BOUSSOLE Monthly Cruise Report

Cruise 114
August 15 - 17, 2011

Duty Chief: Emilie Diamond (diamond@obs-vlfr.fr)
Vessel: R/V Téthys II
(Captain: Rémy Lafond)

Science Personnel: Emilie Diamond, Shaoqi Gong, Yves Lamblard, Pascal Lapébie, David Luquet, Grigor Obolensky and Didier Robin.

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A common stingray caught by a fishing line illegally attached on the BOUSSOLE buoy and released by the divers before the cleaning operations.

BOUSSOLE project

ESA/ESRIN contract N° 13226/10/I-NB

September 05, 2011

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

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 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 in N2 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 (TSM) weighting in the lab.

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 day of this transect should be similar for each cruise, if possible to minimise 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 surface, 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 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

No additional operation during this cruise.

Cruise Summary

The three cruise days were used for optical profiles and CTD casts with water sampling at the BOUSSOLE site. The first day was also used for completing the transect, the second day for diving operations and buoy data retrieval and the last day for atmospheric aerosol optical thickness measurements.

Monday 15 August 2011

The first day, the sea was smooth with a light to moderate breeze. The visibility was good with a blue overcast sky. When arrived at the BOUSSOLE site, 1 CTD cast with water sampling and 4 C-OPS profiles were performed. Then the sky conditions were too unstable to continue the optical profiles series so we went back to the buoy for data retrieval. But during this time, an underwater hunter was swimming around the buoy. We asked him and the captain of his boat to leave this area immediately. The CISCO connection with the buoy was attempted but failed. Then the CTD transect was performed.

Tuesday 16 August 2011

The second day, the sea was smooth with a gentle breeze. The sky was overcast and hazy the morning and blue the afternoon with a good visibility. When arrived at the BOUSSOLE site, divers went at sea to clean buoy instruments. A fishing line was illegally knotted on the buoy (depth ~6m). The divers cut the line before cleaning the instruments and putting neoprene caps on the HS4 and on the transmissometers for acquiring dark measurements. In parallel to diving operations, solar panels, sensors and ARGOS and CISCO connectors on the

top of the buoy were cleaned and another fish hook was found around the ARGOS beacon. A direct connection with the buoy was established for data retrieval. Then, 1 CTD cast with water sampling, 4 C-OPS profiles and 1 Secchi disk were performed. On the way of back, the divers also checked if there was no fishing line attached on the weather forecast Météo-France buoy.

Wednesday 17 August 2011

The last day, the sea was calm to smooth with a light breeze, a blue sky and a good visibility. When arrived at the BOUSSOLE site, 1 CTD cast with water sampling, 6 C-OPS profiles, 5 set of CIMEL measurements and 1 Secchi disk were performed. Then a CISCO connection with the buoy was established for data retrieval but the communication was lost before finishing the download.

Cruise Report

Monday 15 August 2011 (UTC)

People on board: Emilie Diamond and Grigor Obolensky.

0510 Departure from the Nice harbour.
0830 Arrival at the BOUSSOLE site.
0840 CTD 01, 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.
0930 C-OPS: connection lost so connectors cleaned again.
0940 C-OPS 01, 02, 03, 04.
1115 CISCO connection with the buoy: unsuccessful.
1130 Departure to the first transect station.
1200 CTD 02, 400 m, station 01 (43°25'N 07°48'E).
1255 CTD 03, 400 m, station 02 (43°28'N 07°42'E).
1355 CTD 04, 400 m, station 03 (43°31'N 07°37'E).
1455 CTD 05, 400 m, station 04 (43°34'N 07°31'E).
1555 CTD 06, 400 m, station 05 (43°37'N 07°25'E).
1645 CTD 07, 400 m, station 06 (43°39'N 07°21'E).
1715 Departure to the Nice harbour.
1745 Arrival at the Nice harbour.

Tuesday 16 August 2011 (UTC)

People on board: Emilie Diamond, Pascal Lapébie, Grigor Obolensky and 3 divers.

0500 Departure from the Nice harbour.
0825 Arrival at the BOUSSOLE site.
0835 Diving on the buoy for cleaning instruments. A fishing line illegally knotted on the buoy cut. Dark HS4 and transmissometers measurements at 09:00, 09:15 and 09:30.
0845 Cleaning of solar panels, sensors and ARGOS and CISCO connectors on the head of the buoy.
0915 Direct connection with the buoy and data retrieval
1000 CTD 08, 400 m with water sampling at 400, 200, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p, TSM and CDOM.
1045 Filtrations HPLC and CDOM.
1200 C-OPS 05, 06, 07, 08.
1250 Secchi disk 01 (23 m).
1300 Departure to the Météo-France buoy.
1330 Diving on the Météo-France buoy.
1400 Departure to the Nice harbour.
1700 Arrival at the Nice harbour.

Wednesday 17 August 2011 (UTC)

People on board: Emilie Diamond, Shaoqi Gong and Grigor Obolensky.

0430 Departure from the Nice harbour.
0750 Arrival at the BOUSSOLE site.

0800 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 and TSM.
0810 CIMEL 01: incomplete.
0845 C-OPS 09, 10, 11.
0915 CIMEL 02.
0930 C-OPS 12, 13, 14.
1020 CIMEL 03, 04, 05.
1050 Secchi disk 02 (22 m).
1115 CISCO connection with the buoy and incomplete data retrieval.
1130 Departure to the Nice harbour.
1445 Arrival at the Nice harbour.

Problems identified during the cruise

- During this cruise, data from the CDOM fluorometer were apparently corrupted in the upper 150m of down casts except for CTD 01 and CTD 06.
- The first day an underwater hunter was swimming around the buoy and the second day divers found a fishing line knotted on the buoy (depth ~6m).

