

BOUSSOLE Monthly Cruise Report

Cruise 115

September 13 - 15, 2011

Duty Chief: Emilie Diamond (diamond@obs-vlfr.fr)

Vessel: R/V Téthys II

(Captain: Guy Le Falher)

Science Personnel: Frederic Bailleul, Jean De Vaugelas, Emilie Diamond, David Luquet, Mustapha Ouhssain, Vincent Taillandier and Pierre (diver).

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



Several sea turtles were seen in the vicinity of the BOUSSOLE buoy during this cruise.

BOUSSOLE project

ESA/ESRIN contract N° 13226/10/I-NB

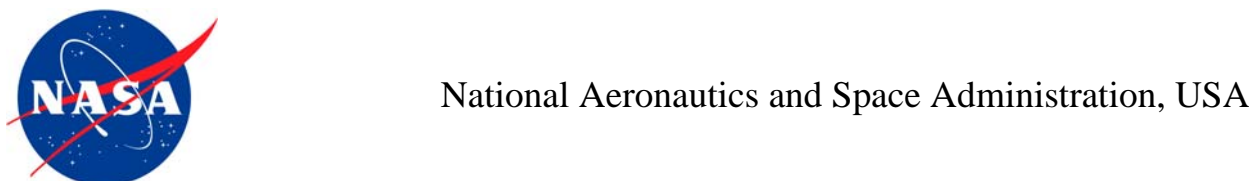
November 05, 2011



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



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

During this cruise, Frédéric Bailleul (from "Centre d'Etudes Biologiques de Chizé") has tested several CTD-fluorometer beacons that are planned to be deployed on elephant seals. They were installed on the BOUSSOLE rosette for comparison with the main CTD and fluorometer. The last day, Mustapha Ouhssain was on board to compare different types of filtration for HPLC analyses. During the diving day, the underwater ARGOS beacons were brought back up to the dinghy for maintenance.

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 buoy data retrieval and for completing the transect and the second day for diving operations.

Tuesday 13 September 2011

The first day, the sea was calm with a light breeze. The visibility was good with a blue sky. When arrived at the BOUSSOLE site, 6 C-OPS profiles, 1 CTD cast with water sampling and 1 Secchi disk were performed. A CISCO connection with the buoy was established for data retrieval. Then the CTD transect was performed.

Wednesday 14 September 2011

The second day, the sea was calm with a light breeze. The sky was blue with a good visibility. When arrived at the BOUSSOLE site, divers went at sea to clean buoy instruments. The underwater ARGOS beacons were brought back up to the dinghy for maintenance and tests and were put back on the buoy at the end of the diving. Divers also put 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. Then, 6 C-OPS profiles, 2 CTD cast with water sampling and 1 Secchi disk were performed.

Thursday 15 September 2011

The last day, the sea was smooth with a light breeze, a blue sky and a good visibility. When on site, 2 CTD cast with water sampling, 7 C-OPS profiles and 1 Secchi disk were performed.

Cruise Report

Tuesday 13 September 2011 (UTC)

People on board: Frédéric Bailleul, Emilie Diamond and Vincent Taillandier.

0510 Departure from the Nice harbour.
0830 Arrival at the BOUSSOLE site.
0830 C-OPS 01, 02, 03.
0925 CTD 01: no AC9 connection because of a wrong configuration.
0955 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.
1045 Filtrations.
1115 CISCO connection with the buoy and data retrieval.
1135 Secchi disk 01 (25 m).
1140 C-OPS 04, 05, 06.
1230 Departure to the first transect station.
1300 CTD 02, 400 m, station 01 (43°25'N 07°48'E).
1400 CTD 03, 400 m, station 02 (43°28'N 07°42'E).
1455 CTD 04, 400 m, station 03 (43°31'N 07°37'E).
1550 CTD 05, 400 m, station 04 (43°34'N 07°31'E).
1645 CTD 06, 400 m, station 05 (43°37'N 07°25'E).
1735 CTD 07, 400 m, station 06 (43°39'N 07°21'E).
1805 Departure to the Nice harbour.
1835 Arrival at the Nice harbour.

Wednesday 14 September 2011 (UTC)

People on board: Frédéric Bailleul, Emilie Diamond, Vincent Taillandier and 3 divers.

0505 Departure from the Nice harbour.
0815 Arrival at the BOUSSOLE site.
0820 Diving on the buoy for cleaning instruments. Underwater ARGOS beacons brought back up to the dinghy for maintenance and tests and put back on the buoy at the end of the diving. Dark HS4 and transmissometers measurements at 09:00, 09:15, 09:30 and 09:45.
0845 Cleaning of solar panels, sensors and ARGOS and CISCO connectors on the head of the buoy.
1000 C-OPS 07, 08, 09.
1100 CTD 08, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC and a_p .
1200 C-OPS 10, 11, 12.
1250 CTD 09, 400 m with water sampling at 400, 200, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for TSM and CDOM.
1305 Secchi disk 02 (28 m).
1320 Departure to the Nice harbour.
1630 Arrival at the Nice harbour.

Thursday 15 September 2011 (UTC)

People on board: Frédéric Bailleul, Emilie Diamond, Mustapha Ouhssain and Vincent Taillandier.

0435 Departure from the Nice harbour.
0750 Arrival at the BOUSSOLE site.
0755 CTD 10, 400 m with water sampling at 45 m for HPLC tests.
0840 C-OPS 13, 14: incomplete because of clouds.

0915 Secchi disk 03 (25 m).
0925 C-OPS 15, 16, 17.
1010 C-OPS 18, 19, 20.
1100 CTD 11, 400 m with water sampling at 45 and 5 m for HPLC tests.
1135 Departure to the Villefranche Bay.
1435 Dinghy unloading in the Villefranche Bay.
1500 Arrival at the Nice harbour.

Problems identified during the cruise

- On the carousel, the bottle #2 lock system did not work so the AC9 was at this place (position #2) instead of position #12.
- The configuration of the AC9 was not good (changed during the last data retrieval) so it was changed just before the first CTD cast.
- During this cruise, data from the CDOM fluorometer were apparently corrupted in the down casts except for CTD 06 and CTD 07.

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

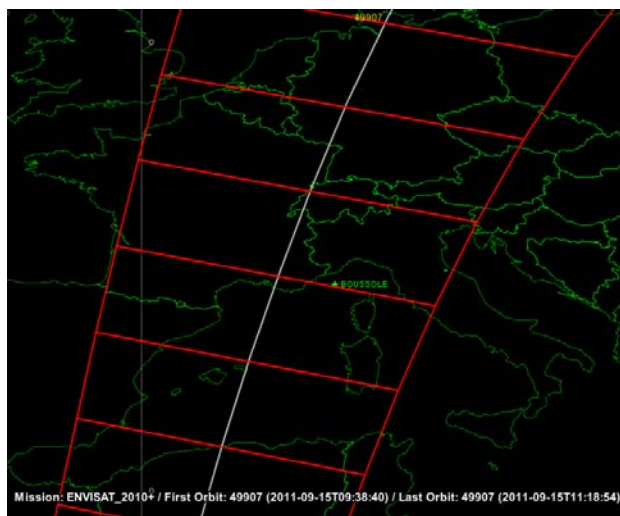
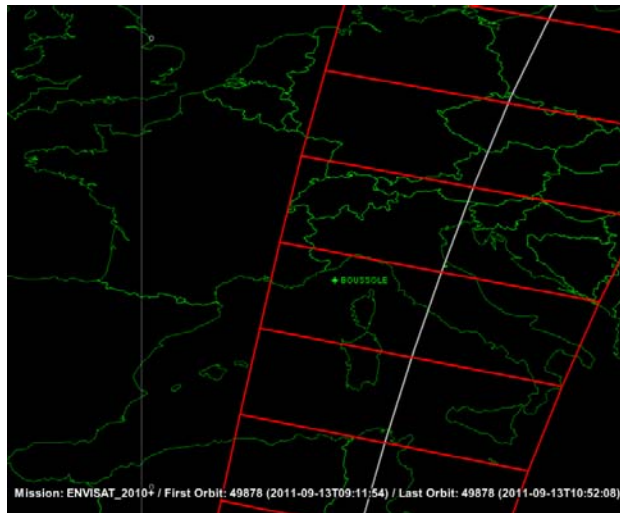


Figure 1. Calculated swath path for MERIS (Esov NG software) above the BOUSSOLE site for the 13th and 15th of September 2011.

