BOUSSOLE Monthly Cruise Report

Cruise 100
July 10 - 12, 2010

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

Science Personnel: David Antoine, Emilie Diamond, Yves Lamblard, David Luquet, Vincent Taillandier, Manu and Romain (divers).

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Figure 1. Change of the cable between the Argos beacon on the top of the buoy and the Dacnet.

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

July 27, 2010

Contents

Cruise Objectives

Routine operations

Multiple SPMR profiles are to occur within about 1 hour of satellite overhead passes of MERIS around solar noon, under optimal conditions: clear blue skies and flat, calm sea surface. From last mission, we restart deploying the SPMR SN 006 and its SMSR reference SN 006. From April 2010, we perform optical profiles with a Biospherical's C-OPS (Compact Optical Profiling System) on 0-200 m at the BOUSSOLE site. It will replace the SPMR/SMSR system at short-term. 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 SPMR or 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. A floating platform is to be used to support the SPMR Eu sensor approximately 20cm below the surface for up to 3 minutes of stable light field before a release mechanism triggers the release of the profiler to start a descent as normal. Multiple descents ideally will be started in this way and the data will be used to assess near-surface Eu extrapolation model calculations. CTD deployments are required at the start and end of the SPMR 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. A gimbled PAR sensor positioned on the foredeck and operated from the CTD computer serves as a light field stability indicator during SPMR profiling (until summer of 2007).

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. 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).

Additional operations

Since the 15th June, there were problem with the signal from the ARGOS beacon on the head of the BOUSSOLE buoy; this ARGOS beacon and its cable have been changed to solve this problem when divers were on board. One of the underwater ARGOS beacon has also been taken off that day for maintenance.

Cruise Summary

All of the three cruise days were used during this mission for optical 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 last day for diving operations and data retrieval.

Saturday 10 July 2010

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

Sunday 11 July 2010

The second day, sea state was good and the sky was blue. On site, 6 C-OPS and 3 SPMR profiles, 2 CTD casts with water sampling and 1 Secchi disk were performed.

Monday 12 July 2010

The last day, the sea was very calm with a blue sky. When on site, divers went at sea for cleaning the instruments and changing the cable between the Dacnet and the ARGOS beacon on the top of the buoy. This beacon was also

substituted. Divers also took off one of the two underwater ARGOS beacons and put neoprene caps on the HS4 and on the transmissometers for acquiring three dark measurements. A direct connection with the buoy was established for data retrieval. During this time, 1 CTD cast with water sampling was performed. Then 2 CIMEL measurements and 3 C-OPS profiles were performed and a CISCO connection was established for data retrieval.

Cruise Report

Saturday 10 July 2010 (UTC)

People on board: David Antoine, Emilie Diamond and Vincent Taillandier.

0450 Departure from the Nice port.
0805 Arrival at the BOUSSOLE site.
0810 Secchi disk 01 (21 m).
0815 CISCO connection with buoy and data retrieval.
0830 CTD 01, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, Ap and TSM.
0910 C-OPS 01, 02, 03.
1010 Departure to the first transect station.
1055 CTD 02, 400 m, station 01 (43°25'N 07°48'E).
1200 CTD 03, 400 m, station 02 (43°28'N 07°42'E).
1300 CTD 04, 400 m, station 03 (43°31'N 07°37'E).
1400 CTD 05, 400 m, station 04 (43°34'N 07°31'E).
1500 CTD 06, 400 m, station 05 (43°37'N 07°25'E).
1600 CTD 07, 400 m, station 06 (43°39'N 07°21'E).
1625 Departure to the Nice port.
1650 Arrival at the Nice port.

Sunday 11 July 2010 (UTC)

People on board: Emilie Diamond and Vincent Taillandier.

0430 Departure from the Nice port.
0745 Arrival at the BOUSSOLE site.
0750 C-OPS balancing.
0830 C-OPS 04, 05, 06.
0925 SPMR 01, 02, 03.
1010 CTD 08, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, Ap and TSM.
1100 Filtrations.
1150 Secchi disk 02 (19 m).
1200 C-OPS 07, 08, 09.
1300 CTD 09, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, Ap and CDOM.
1345 Departure to the Nice port.
1700 Arrival at the Nice port.