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

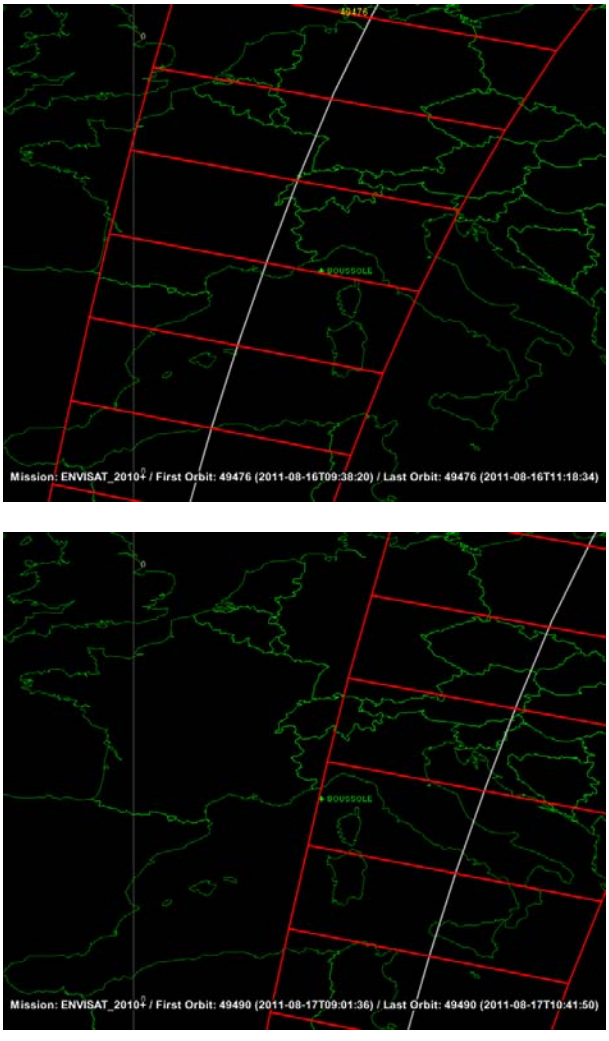


Figure 1. Calculated swath path for MERIS (Esov NG software) above the BOUSSOLE site for the 16th and 17th of August 2011.