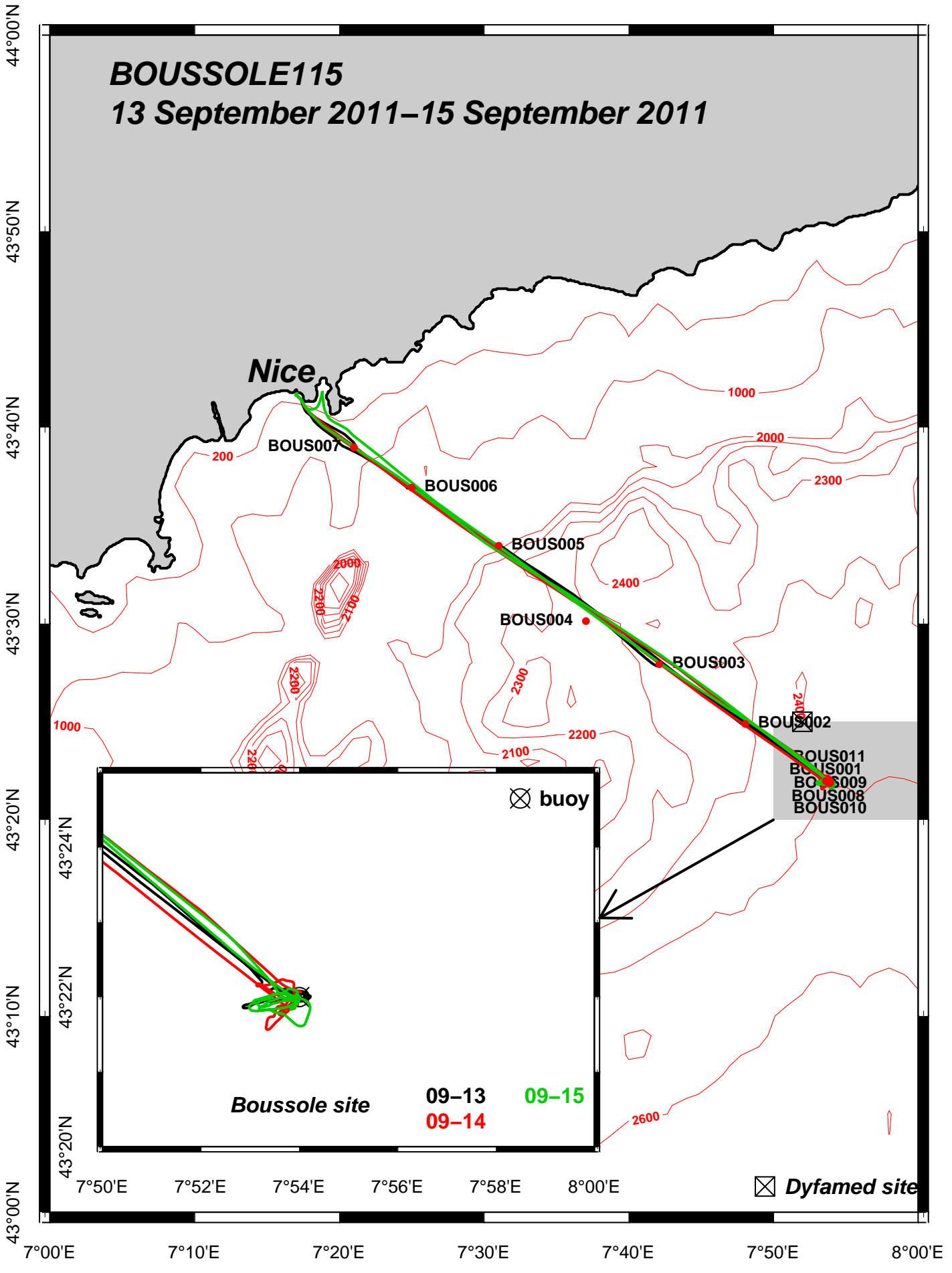
Appendices

Cruise Summary Table for Boussole 115

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)	(Minute)				Wind sp. (kn)	Wind dir.										
13/09/11	bou_c-ops_110913_0828_001_data.csv				08:29	1:13																				
	bou_c-ops_110913_0828_003_data.csv				8:39	5:07	100.5	43	22:028	7	53.500	blue	None	0	3	110	1016.1	81	good	23.8		calm	0.3		no	
	bou_c-ops_110913_0828_004_data.csv				8:53	4:16	87.2	43	21:967	7	53.296	blue	None	0	3	110	1016.1	81	good	23.8		calm	0.3		no	
	bou_c-ops_110913_0828_005_data.csv				09:05	3:56	79.2	43	21:880	7	53.009	blue	None	0	3	110	1016.1	81	good	23.8		calm	0.3		no	
	bou_c-ops_110913_0828_006_data.csv				09:20	1:18																				
			CTDBOUS001	HPLC, Ap & TSM Secchi01	09:59	31:00	400	43	21:979	7	53.62	blue			0	4	112	1016	73		25.3	23.3	calm			no
					11:35	4:00	25	43	22	7	54	blue			0					good			calm			no
	bou_c-ops_110913_1144_001_data.csv				11:45	1:11																				
	bou_c-ops_110913_1144_002_data.csv				11:52	3:43	72.7	43	22:071	7	53.820	blue	None	0	3	143	1015.3	75	good	24.6		calm	0.3		no	
	bou_c-ops_110913_1144_003_data.csv				12:05	3:42	74.7	43	22:117	7	53.480	blue	None	0	3	143	1015.3	75	good	24.6		calm	0.3		no	
	bou_c-ops_110913_1144_004_data.csv				12:18	3:35	70.6	43	22:155	7	53.240	blue	None	0	3	143	1015.3	75	good	24.6		calm	0.3		no	
	bou_c-ops_110913_1144_006_data.csv				12:46	1:20																				
			CTDBOUS002		13:03	22:00	400	43	24:885	7	48.060	blue			0	2	99	1014.8	72		25.3	23.2	calm			no
			CTDBOUS003		14:04	21:00	400	43	27:929	7	42.116	blue			0	3	80	1014	71		24.9	23.7	calm			no
		CTDBOUS004		14:58	22:00	400	43	30.129	7	37.048	blue			0	5	75	1014	71		25.3	23.5	calm			no	
		CTDBOUS005		15:54	22:00	400	43	33.970	7	31.020	blue			1	4	30	1014	61		25.4	24.8	calm			no	
		CTDBOUS006		16:48	24:00	400	43	36.933	7	25.007	blue			1	4	86	1014	64		25.6	25.7	calm			no	
		CTDBOUS007		17:40	22:00	400	43	38.950	7	21.020	blue			2	5	150	1014	74		25.0	25.4	calm			no	
14/09/2011	bou_c-ops_110914_1000_001_data.csv				10:03	1:13																				
	bou_c-ops_110914_1000_002_data.csv				10:18	4:01	79.7	43	21.958	7	53.801	blue	Cu	2	3	322	1015.5	75	good	23.8		calm	0.1		no	
	bou_c-ops_110914_1000_003_data.csv				10:32	3:58	80.9	43	21.850	7	53.533	blue	Cu	2	3	322	1015.5	75	good	23.8		calm	0.1		no	
	bou_c-ops_110914_1000_004_data.csv				10:44	3:32	71.1	43	21.716	7	53.369	blue	Cu	2	3	322	1015.5	75	good	23.8		calm	0.1		no	
	bou_c-ops_110914_1000_005_data.csv				10:59	1:54																				
			CTDBOUS008	HPLC & Ap	11:18	38:00	400	43	21.887	7	53.787	blue			1	3	324	1015	78		23.6	23.4	calm			no
	bou_c-ops_110914_1158_001_data.csv				12:02	2:22																				
	bou_c-ops_110914_1158_002_data.csv				12:09	4:03	82.2	43	22.207	7	53.845	blue	None	0	3	222	1015.0	74	good	25.0		calm	0.3		no	
	bou_c-ops_110914_1158_003_data.csv				12:22	3:58	80.8	43	22.222	7	53.596	blue	None	0	3	222	1015.0	74	good	25.0		calm	0.3		no	
	bou_c-ops_110914_1158_004_data.csv				12:34	3:52	77.6	43	22.157	7	53.316	blue	None	0	3	222	1015.0	74	good	25.0		calm	0.3		no	
bou_c-ops_110914_1158_005_data.csv				12:47	1:09																					
		CTDBOUS009	TSM & CDOM Secchi02	12:55	26:00	400	43	21.929	7	53.928	blue			2	4	66	1015	75		23.5	24.3	calm			no	
				13:05	4:00	28	43	22	7	54	blue			2					good			calm			no	
15/09/11			CTDBOUS010	HPLC	08:04	27:00	400	43	21.872	7	53.919	blue			3	2	64	1014	80		23.9	23.7	calm			no
	bou_c-ops_110915_0801_001_data.csv				08:05	1:19																				
	bou_c-ops_110915_0801_002_data.csv				08:48	3:09	63.6	43	21.986	7	53.689	blue	Cu & St	4	3	157	1016.9	81	good	23.3		calm	0.2		no	
	bou_c-ops_110915_0801_003_data.csv				09:01	1:01	16.9	43	21.934	7	53.370	blue	Cu & St	4	3	157	1016.9	81	good	23.3		calm	0.2		no	
				Secchi03	09:15	4:00	25	43	22	7	54	blue			1					good			calm			no
	bou_c-ops_110915_0801_004_data.csv				09:31	3:59	80.4	43	22.096	7	53.734	blue	Ci	1	3	304	1017.0	78	good	23.8		calm	0.3		no	
	bou_c-ops_110915_0801_005_data.csv				09:43	3:43	75.5	43	22.041	7	53.498	blue	Ci	1	3	304	1017.0	78	good	23.8		calm	0.3		no	
	bou_c-ops_110915_0801_006_data.csv				09:55	3:06	61.8	43	21.954	7	53.231	blue	Ci	1	3	304	1017.0	78	good	23.8		calm	0.3		no	
	bou_c-ops_110915_0801_007_data.csv				10:16	3:35	71.9	43	21.950	7	53.811	blue	Ci	1	4	305	1017.1	76	good	24.2		calm	0.3		no	
	bou_c-ops_110915_0801_008_data.csv				10:27	3:53	78.6	43	21.919	7	53.491	blue	Ci	1	4	305	1017.1	76	good	24.2		calm	0.3		no	
	bou_c-ops_110915_0801_009_data.csv				10:39	3:41	74.6	43	21.885	7	53.177	blue	Ci	1	4	305	1017.1	76	good	24.2		calm	0.3		no	
	bou_c-ops_110915_0801_010_data.csv				10:57	1:13																				
			CTDBOUS011	HPLC	11:08	25:00	400	43	21.996	7	53.895	blue			0	3	307	1017	79		23.8	23.7	calm			no