Monday 12 July 2010 (UTC)

People on board: Emilie Diamond, Vincent Taillandier and 4 divers.

0425 Departure from the Nice port.
0735 Arrival at the BOUSSOLE site.
0745 Diving on the buoy for cleaning instruments, for taking off one of the two underwater ARGOS beacons and for the substitution of the Argos beacon on the top of the buoy and its cable. Dark HS4 and transmissometers measurements at 09:00, 09:15 and 09:30.
0755 CTD 10, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, Ap and TSM.
0915 Direct CISCO connection with buoy and data retrieval. Solar panels, CISCO and ARGOS connections cleaned on the top of the buoy.
0925 CIMEL 01.
1000 C-OPS 10, 11, 12.
1115 CISCO connection with buoy and data retrieval.

1120 CIMEL 02.
1125 Departure to the Nice port.
1440 Arrival at the Nice port.

Problems identified during the cruise

- Each Niskin bottle sampling at 5 m was done just after the CTD cast because the closing system of the 5th and 11th bottles was broken on the rosette. So the Ac9 was at the place of the 5th bottle instead of 12th.

Calculated Swath paths for the MERIS Sensor (ESOV Software)

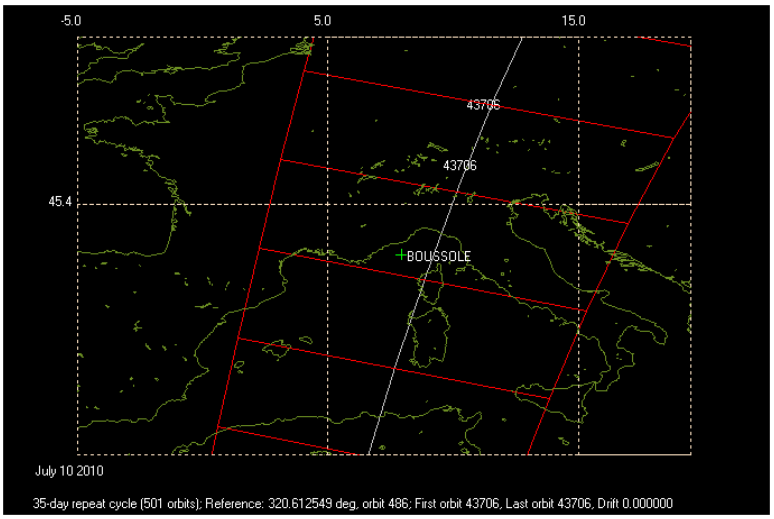
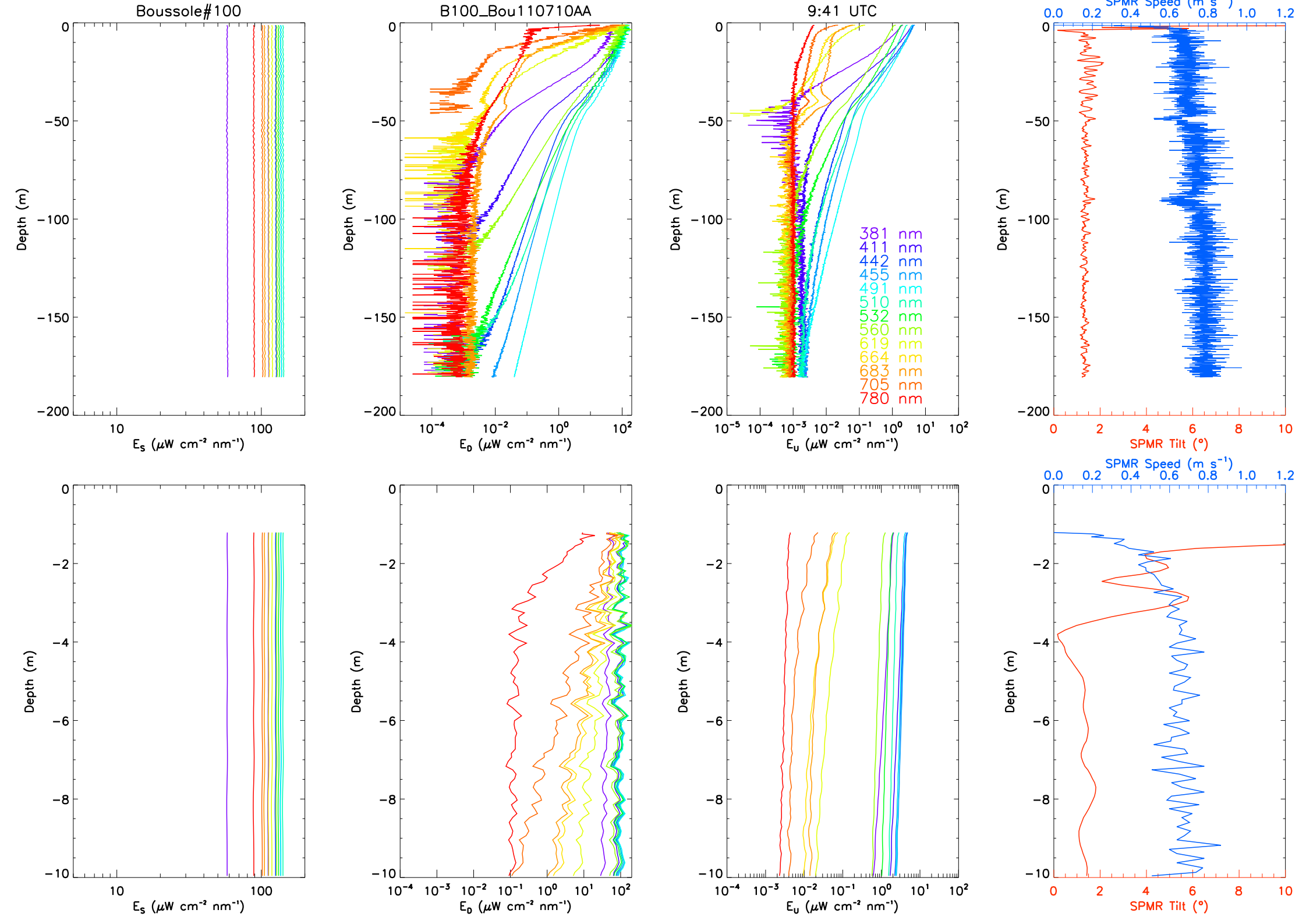


