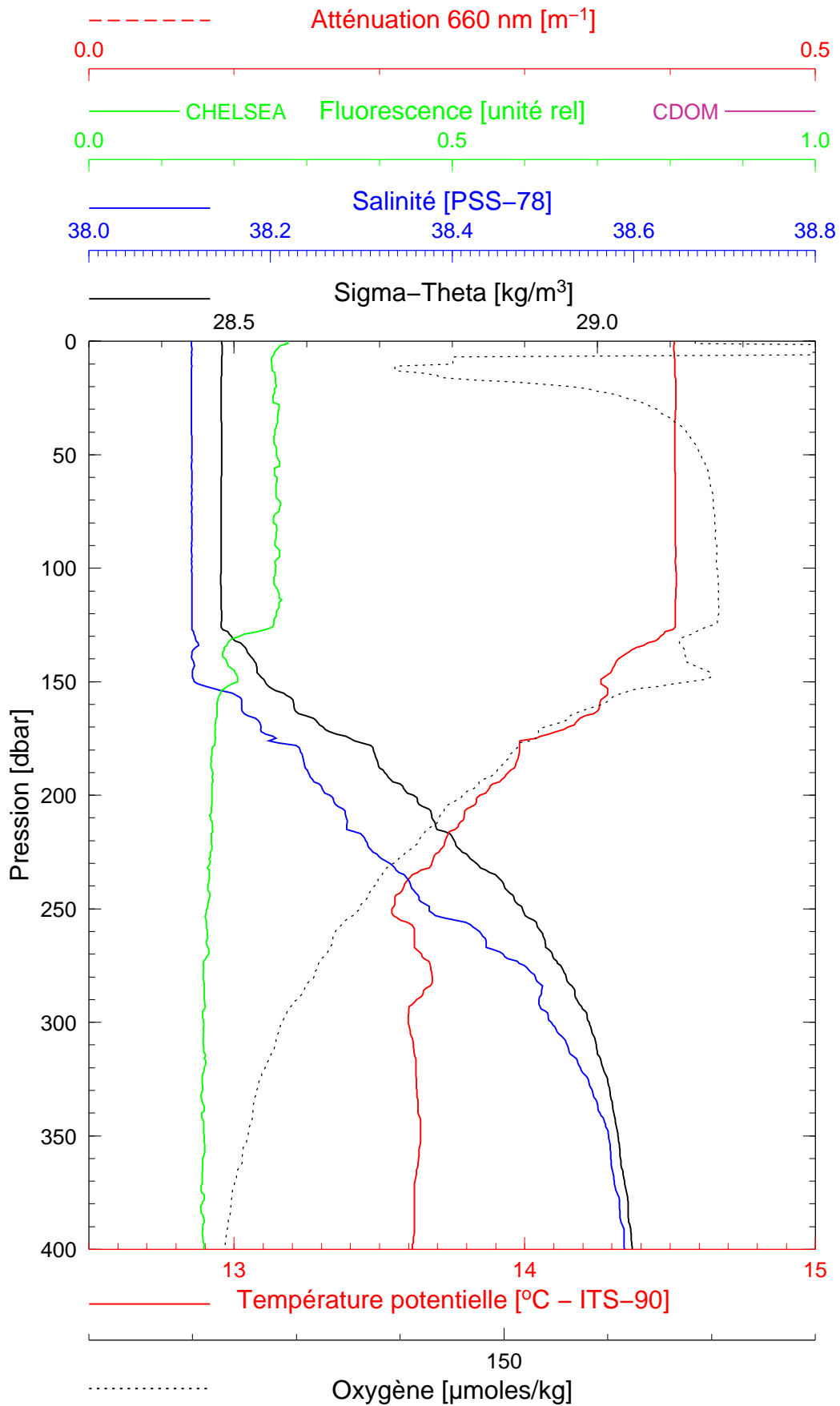
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BOUSSOLE 119