BOUSSOLE115

13 September 2011–15 September 2011

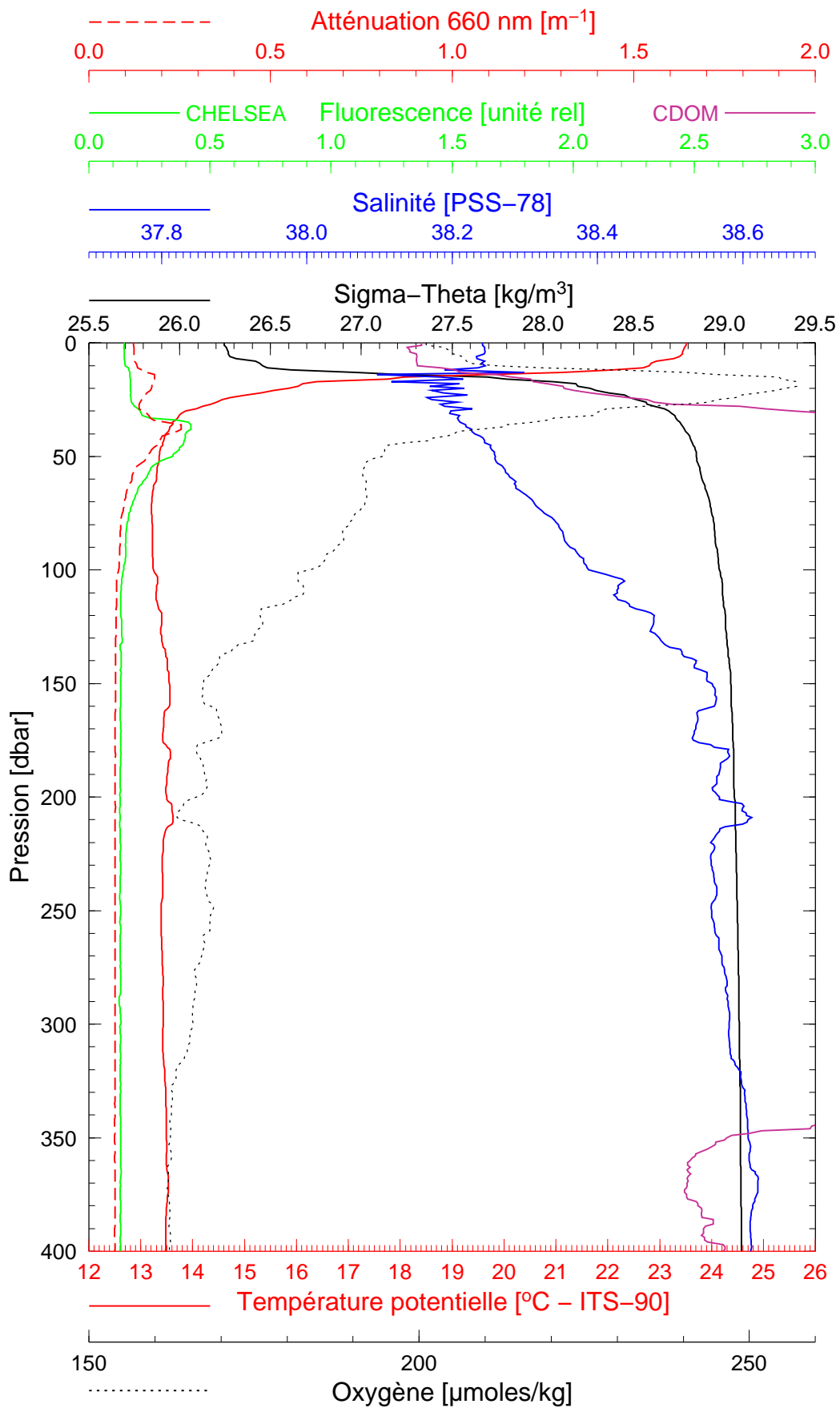


BOUSSOLE 115

13/09/2011

BOUS110913_01

BOUS001



Date 13/09/2011
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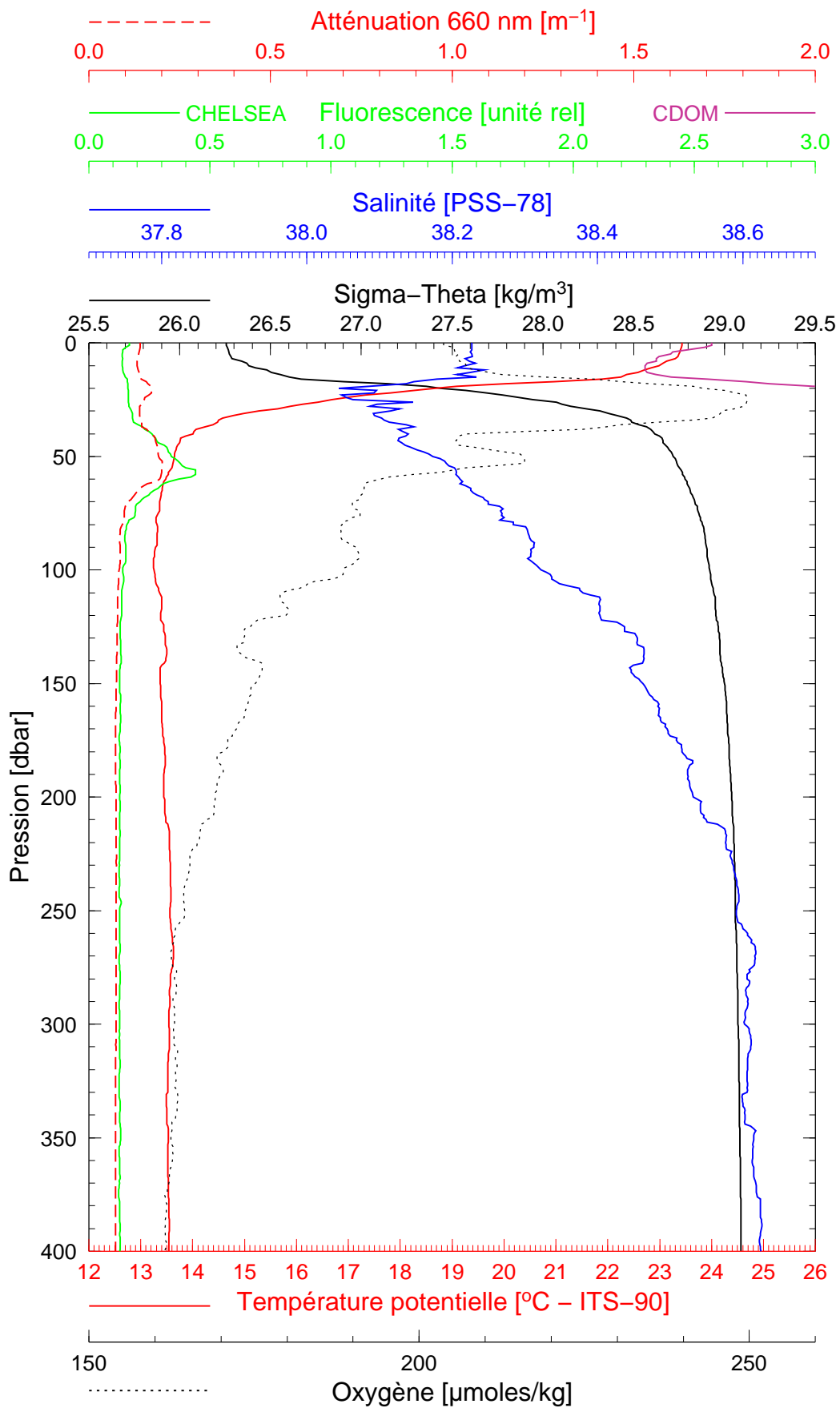