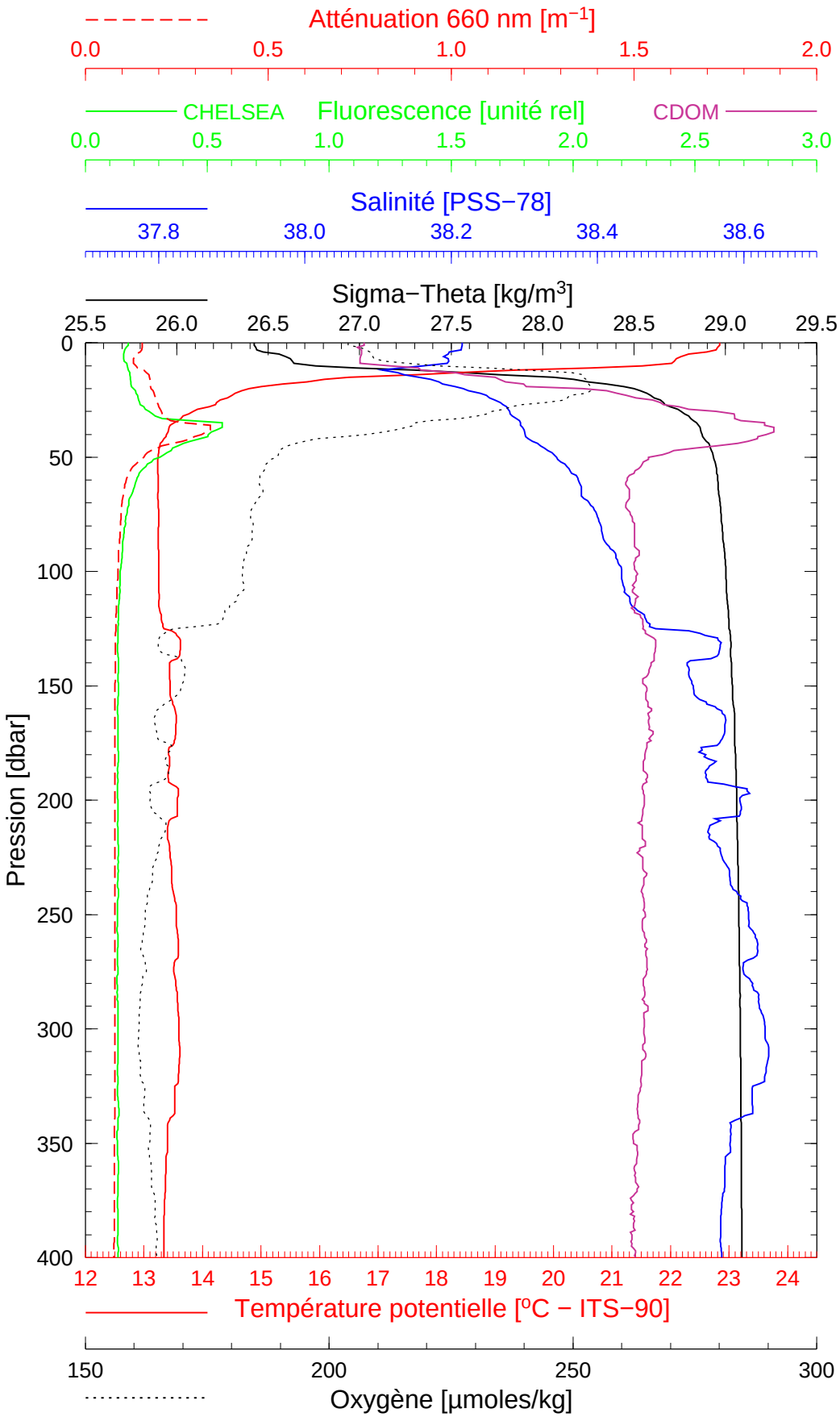
Appendices

Cruise Summary Table for Boussole 114

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")	satellite overpass		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
			CTDBOUS001	HPLC, Ap & TSM	08:44	33:00	400	43	22.159	7	53.855	overcast		6	7	113	1011	87		22.7	22.8	calm			no
	bou_c-ops_110815_0841_001_data.csv				08:42	1:12																		
		bou_c-ops_110815_0939_002_data.csv			09:52	4:50	100.4	43	22.002	7	53.732	blue	Ci	1	1	127	1012.0	84	good	24.1		calm	0.3		no
		bou_c-ops_110815_0939_003_data.csv			10:04	3:16	65.5	43	22.009	7	53.511	blue	Ci	1	1	127	1012.0	84	good	24.1		calm	0.3		no
		bou_c-ops_110815_0939_004_data.csv			10:14	3:09	61.0	43	21.966	7	53.308	blue	Ci	1	1	127	1012.0	84	good	24.1		calm	0.3		no
		bou_c-ops_110815_0939_005_data.csv			10:23	2:38	50.7	43	21.915	7	53.123	blue	Ci&Cc	3	5	233	1011.9	83	good	24.8		calm	0.4		no
15/08/11	bou_c-ops_110815_0939_007_data.csv				11:02	1:21																		
			CTDBOUS002		12:02	26:00	400	43	24.987	7	47.999	overcast		6	11	241	1012	84		23.4	23.5	calm			no
			CTDBOUS003		13:00	25:00	400	43	27.553	7	42.728	overcast		5	13	246	1012	83		23.6	23.5	calm			no
			CTDBOUS004		13:59	28:00	400	43	30.984	7	36.895	overcast		5	11	67	1012	81		23.8	23.6	calm			few
			CTDBOUS005		15:00	26:00	400	43	34.022	7	30.978	overcast		6	10	25	1013	82		24.0	24.1	calm			few
			CTDBOUS006		15:57	24:00	400	43	37.087	7	25.176	overcast		6	11	23	1013	82		24.2	24.3	calm			few
			CTDBOUS007		16:44	27:00	400	43	39.052	7	21.187	overcast		4	11	49	1013	81		24.1	24.1	calm			few
			CTDBOUS008	HPLC, Ap, TSM & CDOM	09:58	29:00	400	43	22.165	7	53.915	overcast		7	8	118	1016	83		23.2	22.8	calm			no
	bou_c-ops_110816_1200_001_data.csv				12:03	1:14																		
		bou_c-ops_110816_1200_003_data.csv			12:11	3:59	80.7	43	22.222	7	53.892	blue	Ci	1	7	163	1015.9	87	good	23.4		calm	0.4		no
16/08/11		bou_c-ops_110816_1200_004_data.csv			12:22	2:42	52.6	43	22.424	7	53.877	blue	Ci	1	7	163	1015.9	87	good	23.4		calm	0.4		no
		bou_c-ops_110816_1200_005_data.csv			12:30	3:08	60.9	43	22.549	7	53.857	blue	Ci	1	7	163	1015.9	87	good	23.4		calm	0.4		no
		bou_c-ops_110816_1200_006_data.csv			12:39	3:33	71.4	43	22.696	7	53.857	blue	Ci	1	7	163	1015.9	87	good	23.4		calm	0.4		no
	bou_c-ops_110816_1200_007_data.csv				13:17	1:14																		
				Secchi01	12:50	4:00	23	43	22	7	54	blue		1					good			calm			no
			CTDBOUS009	HPLC, Ap & TSM	08:05	22:00	400	43	22.189	7	53.893	overcast		6	2	3	1016	83		22.7	23.3	calm			no
				CIMEL01	08:14	7:00		43	22.224	7	53.948	blue		2			1016.4		good						
	bou_c-ops_110817_0751_001_data.csv				07:53	2:27																		
		bou_c-ops_110817_0751_002_data.csv			08:49	4:04	81.4	43	22.200	7	53.944	blue	None	0	2	169	1016.4	82	good	23.1		calm	0.1		no
		bou_c-ops_110817_0751_003_data.csv			09:03	3:40	75.0	43	22.362	7	53.829	blue	None	0	2	169	1016.4	82	good	23.1		calm	0.1		no
		bou_c-ops_110817_0751_004_data.csv			09:14	2:45	55.5	43	22.511	7	53.819	blue	None	0	2	169	1016.4	82	good	23.1		calm	0.1		no
				CIMEL02	09:19	7:00		43	22.586	7	53.824	blue		0			1016.5		good						
17/08/11		bou_c-ops_110817_0751_005_data.csv			09:32	3:14	65.5	43	22.216	7	53.979	blue	None	0	2	261	1016.6	79	good	23.7		calm	0.2		no
		bou_c-ops_110817_0751_006_data.csv			09:44	2:32	47.9	43	22.506	7	53.890	blue	None	0	2	261	1016.6	79	good	23.7		calm	0.2		no
		bou_c-ops_110817_0751_008_data.csv			09:55	3:03	60.4	43	22.709	7	53.892	blue	None	0	2	261	1016.6	79	good	23.7		calm	0.2		no
	bou_c-ops_110817_0751_009_data.csv				10:10	3:04																		
				CIMEL03	10:21	6:00		43	22.124	7	54.089	blue		1			1016.5		good						
				CIMEL04	10:28	7:00		43	22.154	7	54.132	blue		1			1016.5		good						
				CIMEL05	10:37	10:00		43	22.193	7	54.194	blue		1			1016.5		good						
				Secchi02	10:50	4:00	22	43	22	7	54	blue		1					good			calm			no

