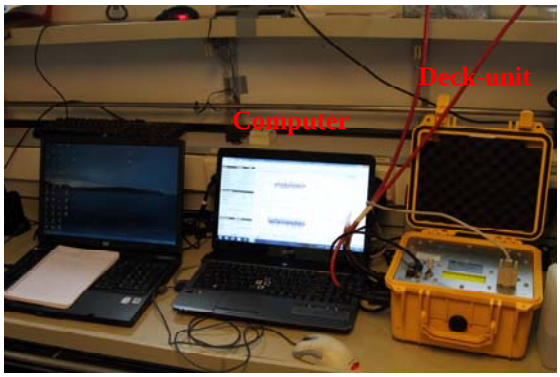
BOUSSOLE Monthly Cruise Report

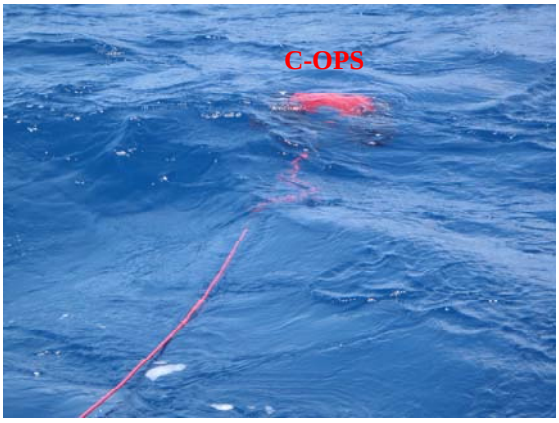
Cruise 111
May 18 - 20, 2011

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

Science Personnel: Guislain Bécu, Emilie Diamond, Matthieu Jasek, Yves Lamblard, David Luquet, Claudie Marec, Grigor Obolensky, Martina Sailerovà, Vincenzo Vellucci and Pierre (diver).

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





Guislain Bécu, one of the previous BOUSSOLE duty chiefs, was on board to see how to use the C-OPS.

BOUSSOLE project

ESA/ESRIN contract N° 13226/10/I-NB

May 29, 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

Contents

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 N_2 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.

Additional operations

The ARGOS beacon on the head of the buoy stopped to transmit data from the 8th of May so its connector has been cleaned. The last day, Martina Sailerova was on board to complete the MOOSE program with a CTD cast and water sampling.

Cruise Summary

All of the three cruise days were used during this mission 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.

Wednesday 18 May 2011

The first day, the sea was smooth with a light breeze, some clouds and a good visibility. When on site, 1 CTD cast with water sampling was performed. ARGOS and CISCO connectors on the top of the buoy were cleaned and a direct connection with the buoy was established for data retrieval. After balance tests, 1 C-OPS profile was performed and also 1 Secchi disk. Then, the CTD transect was completed.

Thursday 19 May 2011

The second day, the sea was smooth with a moderate breeze, a blue sky and a good visibility. When arrived at the BOUSSOLE site, divers went at sea to take off the LISST-100X for data retrieval and to clean buoy instruments. They also put neoprene caps on the HS4 and on the transmissometers for acquiring four dark measurements. When data retrieval was finished, divers put back the LISST on the buoy. Then, 6 C-OPS profiles, 3 CIMEL measurements, 1 CTD cast with water sampling and 1 Secchi disk were performed before leaving.

Friday 20 May 2011

The last day, the sea was slight with a moderate breeze, a blue sky and a good visibility. When arrived at the BOUSSOLE site, 6 C-OPS profiles and 1 CTD cast with water sampling were performed for BOUSSOLE. During the lunch time, Martina Sailerova completed the MOOSE program with a deep CTD cast and water sampling.

Cruise Report

Wednesday 18 May 2011 (UTC)

People on board: Guislain Bécu, Emilie Diamond, Matthieu Jasek, Claudie Marec and Grigor Obolensky.

0450 Departure from the Nice harbour.
0810 Arrival at the BOUSSOLE site.
0815 CTD 01, 400 m with water sampling at 400, 200, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p and TSM.
0900 Zodiac at sea for climbing on the buoy. Solar panels, optic sensors and CISCO and ARGOS connections cleaned.
1015 Direct connection with the buoy and data retrieval.
1040 C-OPS: bad pitch during profiles so new balance tests.
1100 Lunch.
1110 Secchi disk 01 (18 m).
1200 C-OPS balance tests.
1235 C-OPS 01.
1305 Departure to the first transect station.
1335 CTD 02, 400 m, station 01 (43°25'N 07°48'E).
1435 CTD 03, 400 m, station 02 (43°28'N 07°42'E).
1535 CTD 04, 400 m, station 03 (43°31'N 07°37'E).
1635 CTD 05, 400 m, station 04 (43°34'N 07°31'E).
1705 Departure to the Nice harbour.
1830 Arrival at the Nice harbour.

Thursday 19 May 2011 (UTC)

People on board: Emilie Diamond, Vincenzo Vellucci and 3 divers.

0500 Departure from the Nice harbour.
0815 Arrival at the BOUSSOLE site.
0830 Diving on the buoy for taking off the LISST-100X for data retrieval, for cleaning instruments and for putting back the LISST on the buoy. Dark HS4 and transmissometers measurements at 09:15, 09:30, 09:45 and 10:00.
0835 CIMEL 01, 02, 03.
0940 Secchi disk 02 (18 m).
1105 C-OPS 02, 03, 04.
1200 CTD 06, 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.
1235 C-OPS 05, 06, 07.
1320 Departure to the Nice harbour.
1645 Arrival at the Nice harbour.

Friday 20 May 2011 (UTC)

People on board: Emilie Diamond, Grigor Obolensky and Martina Sailerova.

0410 Departure from the Nice harbour.
0725 Arrival at the BOUSSOLE site.
0730 CTD 07, 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.
0820 C-OPS 08, 09, 10.
0915 Zodiac at sea for climbing on the buoy. CISCO and ARGOS connections cleaned.
0940 C-OPS 11, 12, 13.