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BOUSSOLE 115

13/09/2011

BOUS110913_02

BOUS002



Date 13/09/2011

Latitude 43°24.885 N

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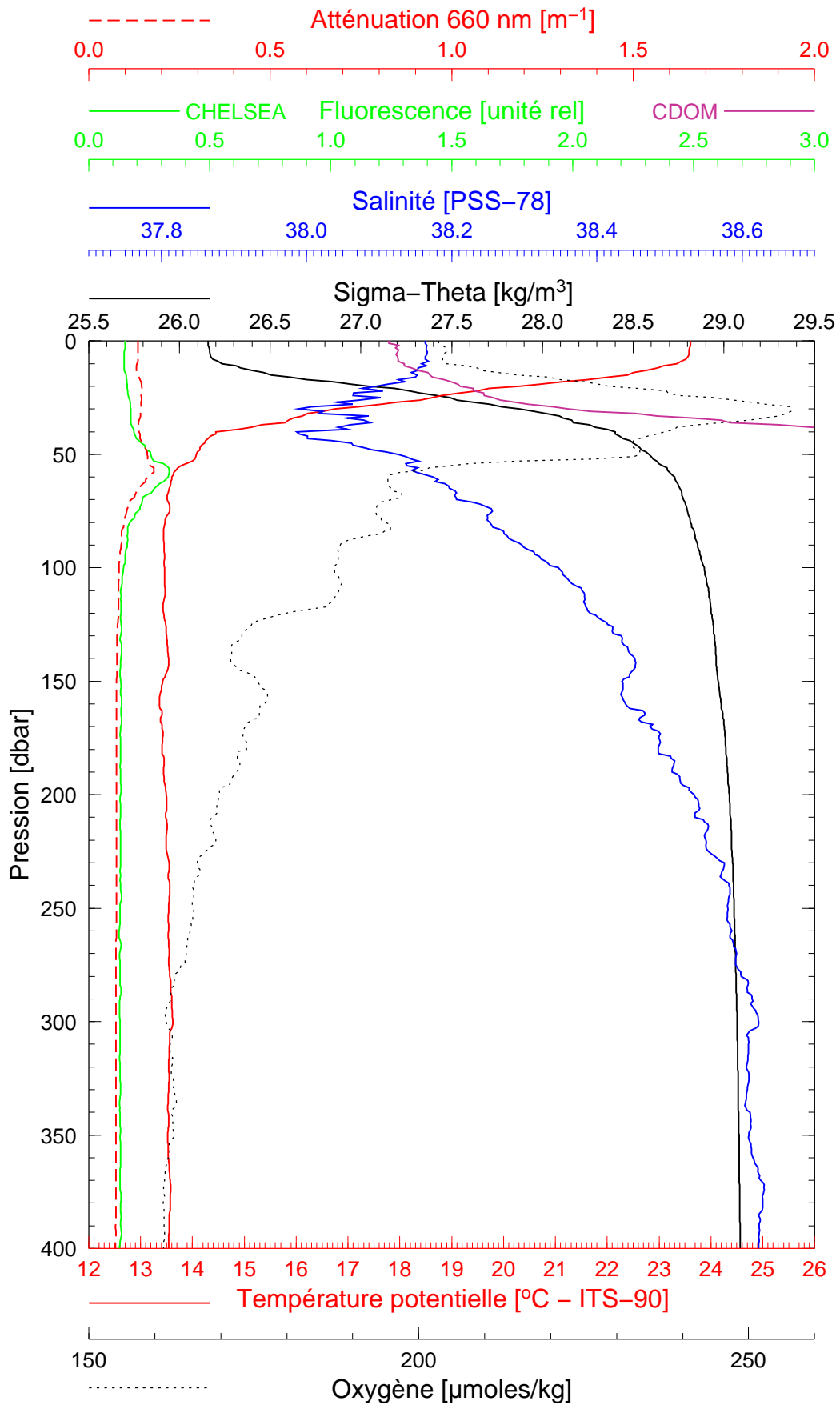
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BOUSSOLE 115