BOUSSOLE 114 **15/08/2011** **BOUS110815_01**

BOUS001

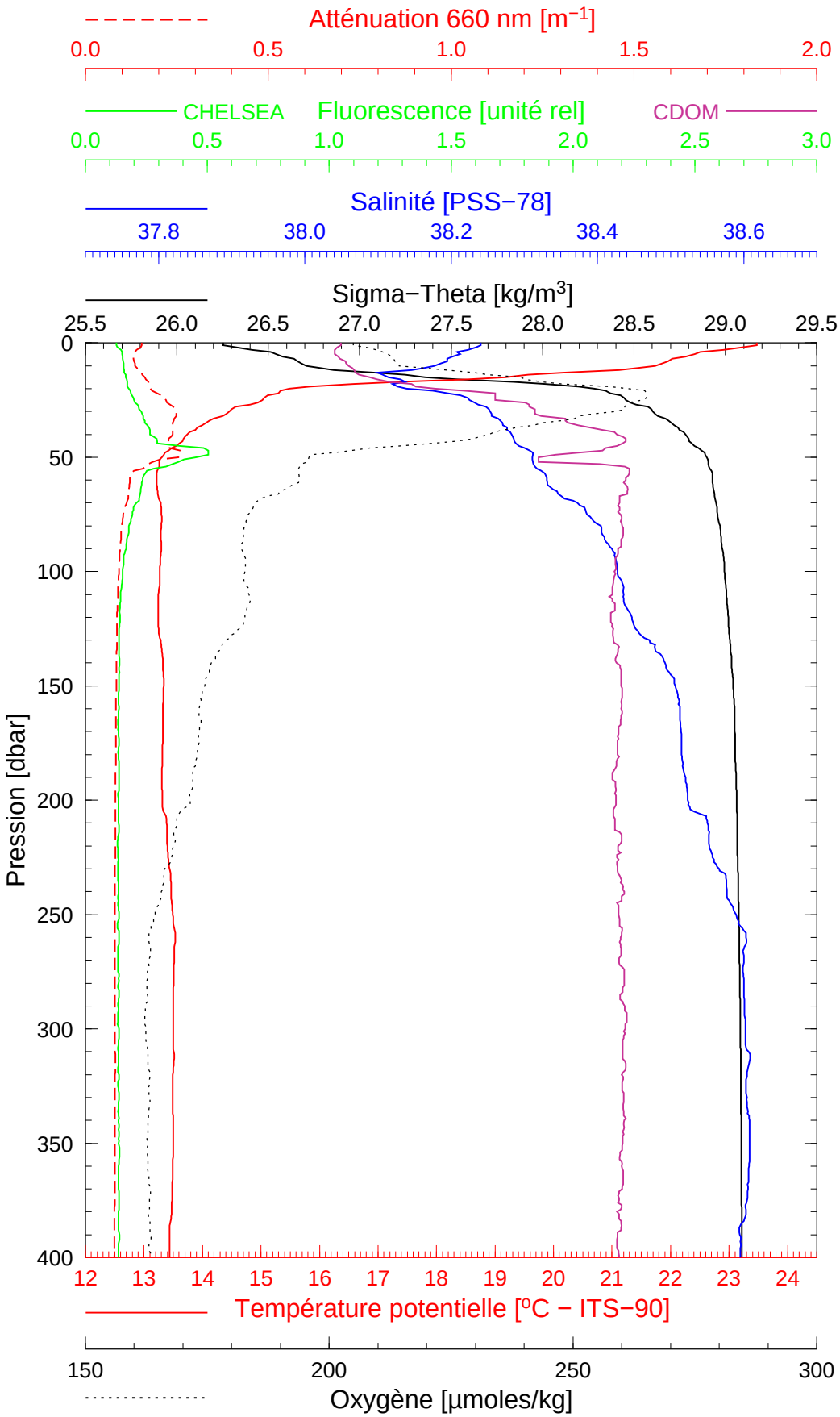


Date *15/08/2011* *Latitude* *43°22.159 N*

Heure déb *08h 44min [TU]* *Longitude* *07°53.855 E*

BOUSSOLE 114 **15/08/2011** **BOUS110815_02**

BOUS002



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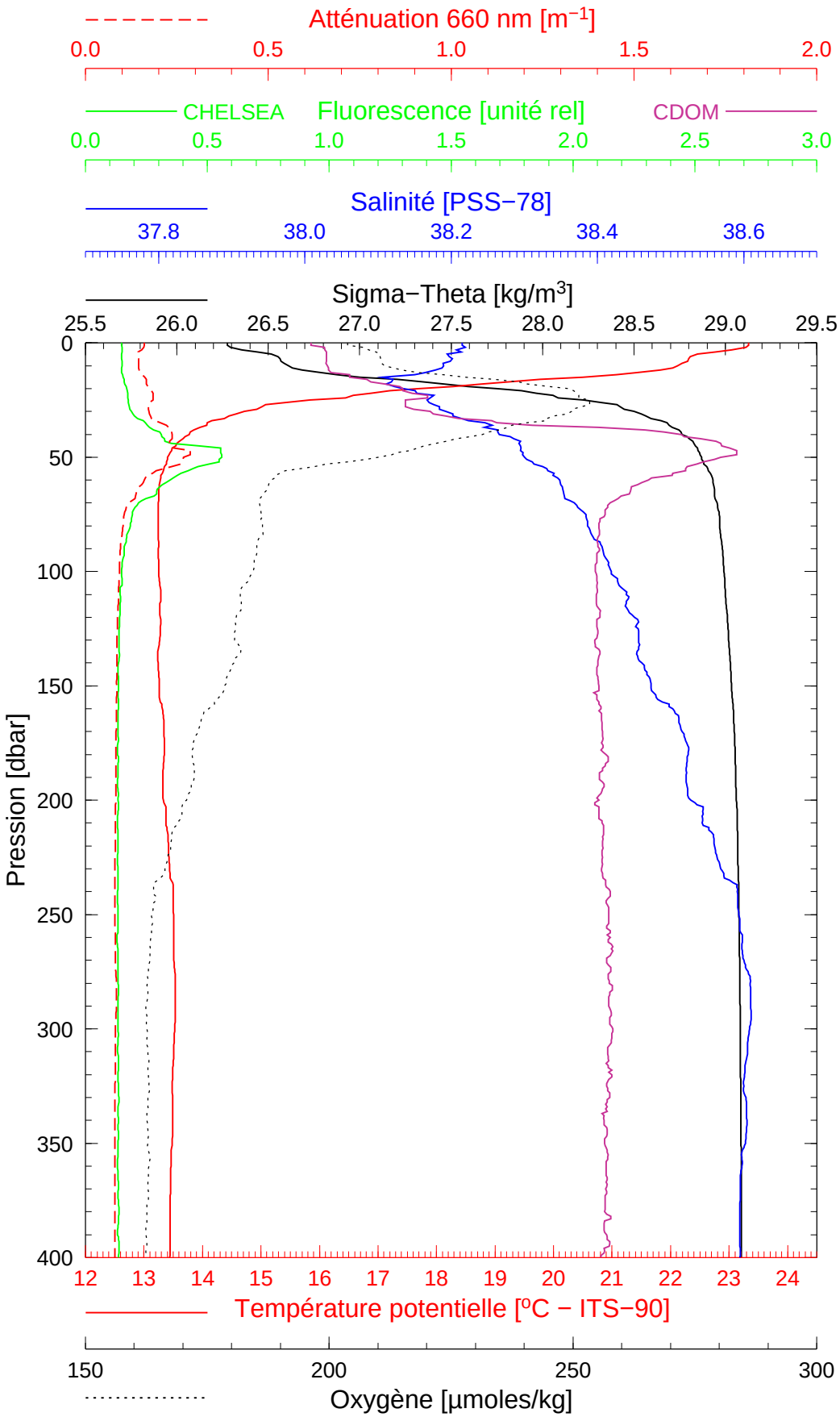
BOUS003