Figure 2. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for July 10th 2010.

Appendix

Cruise Summary Table for Boussole 100

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
				Secchi01	08:10	3:00	21	43	22	7	54	hazy		3					good			calm			no
			CTDBOUS001	HPLC, Ap & TSM	08:32	34:00	400	43	22.086	7	54.184	hazy		4	3	242	1019.8	81		27.2	27.4	calm			no
	bou_c-ops_100710_0910_001_data				09:16	1:26																		
		bou_c-ops_100710_0910_003_data			09:39	3:41	121	43	22.257	7	54.139	blue & hazy	Sc & St	3	1	96	1019.8	80	good	27.6		calm	0.2		no
		bou_c-ops_100710_0953_004_data			09:57	3:15	106	43	22.130	7	54.656	blue & hazy	Sc & St	3	1	96	1019.8	80	good	27.6		calm	0.2		no
		bou_c-ops_100710_0953_005_data			10:06	3:09	101	43	22.064	7	54.814	blue & hazy	Sc & St	3	1	96	1019.8	80	good	27.6		calm	0.2		no
10/07/10	bou_c-ops_100710_0953_006_data				10:27	2:26																		
			CTDBOUS002		11:02	25:00	400	43	25.009	7	46.006	hazy		6	2	271	1019.5	85		27.4	27.3	calm			no
			CTDBOUS003		12:05	28:00	400	43	27.973	7	41.897	hazy		6	4	263	1019.0	80		28.2	27.1	calm			no
			CTDBOUS004		13:06	25:00	400	43	31.000	7	37.000	hazy		6	6	86	1018.7	72		28.6	26.6	calm			no
			CTDBOUS005		14:06	27:00	400	43	34.035	7	31.015	hazy		6	8	245	1018.1	80		27.5	26.0	calm			no
			CTDBOUS006		15:07	26:00	400	43	37.009	7	25.000	hazy		6	7	239	1017.9	79		27.6	26.7	calm			no
			CTDBOUS007		15:59	24:00	400	43	39.009	7	20.994	hazy		1	10	118	1017.0	69		27.6	27.2	calm			no
	bou_c-ops_100711_0835_001_data				08:38	1:25																		