13/09/2011

BOUS110913_03

BOUS003



Date 13/09/2011

Latitude 43°27.929 N

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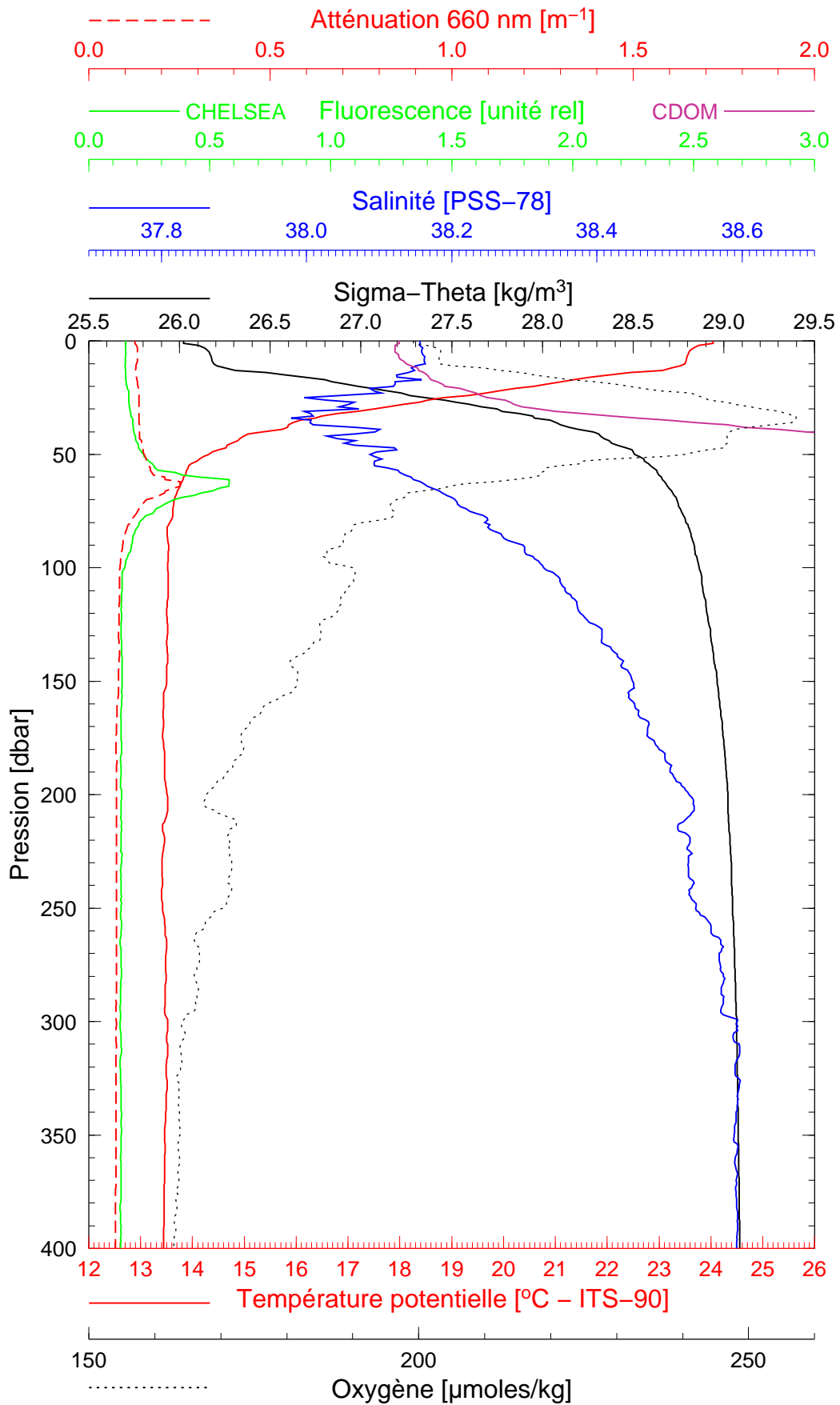
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BOUSSOLE 115

13/09/2011

BOUS110913_04

BOUS004



Date 13/09/2011

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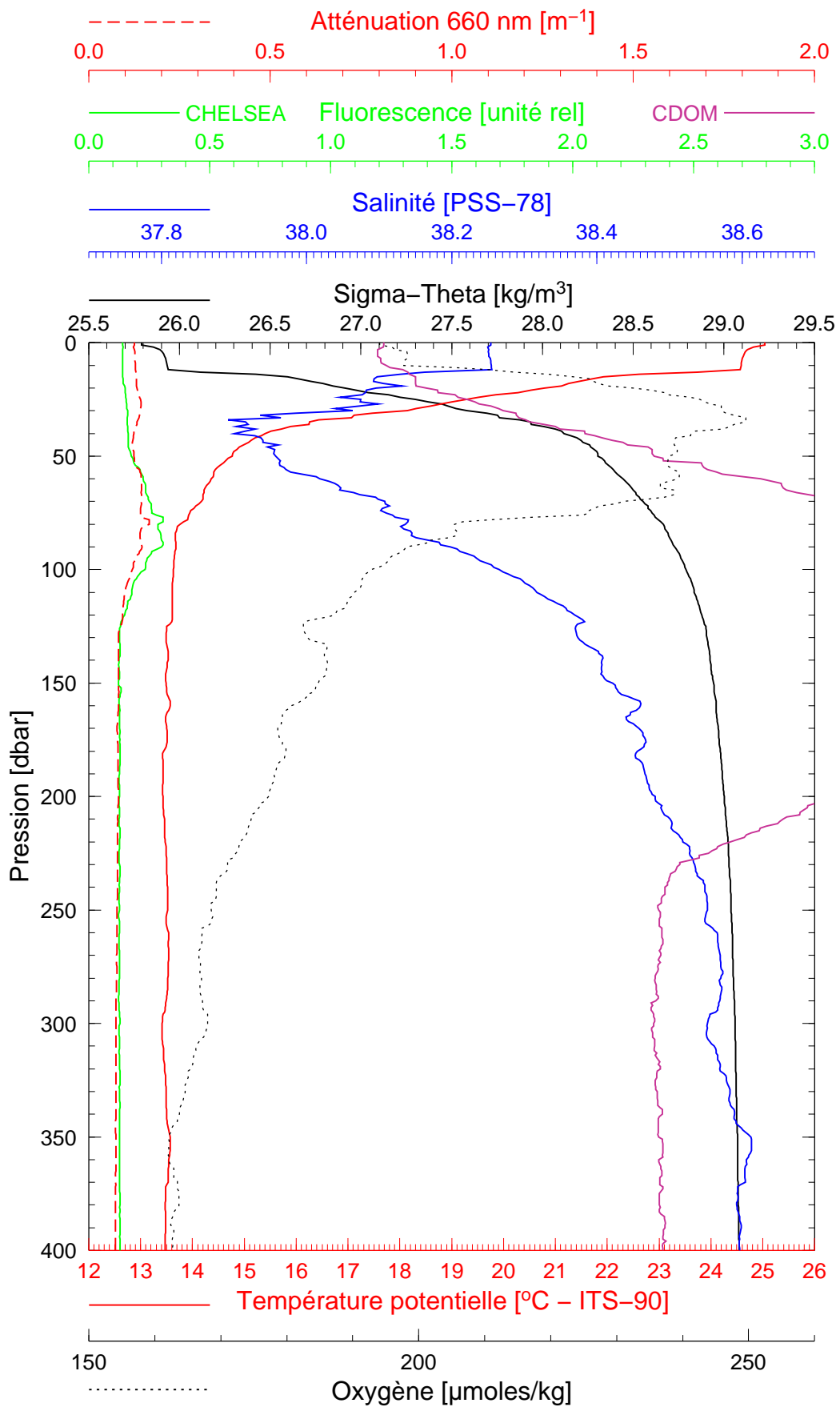
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BOUSSOLE 115