Date *15/08/2011* *Latitude* *43°27.553 N*

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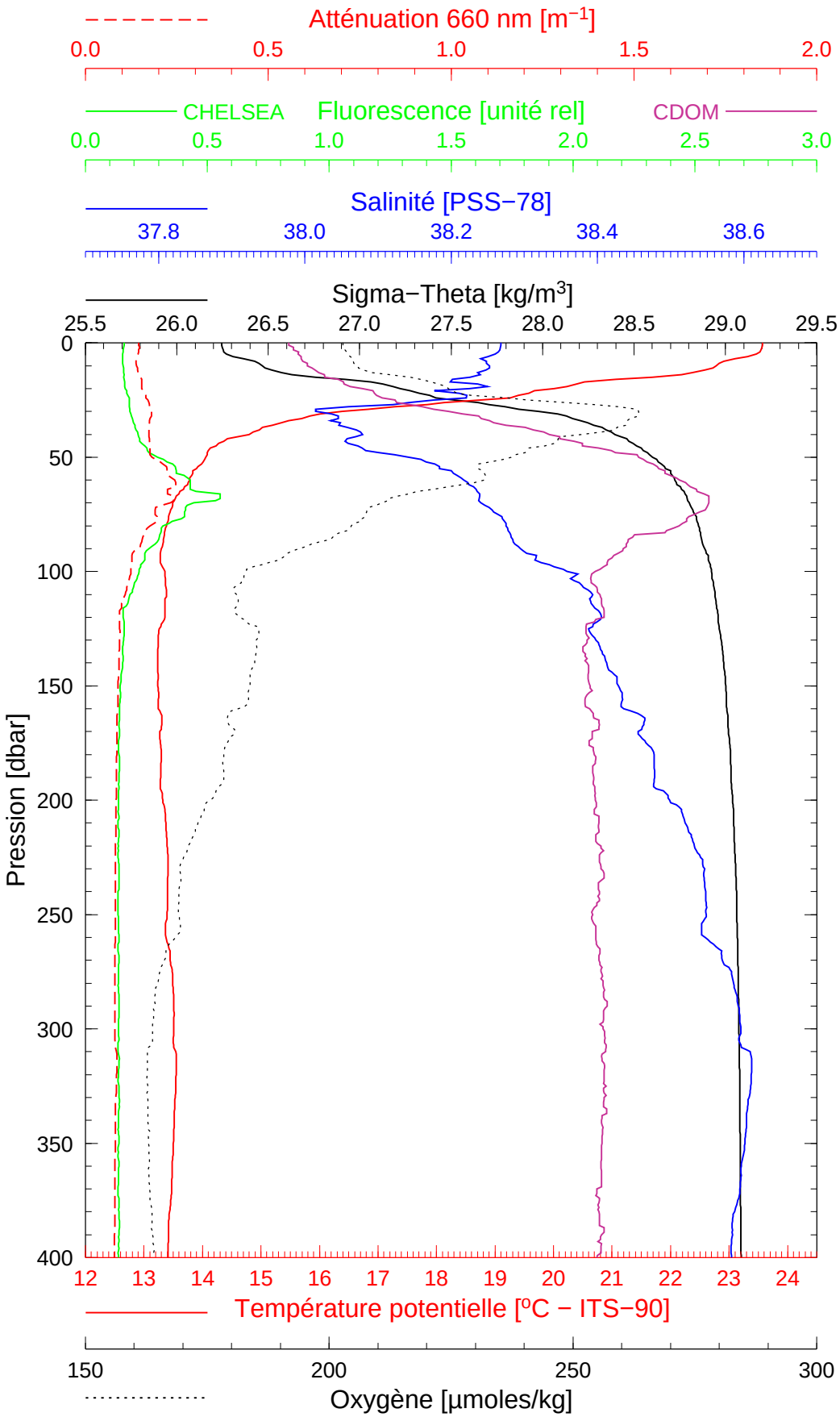
BOUSSOLE 114 **15/08/2011** **BOUS110815_04**