		bou_c-ops_100711_0835_002_data			08:53	4:17	101	43	22.225	7	53.451	blue	Ci	1	5	189	1017.5	84	good	26.2		calm	0.4		no
		bou_c-ops_100711_0835_003_data			09:04	3:55	95	43	22.320	7	53.525	blue	Ci	1	5	189	1017.5	84	good	26.2		calm	0.4		no
		bou_c-ops_100711_0835_004_data			09:14	4:14	95	43	22.363	7	53.695	blue	Ci	1	5	189	1017.5	84	good	26.2		calm	0.4		no
	bou_c-ops_100711_0835_005_data				09:35	1:39																		
	Bou110710black1				09:25	3:00																		
		Bou110710AA			09:41	4:04	180	43	22.169.	7	53.744	blue	Ci	1	7	267	1017.6	86	good	25.6		calm	0.4		no
		Bou110710AB			09:50	2:25	100	43	22.238	7	53.717	blue	Ci	1	7	267	1017.6	86	good	25.6		calm	0.4		no
		Bou110710AC			09:56	2:57	116	43	22.287	7	53.700	blue	Ci	1	7	267	1017.6	86	good	25.6		calm	0.4		no
11/07/10	Bou110710black2				10:06	3:00											1015.4							
			CTDBOUS008	HPLC, Ap & TSM	10:15	31:00	400	43	22.091	7	53.977	blue		2	5	92	1017.5	86		26.0	27.0	calm			no
				Secchi02	11:50	3:00	19	43	22	7	54	blue		3					good			calm			no
	bou_c-ops_100711_1203_001_data				12:04	1:26																		
		bou_c-ops_100711_1203_002_data			12:20	4:31	102	43	22.053	7	54.243	blue	St	3	3	83	1017.8	85	good	26.4		calm	0.5		no
		bou_c-ops_100711_1203_003_data			12:32	3:45	87	43	22.032	7	54.566	blue	St	3	3	83	1017.8	85	good	26.4		calm	0.5		no
		bou_c-ops_100711_1203_004_data			12:42	3:48	91	43	22.021	7	54.827	blue	St	3	3	83	1017.8	85	good	26.4		calm	0.5		no
	bou_c-ops_100711_1203_005_data				12:57	2:03																		