13/09/2011

BOUS110913_05

BOUS005



Date 13/09/2011
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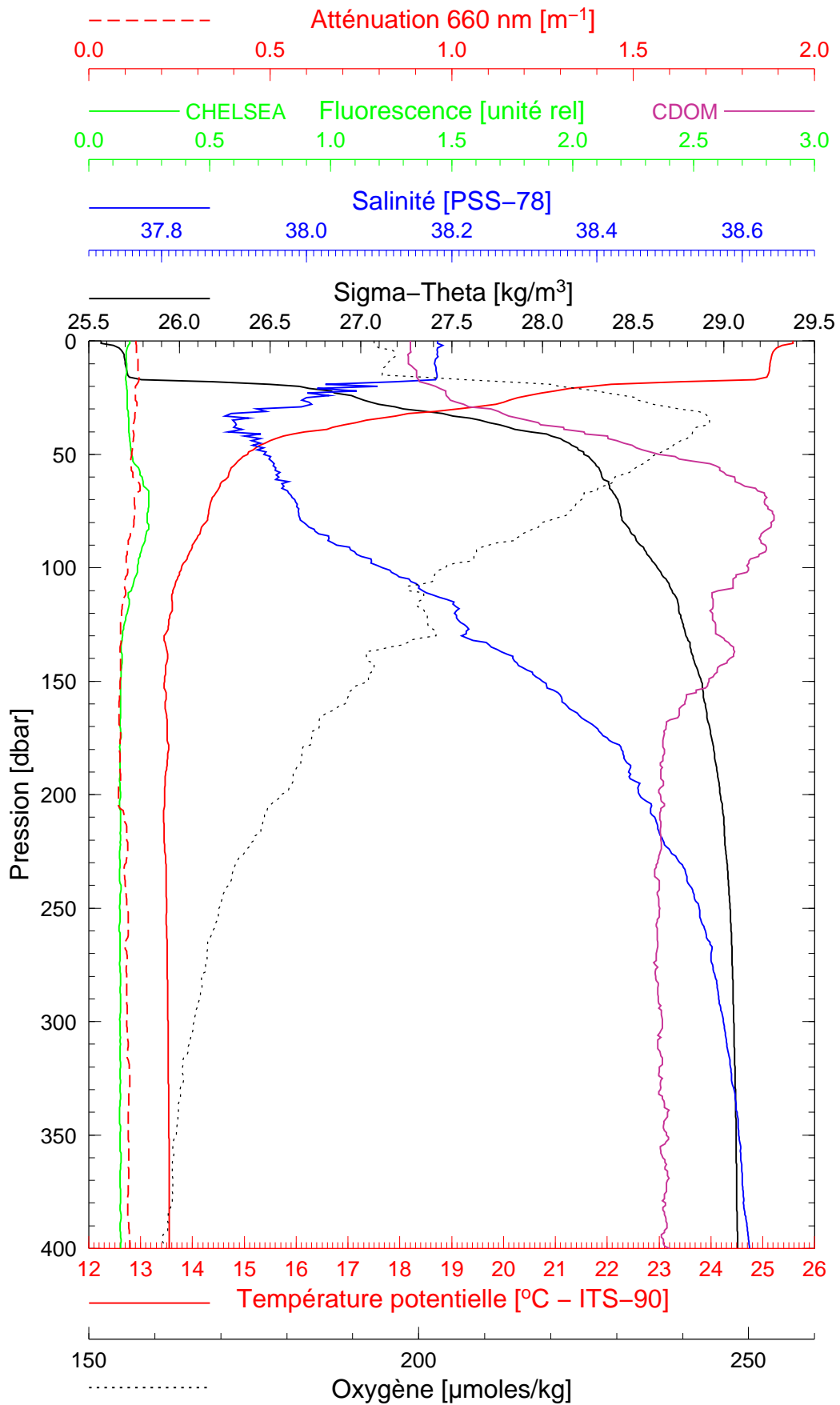
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BOUSSOLE 115

13/09/2011

BOUS110913_06

BOUS006



Date 13/09/2011
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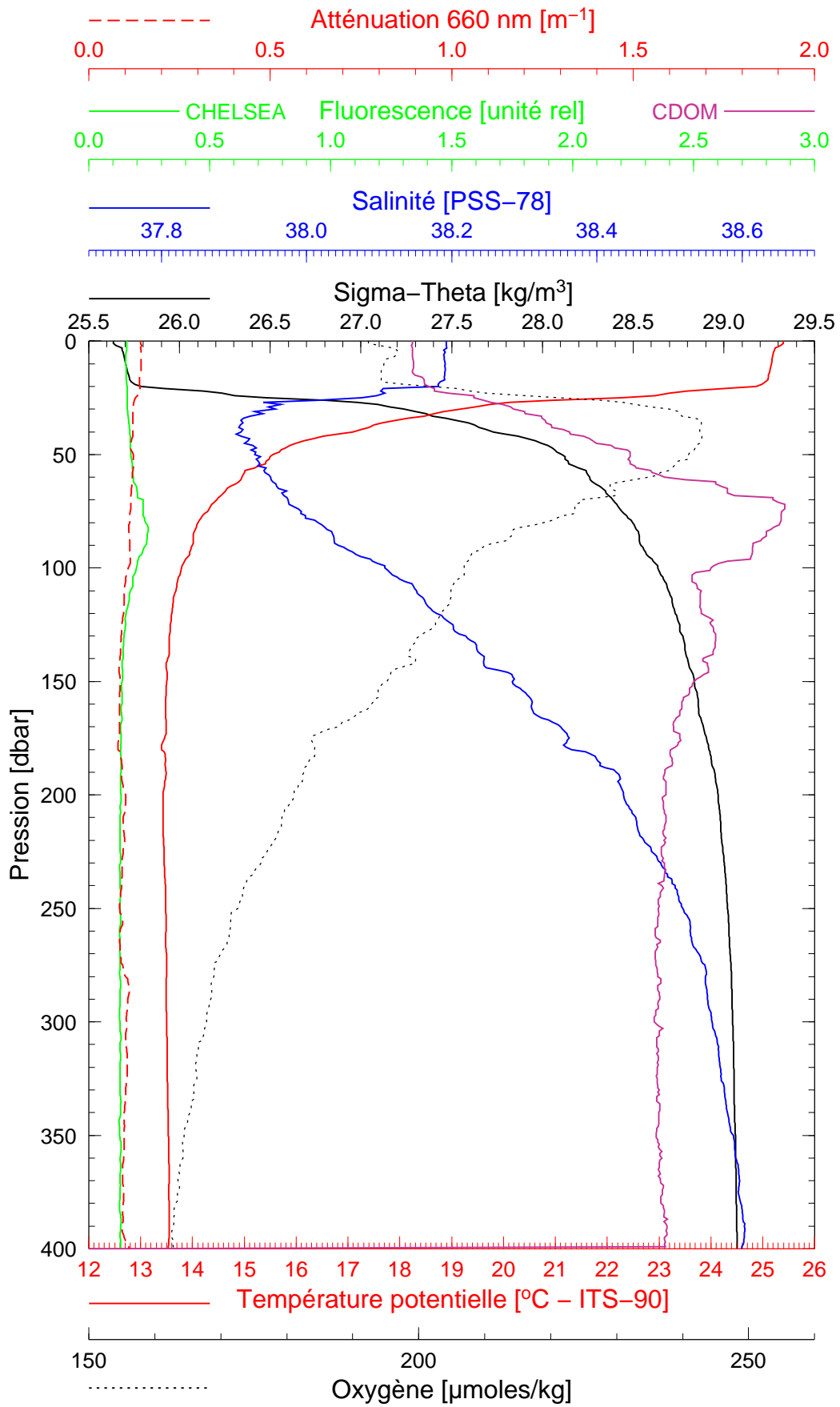
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BOUSSOLE 115