1000 Lunch.
1015 CTD MOOSE, 2000m, with water sampling.
1205 Departure to the Nice harbour.
1510 Arrival at the Nice harbour.

Problems identified during the cruise

- Restrictions from the port authorities: the Zonex 23 was not allowed during this cruise.
- The ARGOS beacon on the head of the buoy stopped to transmit data from the 8th of May so its connector has been cleaned the first day of the cruise and also the last day after another stop of transmission during the night.

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

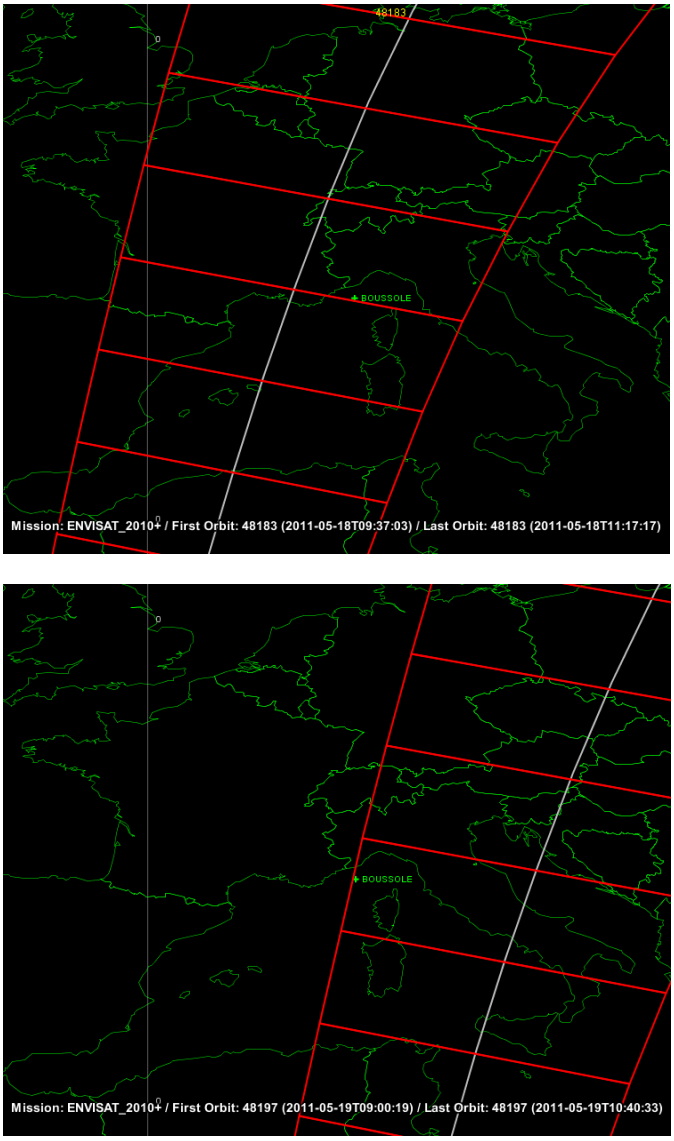
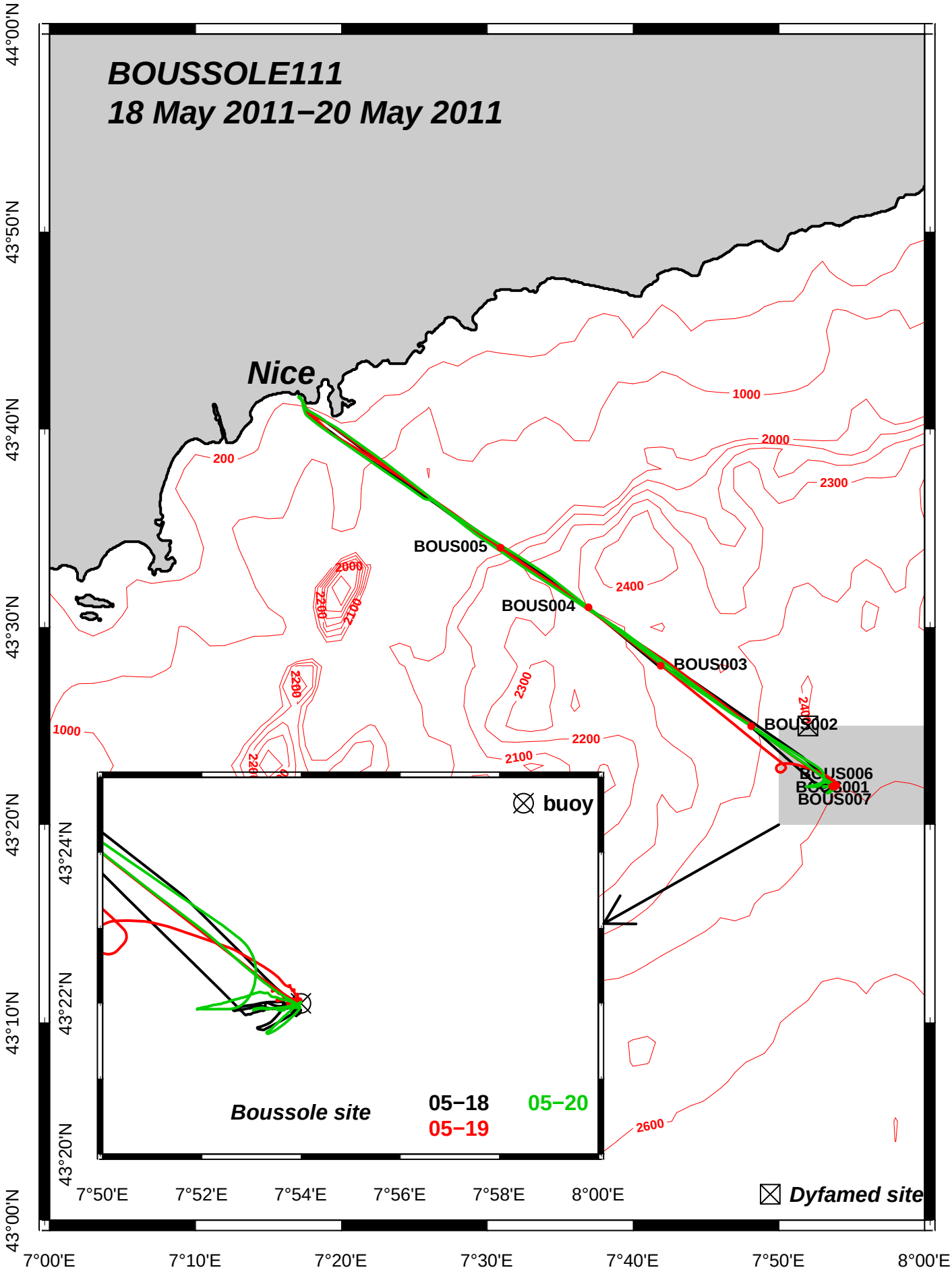