			CTDBOUS009	HPLC, Ap & CDOM	13:05	32:00	400	43	21.985	7	54.101	blue		3	3	125	1017.5	83		26.3	27.1	calm			no
			CTDBOUS010	HPLC, Ap & TSM	08:00	32:00	400	43	22.022	7	54.193	blue & hazy		1	2	244	1015.7	82		27.0	27.2	calm			no
				CIMEL01	09:26	4:00		43	22	7	54	blue		0			1016		good						
	bou_c-ops_100712_1000_001_data				10:09	1:24																		
12/07/10		bou_c-ops_100712_1000_002_data			10:19	5:02	118	43	22.217	7	53.791	blue	None	0	4	71	1016.1	70	good	28.2		calm	0.2		no
		bou_c-ops_100712_1000_003_data			10:30	3:35	84	43	22.311	7	53.962	blue	None	0	4	71	1016.1	70	good	28.2		calm	0.2		no
		bou_c-ops_100712_1000_004_data			10:38	4:09	97	43	22.405	7	53.983	blue	None	0	4	71	1016.1	70	good	28.2		calm	0.2		no
	bou_c-ops_100712_1000_005_data				10:54	1:49																		
				CIMEL02	11:21	4:00		43	21.873	7	53.956	blue		1			1016.1		good						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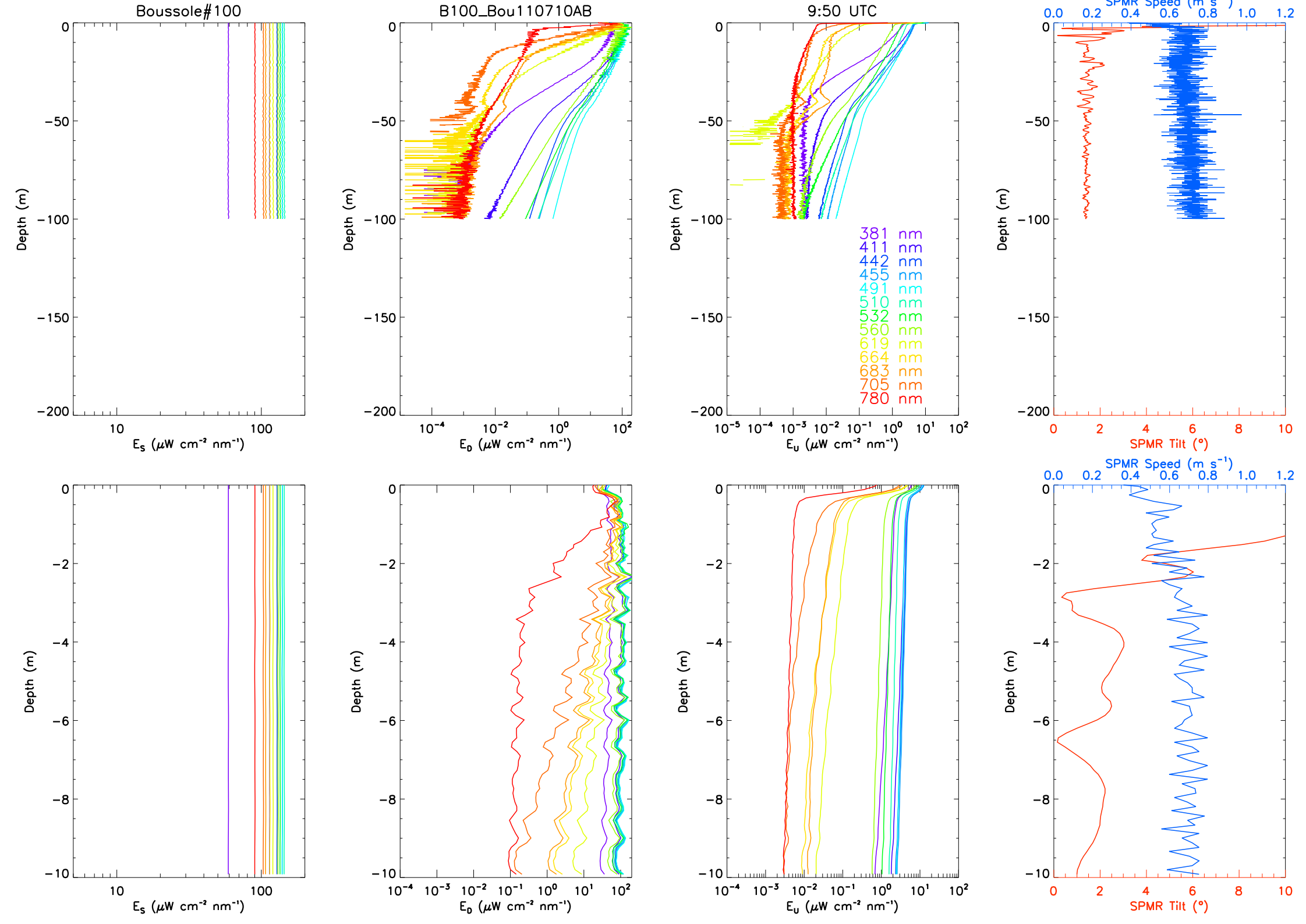
Depth (m)
E_S (μW cm^{-2} nm^{-1})
E_D (μW cm^{-2} nm^{-1})
E_U (μW cm^{-2} nm^{-1})
381 nm
411 nm
442 nm
455 nm
491 nm
510 nm
532 nm
560 nm
619 nm
664 nm
683 nm
705 nm
780 nm
SPMR Speed (m s^{-1})
SPMR Tilt (°)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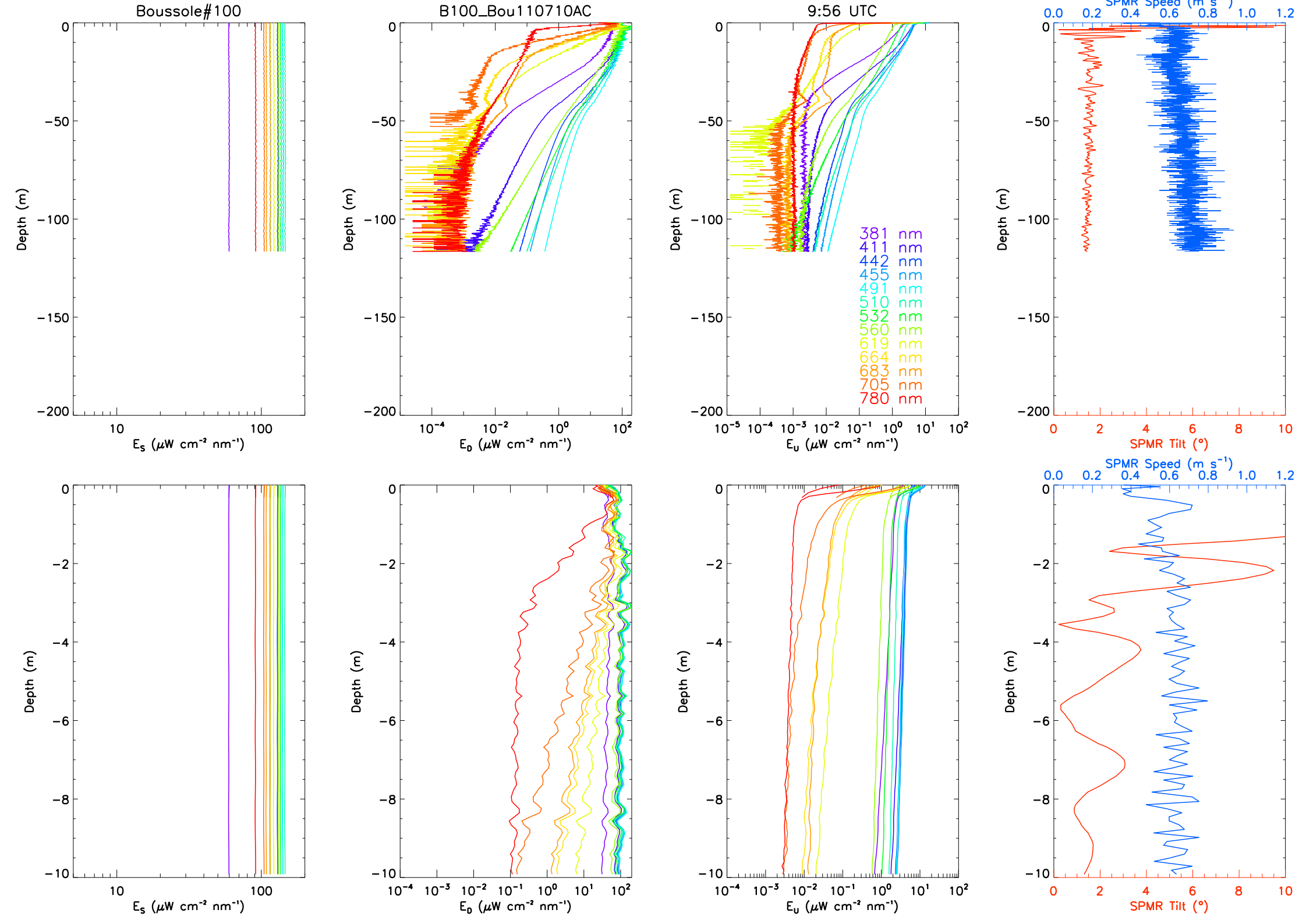
Depth (m)
E_S (μW cm^{-2} nm^{-1})
E_D (μW cm^{-2} nm^{-1})
E_U (μW cm^{-2} nm^{-1})
381 nm
411 nm
442 nm
455 nm
491 nm
510 nm
532 nm
560 nm
619 nm
664 nm
683 nm
705 nm
780 nm
SPMR Speed (m s^{-1})
SPMR Tilt (°)