26/01/2012

BOUS120126_08

BOUS011



Date 26/01/2012
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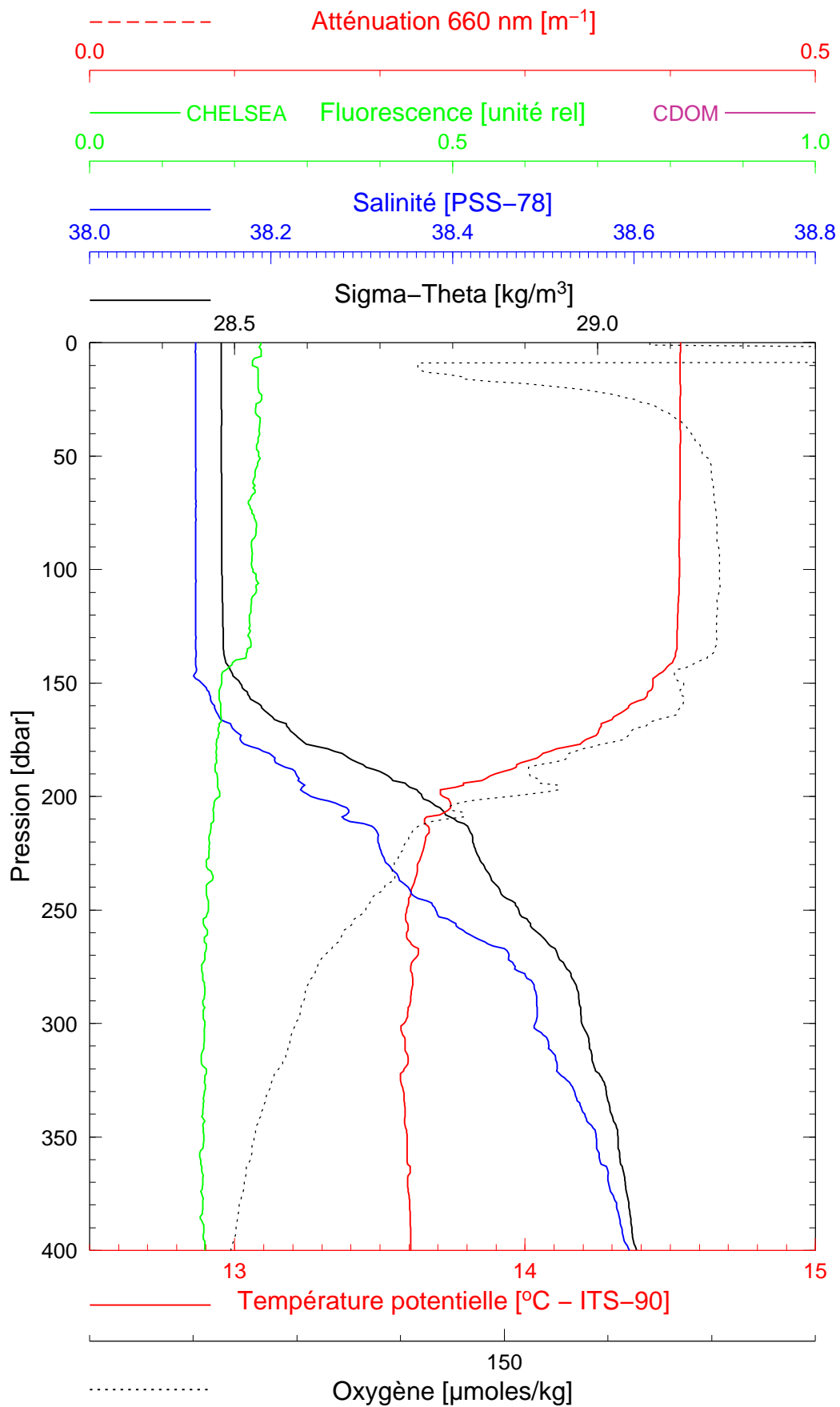
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BOUSSOLE 119