BOUS004



Date *15/08/2011* *Latitude* *43°30.984 N*

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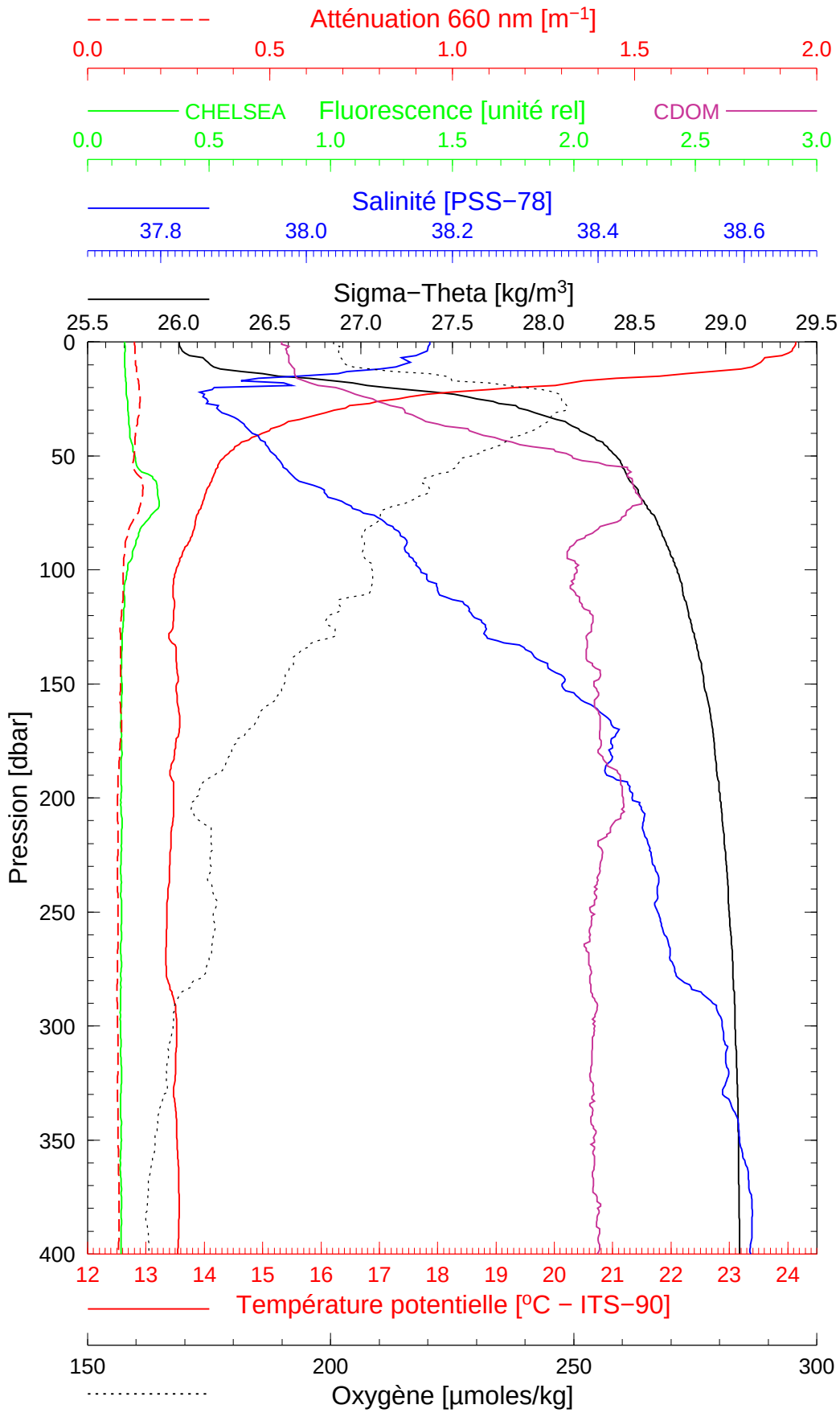
BOUSSOLE 114 **15/08/2011** **BOUS110815_05**

BOUS005



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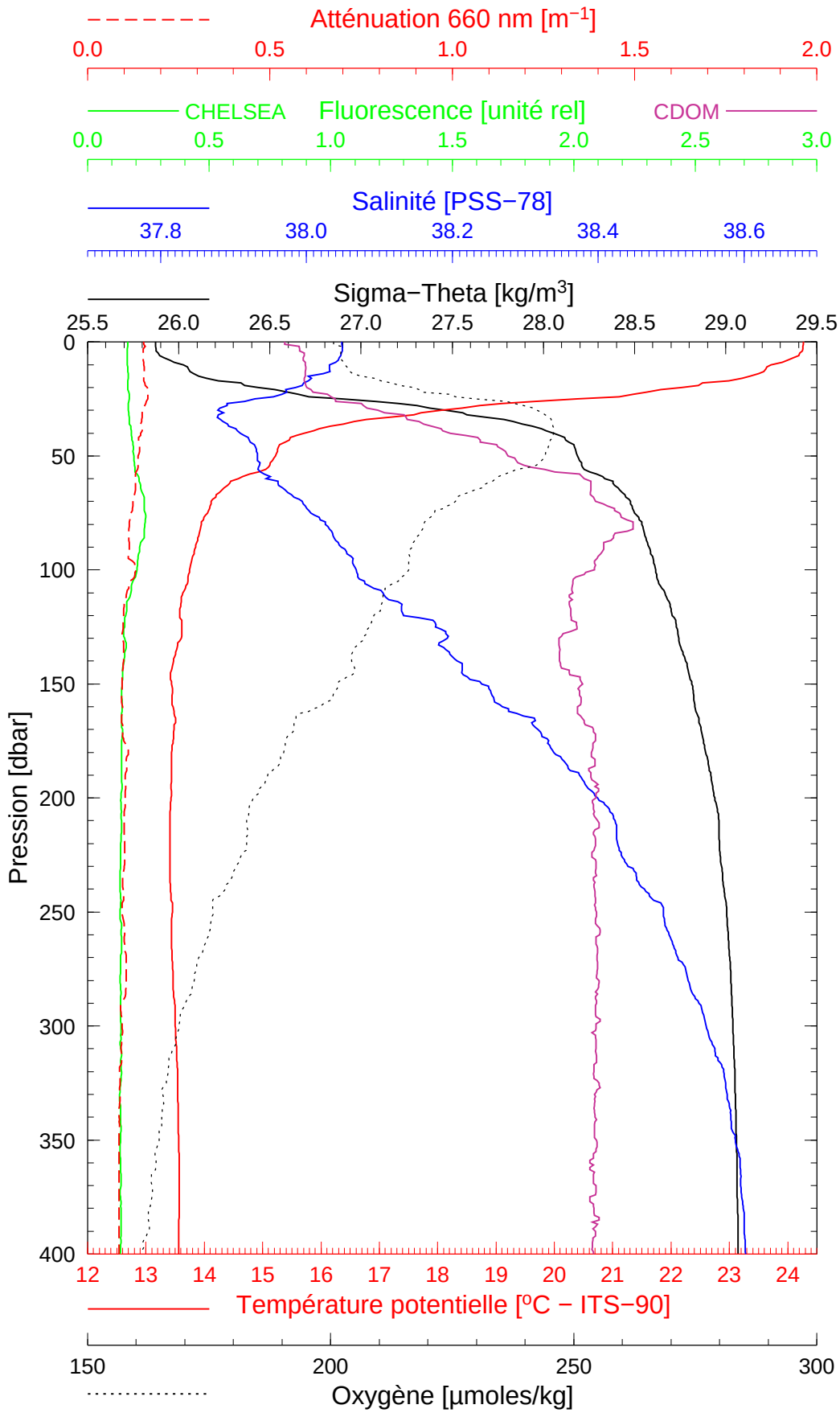
BOUS006