Figure 1. Calculated swath paths for MERIS (Esov NG software) above the BOUSSOLE site for the 18th and 19th of May 2011.

Appendices

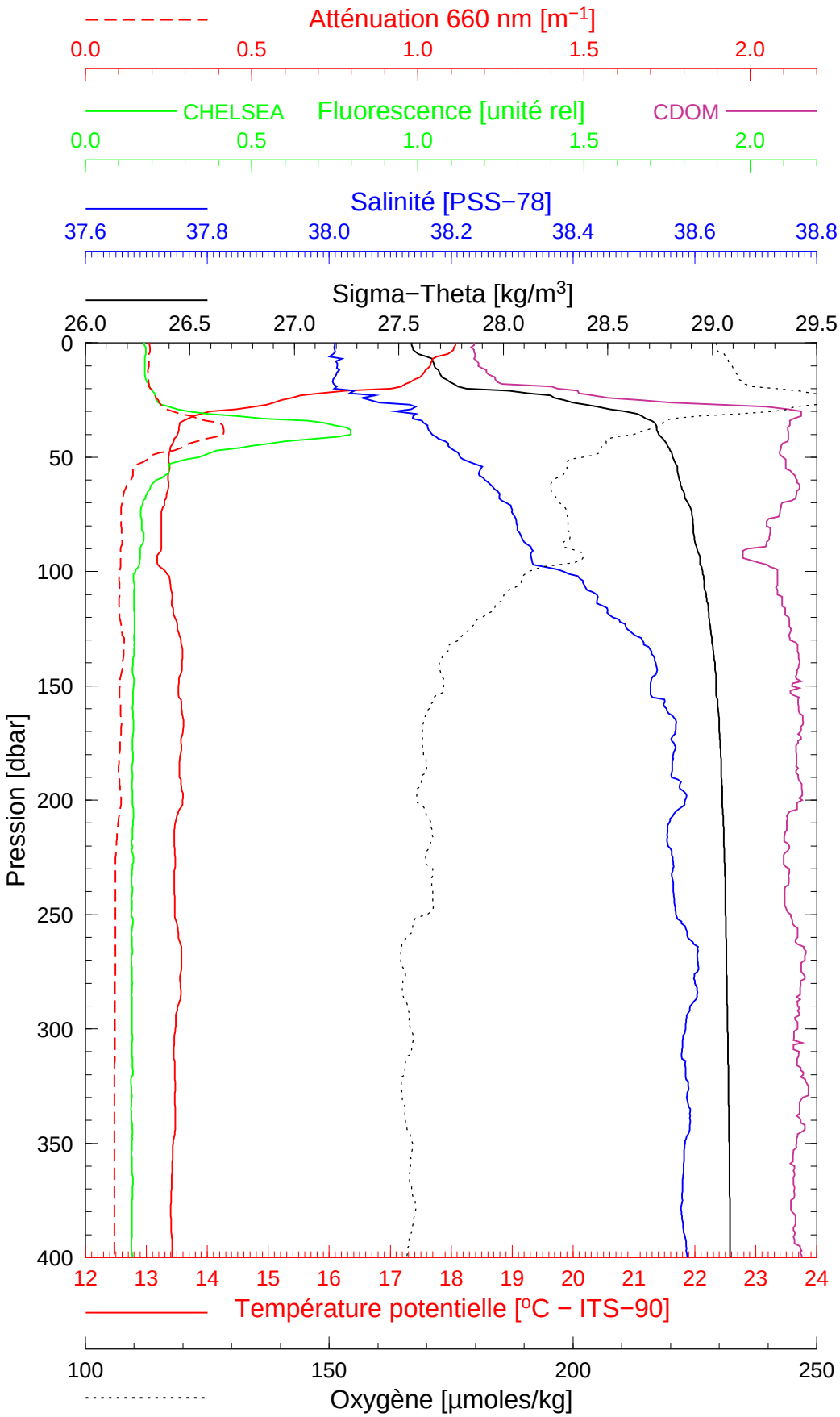
Cruise Summary Table for Boussole 111

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	08:24	37:00	400	43	21.942	7	53.683	hazy		7	8	10	1019.4	85		18.0	18.1	calm			no
				Secchi01	11:10	5:00	18	43	22	7	54	hazy		5					medium			calm			no
	bou_c-ops_110518_0817_001_data.csv				08:18	1:20																			
		bou_c-ops_110518_0817_006_data.csv			12:53	3:57	81.9	43	21.876	7	53.043	blue	Ac&Ci	4	4	241	1018.4	70	good	19.3		calm	0.3		no
18/05/11	bou_c-ops_110518_1400_001_data.csv				14:01	2:08																			
			CTDBOUS002		13:38	26:00	400	43	24.988	7	48.114	blue		4	3	106	1018.1	67		20.5	18.9	calm			no
			CTDBOUS003		14:38	25:00	400	43	28.046	7	41.909	blue		4	6	102	1017.9	71		19.5	18.4	calm			no
			CTDBOUS004		15:35	25:00	400	43	31.000	7	36.952	blue		4	4	82	1017.8	65		20.3	18.8	calm			no
			CTDBOUS005		16:36	26:00	400	43	34.013	7	30.931	overcast		6	7	110	1017.6	67		19.9	19.0	calm			no
				CIMEL01	08:37	10:00		43	22.017	7	53.911	blue		1			1017.5		good						
				CIMEL02	09:02	10:00		43	22.048	7	53.680	blue		1			1017.6		good						
				CIMEL03	09:15	10:00		43	22.033	7	53.527	blue		1			1017.6		good						
				Secchi01	09:40	3:00	18	43	22	7	54	blue		1					good			calm			few
	bou_c-ops_110519_1106_001_data.csv				11:09	1:17																			
		bou_c-ops_110519_1106_003_data.csv			11:16	5:14	110.5	43	22.078	7	53.749	blue	None	0	11	109	1017.7	81	good	19.3		calm	0.4		few
		bou_c-ops_110519_1106_004_data.csv			11:29	3:56	80.6	43	22.121	7	53.611	blue	None	0	11	109	1017.7	81	good	19.3		calm	0.4		few
19/05/11		bou_c-ops_110519_1106_005_data.csv			11:40	3:57	80.3	43	22.169	7	53.508	blue	None	0	11	109	1017.7	81	good	19.3		calm	0.4		few
	bou_c-ops_110519_1106_006_data.csv				12:06	1:21																			
			CTDBOUS006	HPLC, Ap, TSM & CDOM	12:02	30:00	400	43	21.995	7	53.950	blue		0	13	106	1017.7	83		19.4	18.8	calm			yes