26/01/2012

BOUS120126_09

BOUS012



Date 26/01/2012
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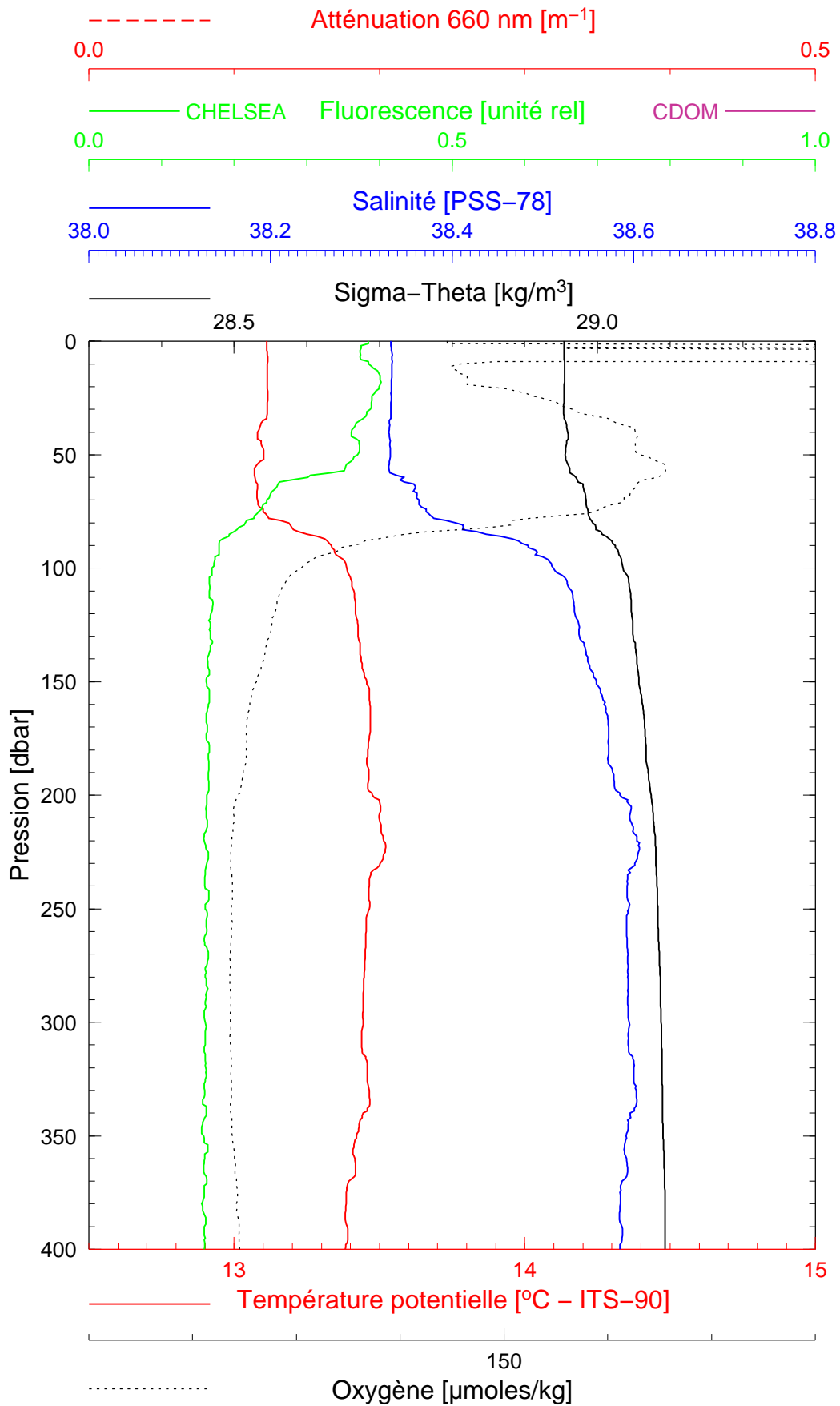
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BOUSSOLE 119

27/01/2012

BOUS120127_01

BOUS013



Date 27/01/2012
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