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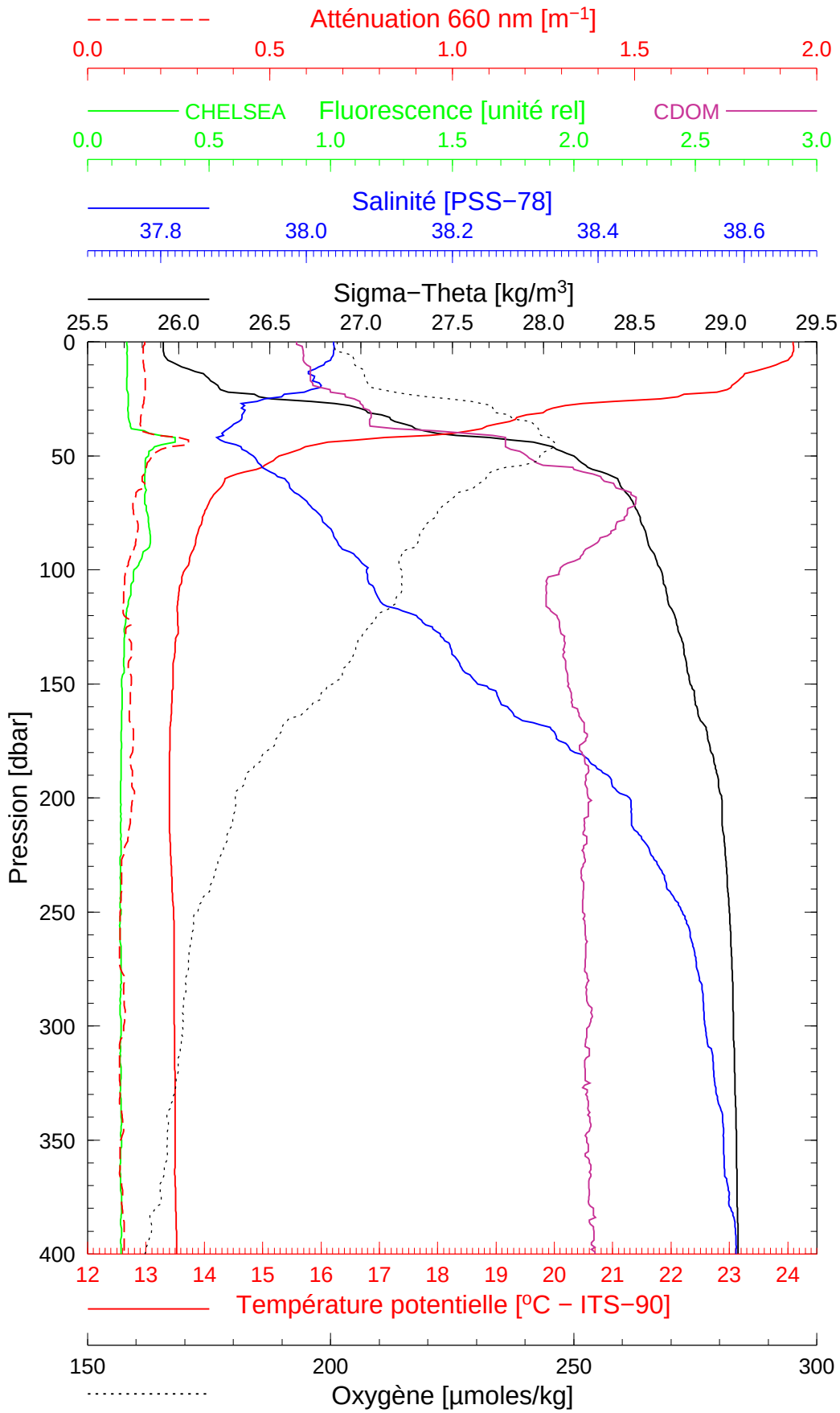
BOUSSOLE 114 **15/08/2011** **BOUS110815_07**