	bou_c-ops_110519_1236_001_data.csv				12:37	1:21																			
		bou_c-ops_110519_1236_002_data.csv			12:44	4:48	100.5	43	22.110	7	53.934	blue	None	0	9	112	1017.7	85	good	19.1		calm	0.6		yes
		bou_c-ops_110519_1236_003_data.csv			12:55	4:55	90.4	43	22.172	7	53.864	blue	None	0	9	112	1017.7	85	good	19.1		calm	0.6		yes
		bou_c-ops_110519_1236_004_data.csv			13:07	4:24	80.6	43	22.235	7	53.782	blue	None	0	9	112	1017.7	85	good	19.1		calm	0.6		yes
	bou_c-ops_110519_1236_005_data.csv				13:21	2:16																			
			CTDBOUS007	HPLC, Ap & TSM	07:32	34:00	400	43	21.934	7	53.836	blue		0	14	30	1019.2	79		19.2	18.7	calm			yes
	bou_c-ops_110520_0752_001_data.csv				07:55	1:19																			
		bou_c-ops_110520_0752_002_data.csv			08:24	4:23	90.5	43	21.944	7	53.729	blue	None	0	11	83	1019.5	77	good	19.1		calm	0.6		yes
		bou_c-ops_110520_0752_003_data.csv			08:35	3:16	65.5	43	21.930	7	53.470	blue	None	0	11	83	1019.5	77	good	19.1		calm	0.6		yes
20/05/11		bou_c-ops_110520_0752_004_data.csv			08:46	4:10	81.9	43	21.938	7	53.257	blue	None	0	11	83	1019.5	77	good	19.1		calm	0.6		yes
	bou_c-ops_110520_0752_005_data.csv				09:02	1:19																			
		bou_c-ops_110520_0938_001_data.csv			09:42	5:02	91.5	43	22.030	7	53.770	blue	None	0	13	115	1019.7	77	good	19.2		moved	0.8		yes
		bou_c-ops_110520_0938_002_data.csv			09:54	2:46	53.4	43	22.078	7	53.512	blue	None	0	13	115	1019.7	77	good	19.2		moved	0.8		yes
		bou_c-ops_110520_0938_003_data.csv			10:02	3:02	58.8	43	22.121	7	53.360	blue	None	0	13	115	1019.7	77	good	19.2		moved	0.8		yes
	bou_c-ops_110520_0938_004_data.csv				10:30	1:19																			


BOUSSOLE111
18 May 2011−20 May 2011
Nice
BOUS005
BOUS004
BOUS003
BOUS002
BOUS006
BOUS001
BOUS007
200
1000
2000
2300
2400
2200
2100
2600
buoy
Boussole site
05−18
05−19
05−20
Dyfamed site
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
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 111 **18/05/2011** **BOUS110518_01**