13/09/2011

BOUS110913_07

BOUS007



Date 13/09/2011
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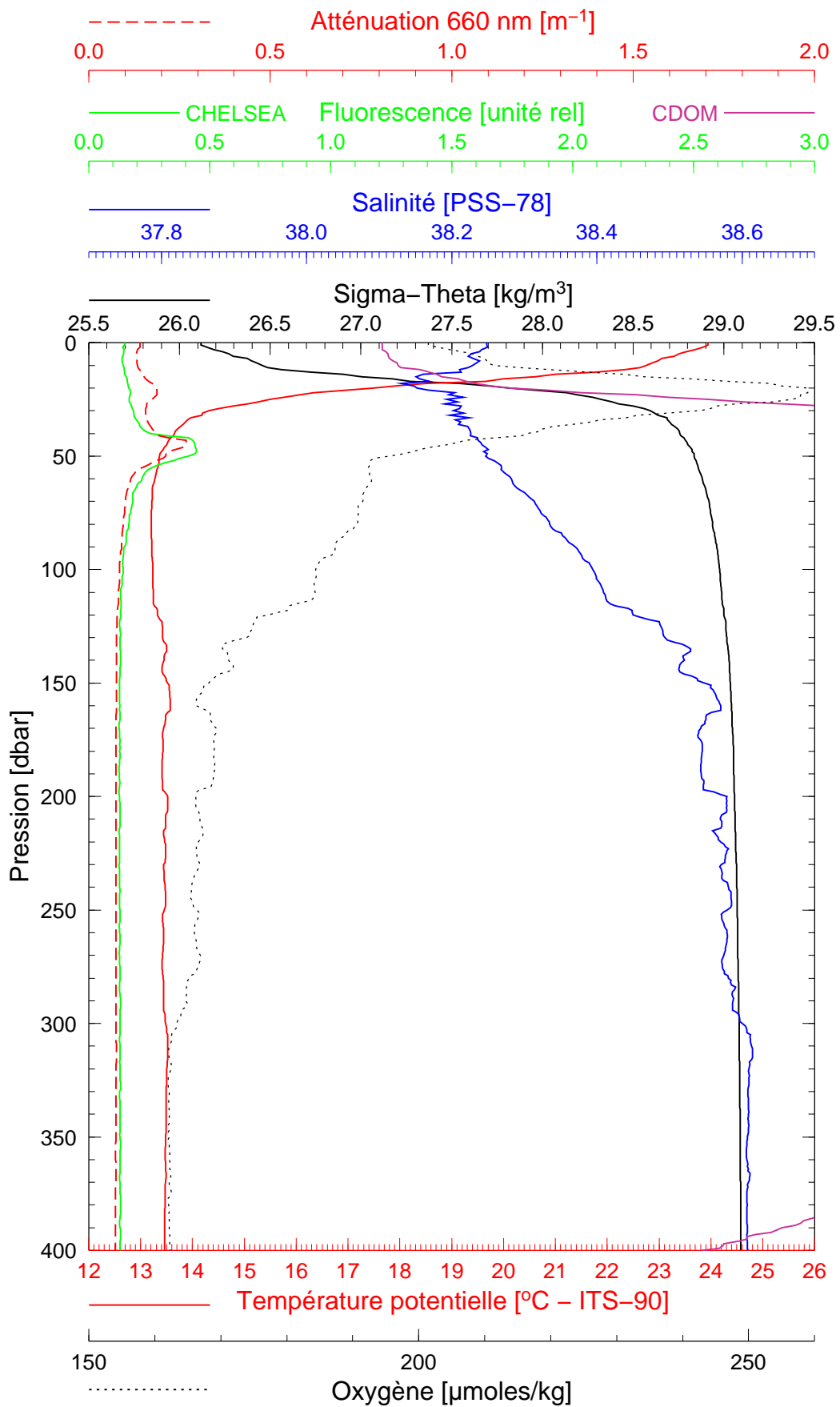
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BOUSSOLE 115

14/09/2011

BOUS110914_01

BOUS008



Date 14/09/2011
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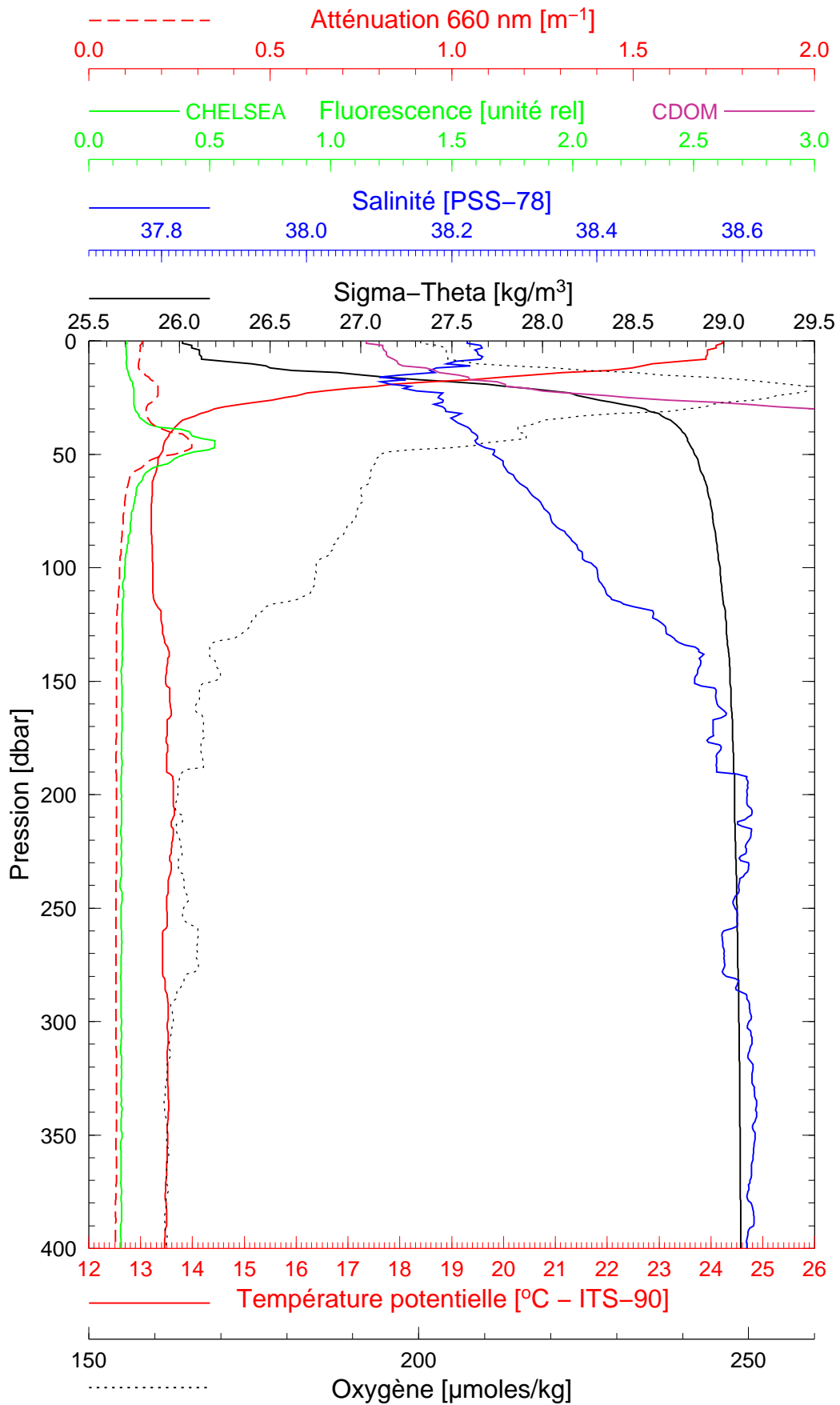
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BOUSSOLE 115

14/09/2011

BOUS110914_02

BOUS009



Date 14/09/2011

Latitude 43°21.929 N

Heure déb 12h 55min [TU]