BOUS007



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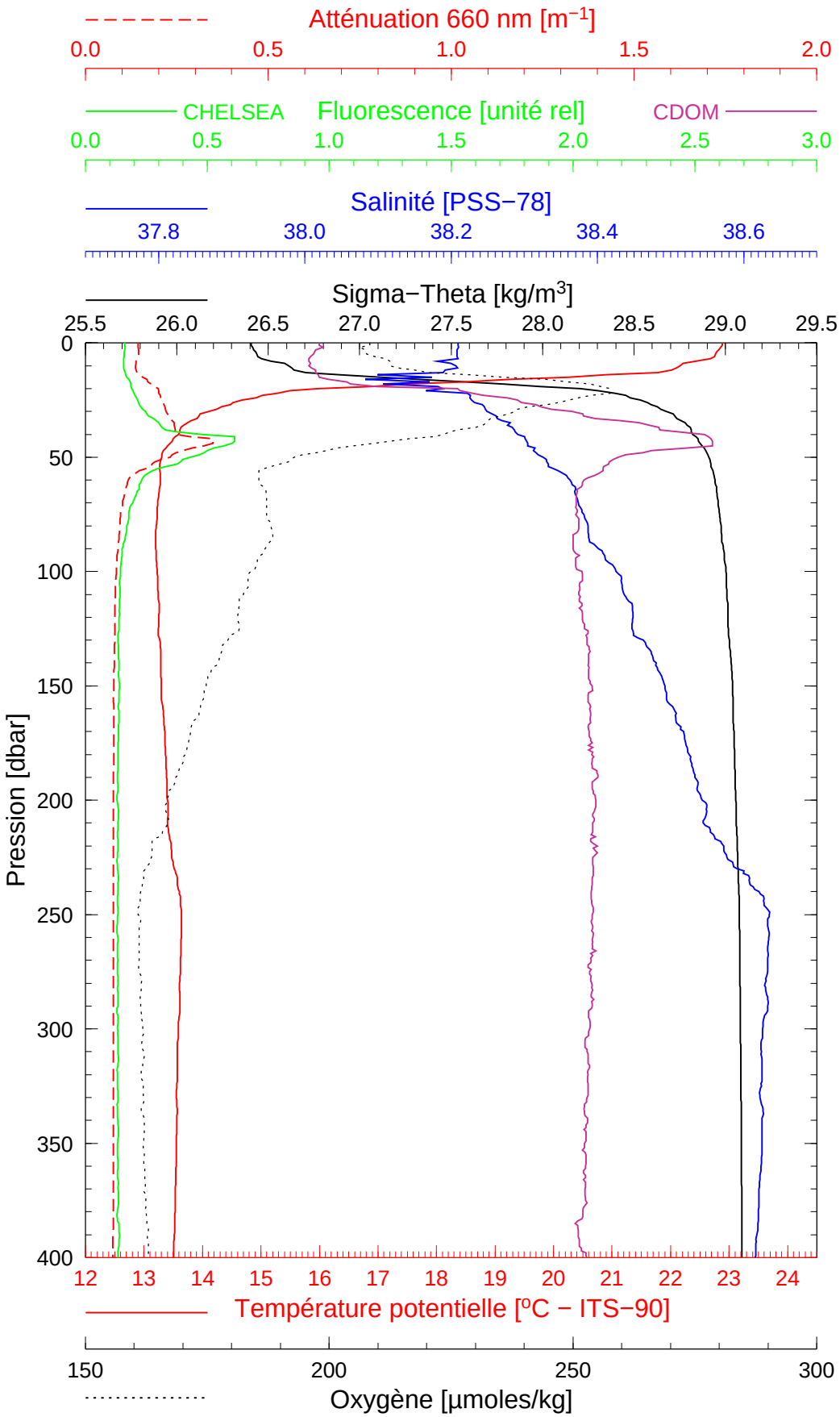
BOUSSOLE 114 **16/08/2011** **BOUS110816_01**

BOUS008



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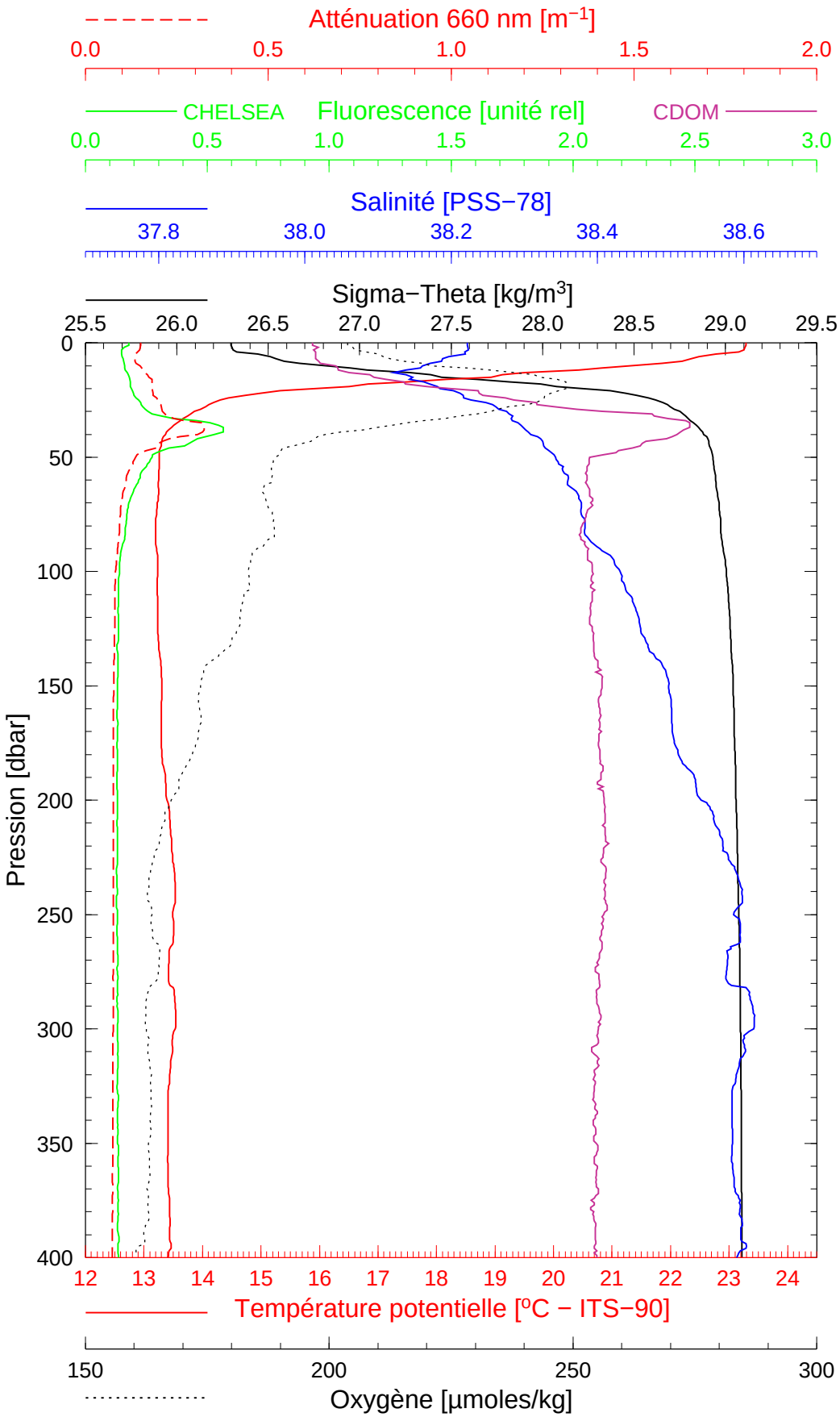
BOUSSOLE 114 **17/08/2011** **BOUS110817_01**

BOUS009



Date *17/08/2011* *Latitude* *43°22.189 N*

Heure déb *08h 04min [TU]* *Longitude* *07°53.893 E*