BOUS001

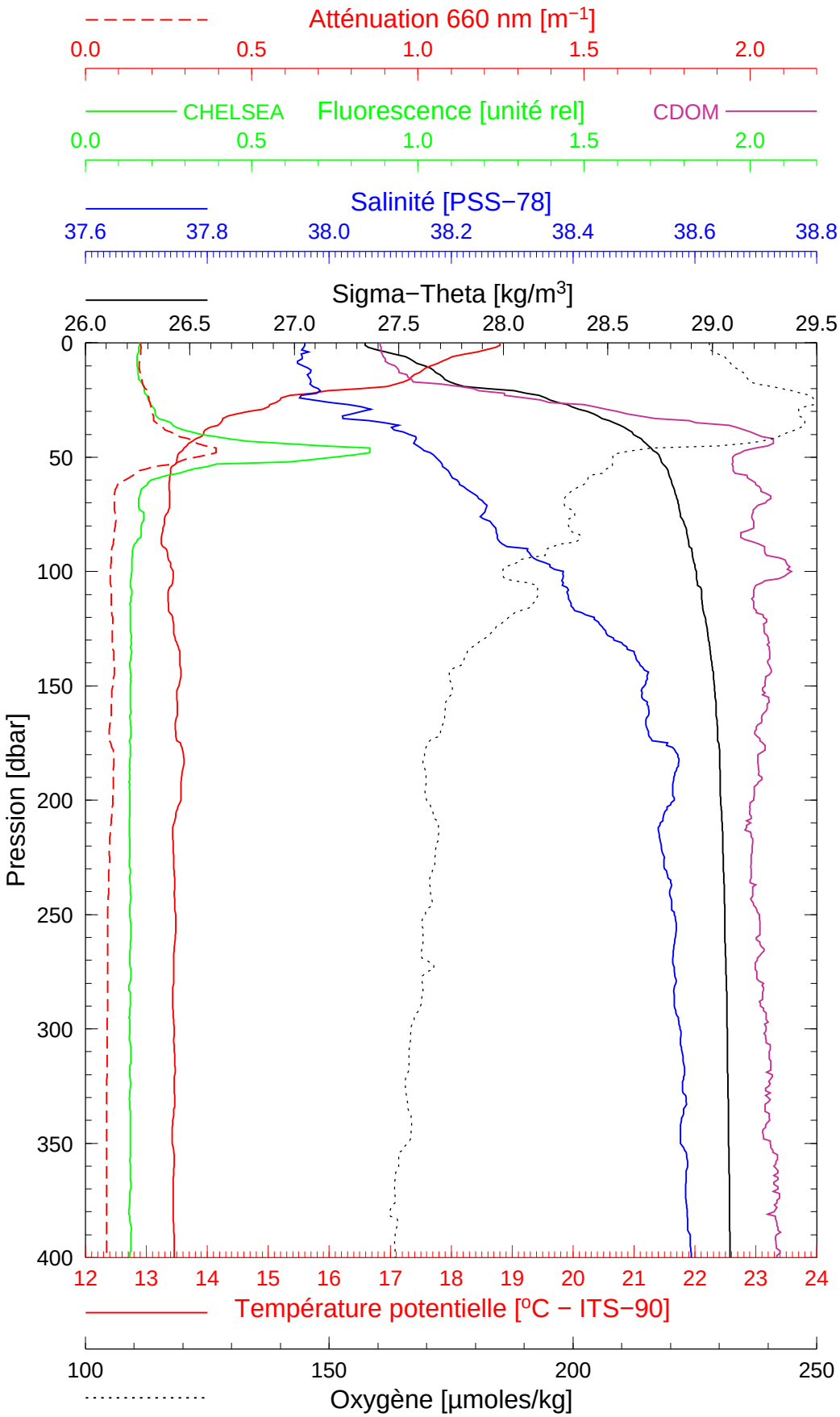


Date *18/05/2011* *Latitude* *43°21.942 N*

Heure déb *08h 24min [TU]* *Longitude* *07°53.683 E*

BOUSSOLE 111 **18/05/2011** **BOUS110518_02**

BOUS002

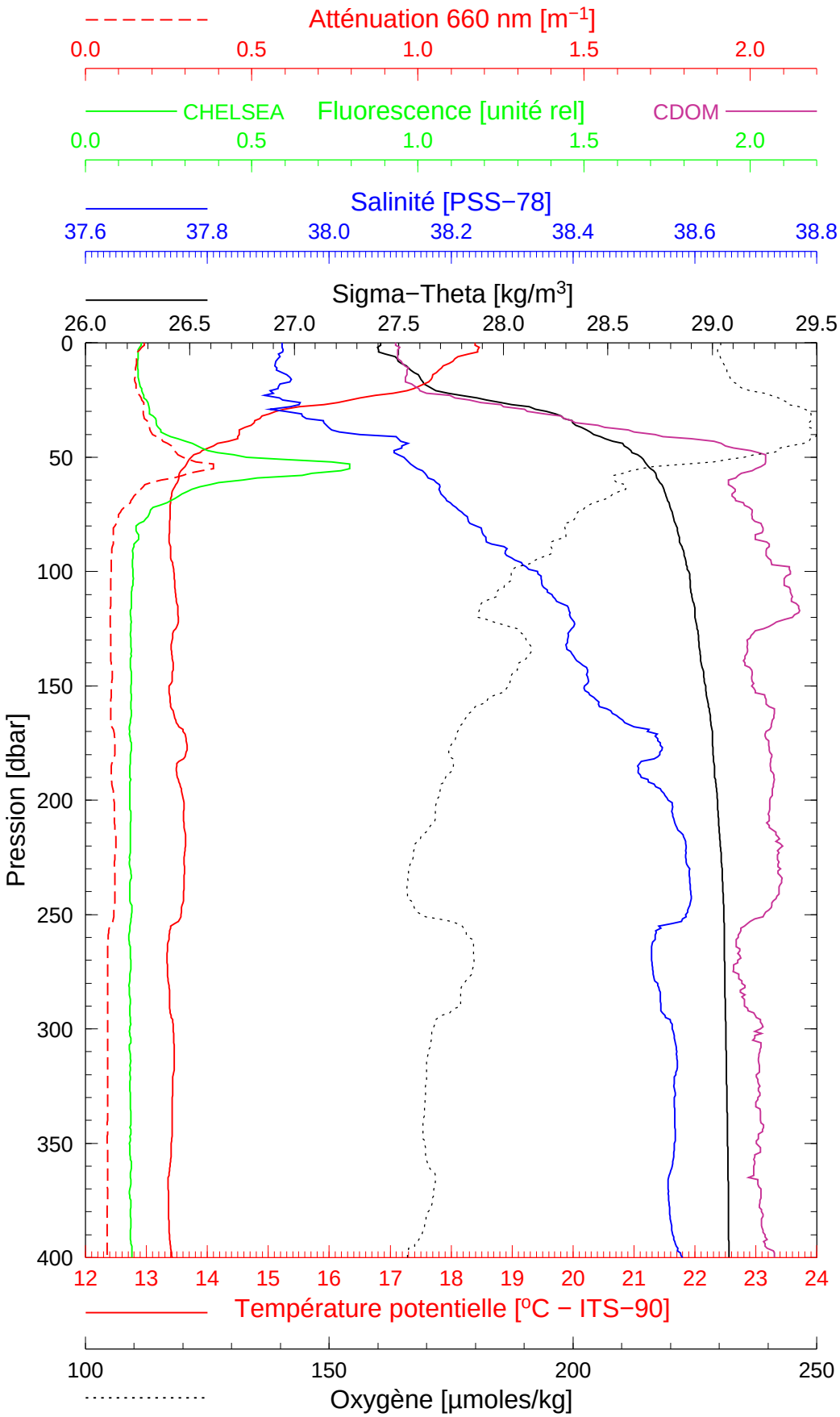


Date *18/05/2011* *Latitude* *43°24.988 N*

Heure déb *13h 38min [TU]* *Longitude* *07°48.114 E*