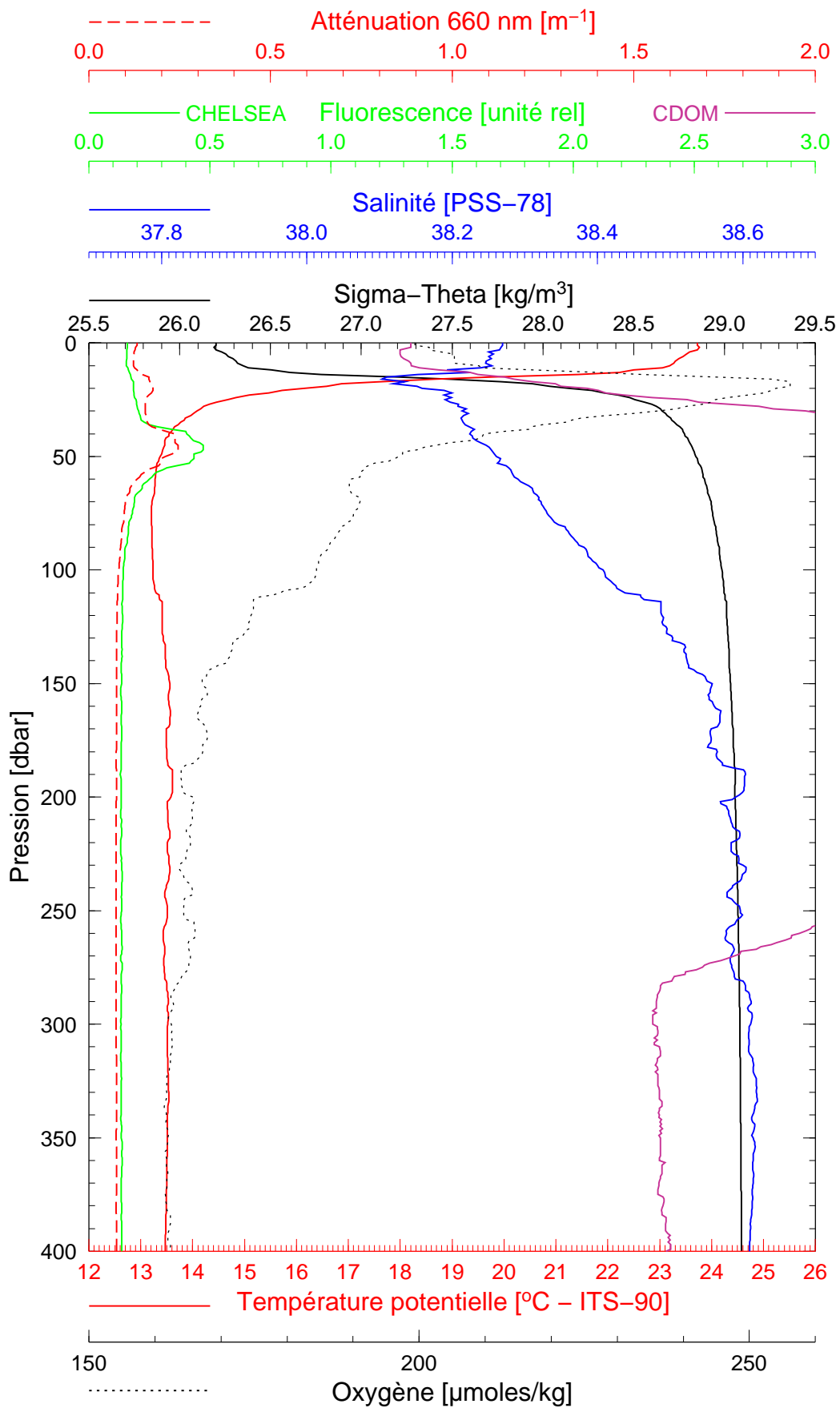
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BOUSSOLE 115

15/09/2011

BOUS110915_01

BOUS010



Date 15/09/2011
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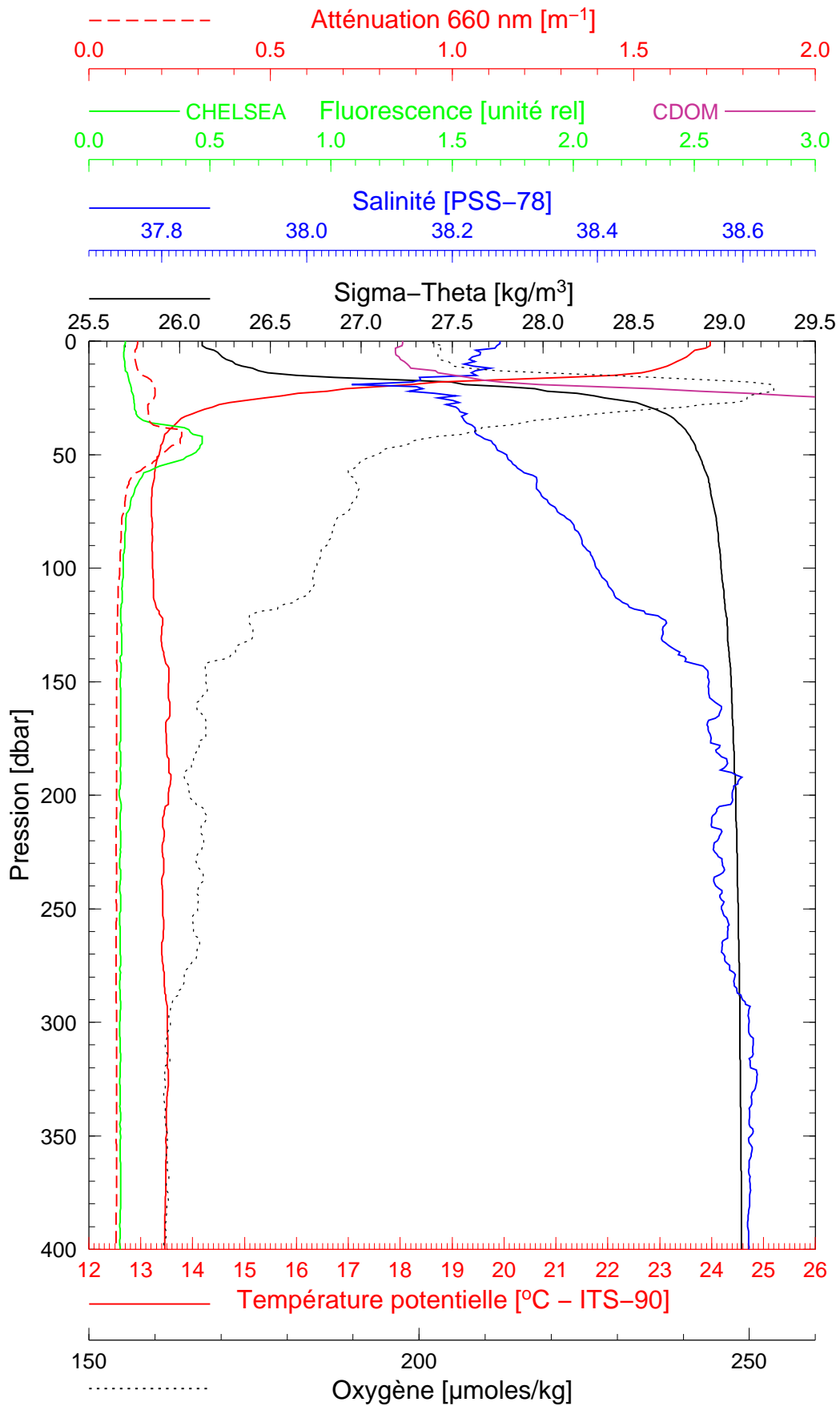
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BOUSSOLE 115

15/09/2011

BOUS110915_02

BOUS011



Date 15/09/2011

Latitude 43°21.996 N

Heure déb 11h 08min [TU]

Longitude 07°53.895 E