BOUSSOLE 111 **18/05/2011** **BOUS110518_03**

BOUS003

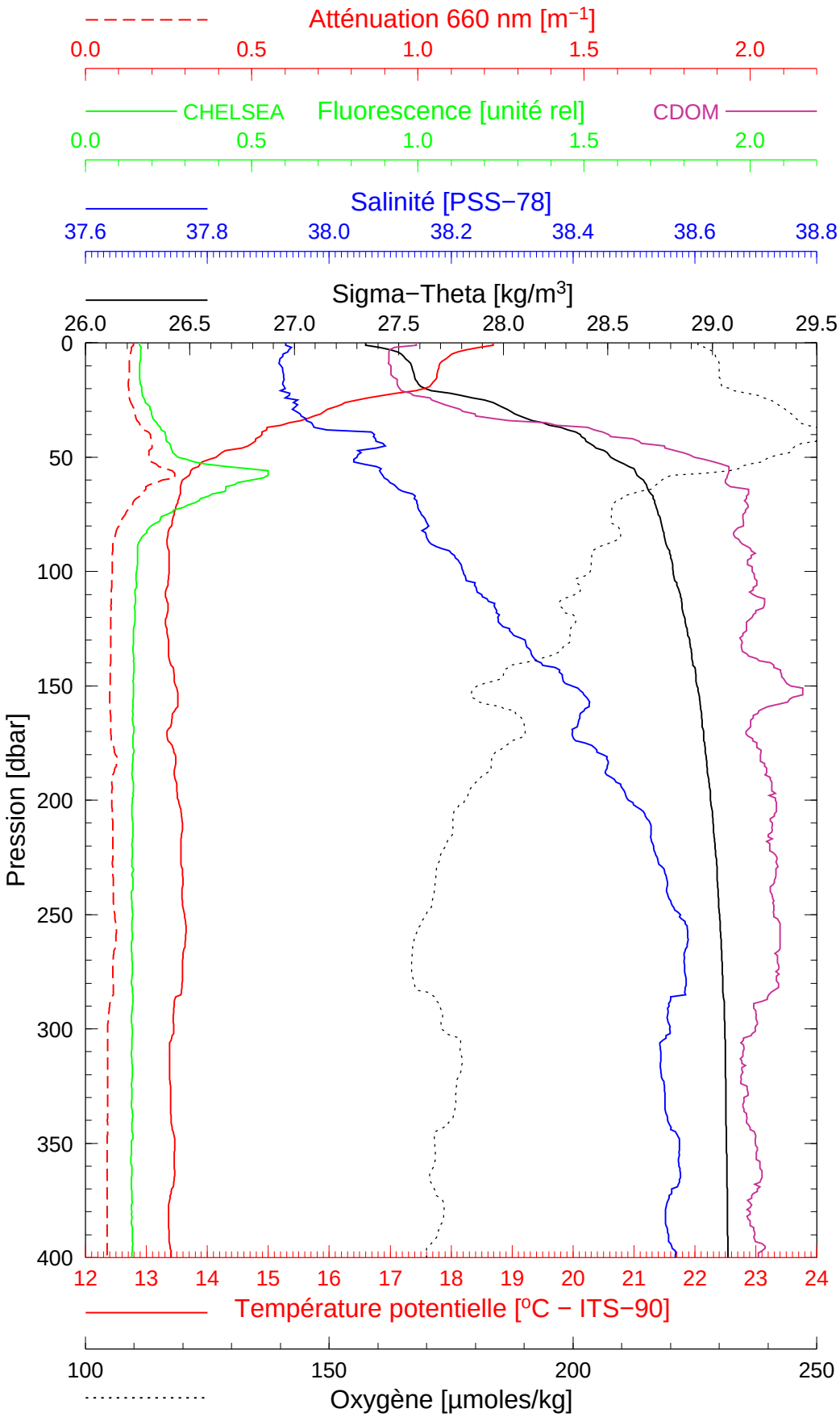


Date *18/05/2011* *Latitude* *43°28.046 N*

Heure déb *14h 38min [TU]* *Longitude* *07°41.909 E*

BOUSSOLE 111 **18/05/2011** **BOUS110518_04**

BOUS004

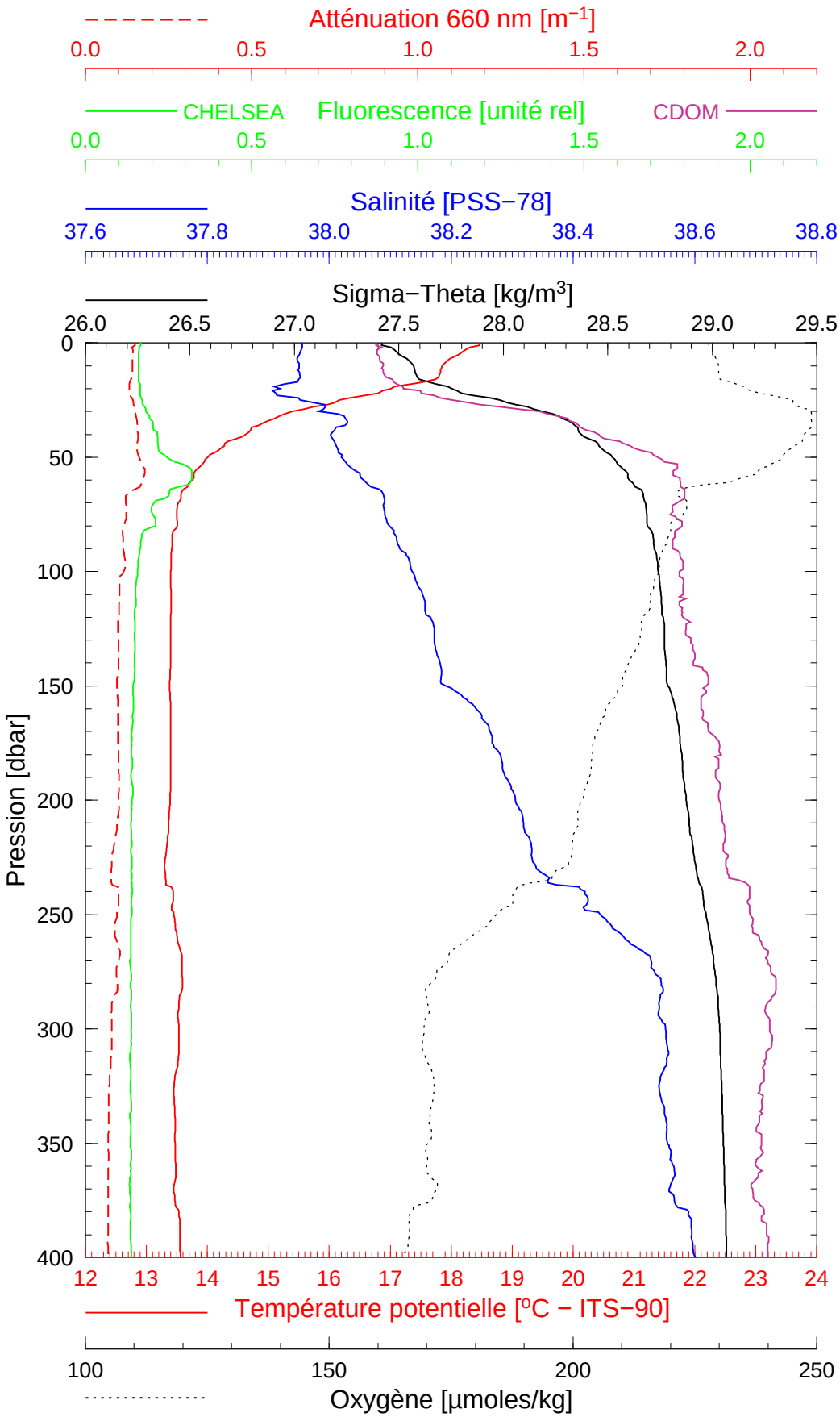


Date *18/05/2011* *Latitude* *43°31.000 N*

Heure déb *15h 35min [TU]* *Longitude* *07°36.952 E*

BOUSSOLE 111 **18/05/2011** **BOUS110518_05**

BOUS005

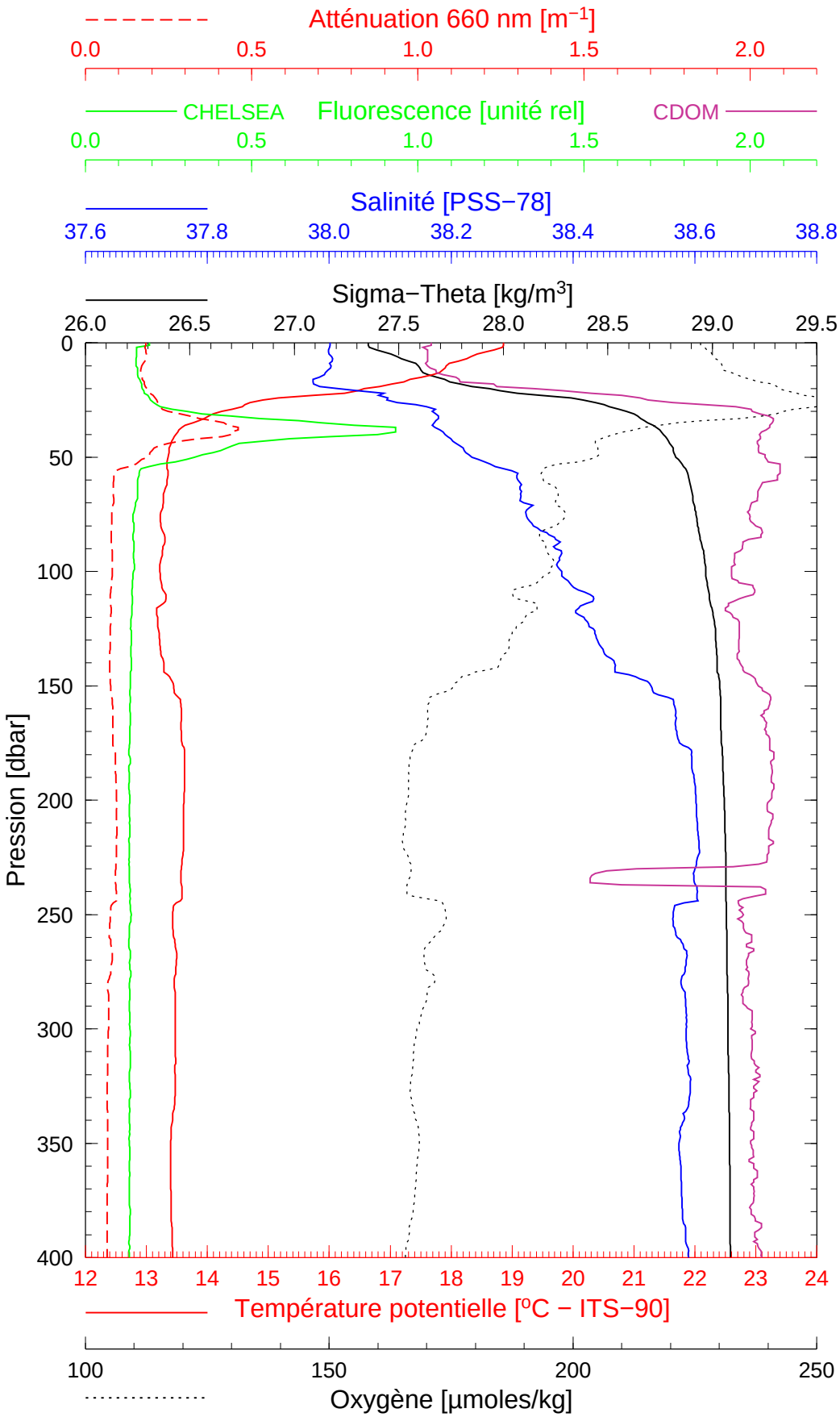


Date *18/05/2011* *Latitude* *43°34.013 N*

Heure déb *16h 36min [TU]* *Longitude* *07°30.931 E*

BOUSSOLE 111 **19/05/2011** **BOUS110519_01**

BOUS006

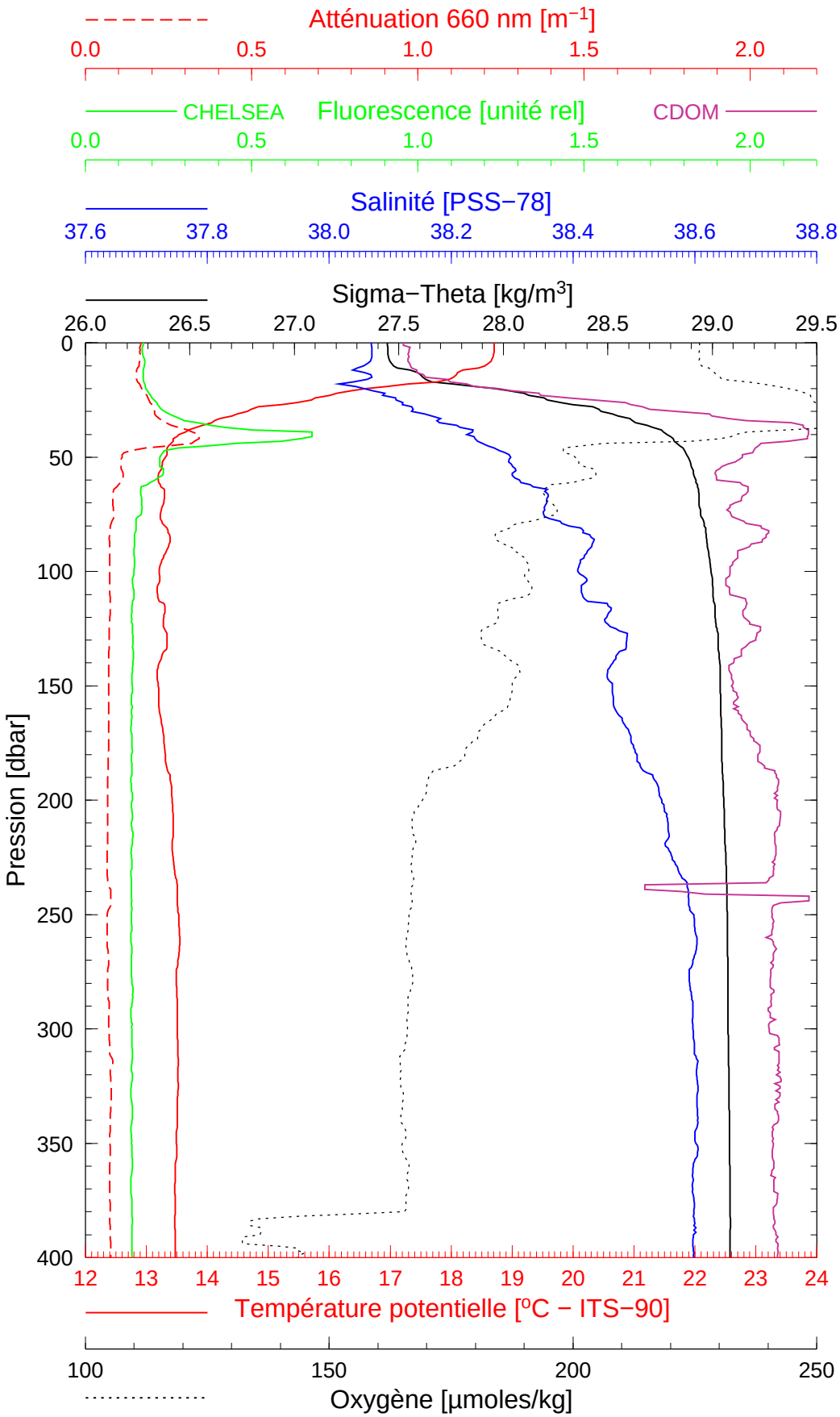


Date *19/05/2011* *Latitude* *43°21.995 N*

Heure déb *12h 02min [TU]* *Longitude* *07°53.950 E*

BOUSSOLE 111 **20/05/2011** **BOUS110520_01**

BOUS007



Date *20/05/2011* *Latitude* *43°21.934 N*

Heure déb *07h 32min [TU]* *Longitude* *07°53.836 E*