Boussole#100
B100_Bou110710AC
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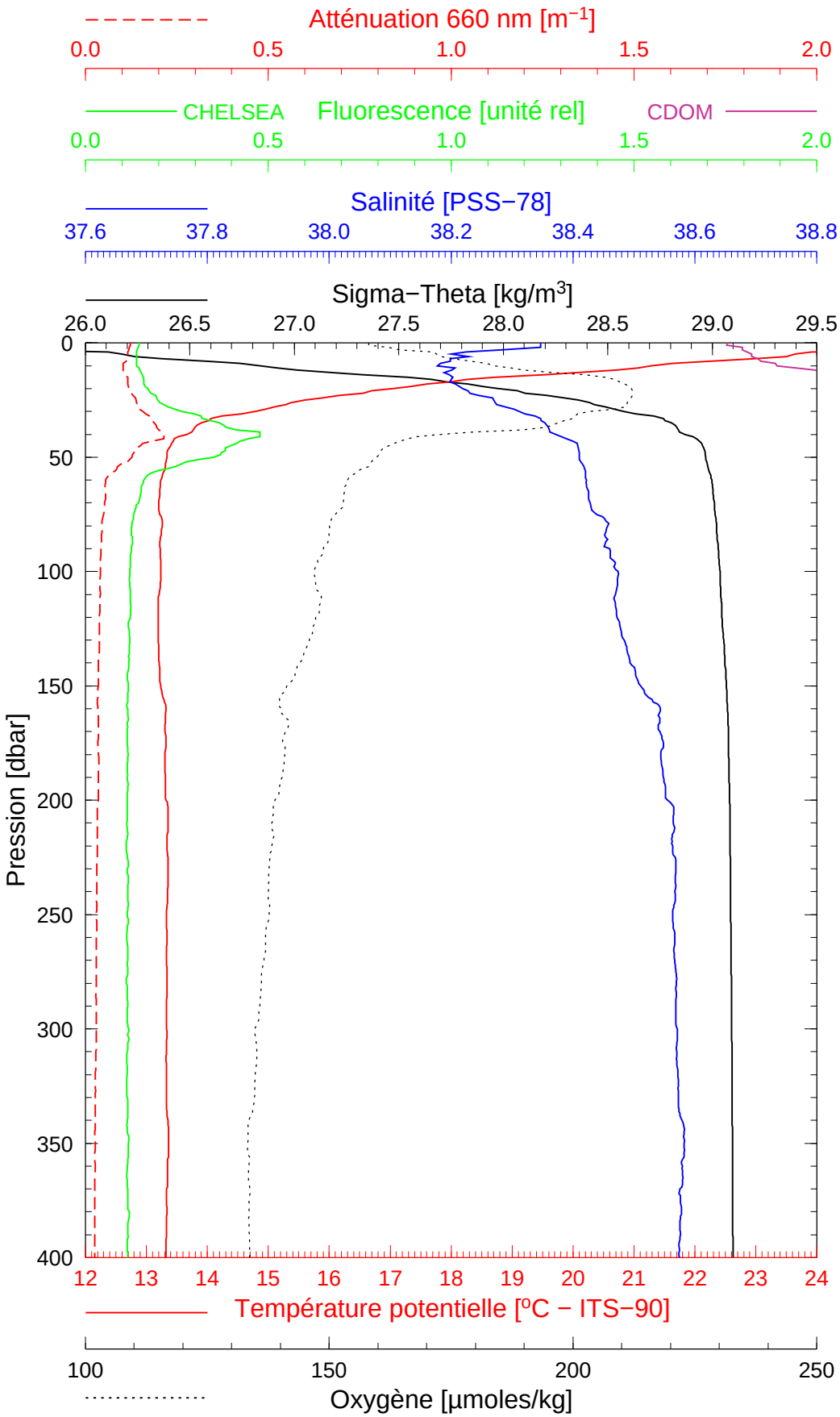
Depth (m)
E_S (μW cm^{-2} nm^{-1})
E_D (μW cm^{-2} nm^{-1})
E_U (μW cm^{-2} nm^{-1})
381 nm
411 nm
442 nm
455 nm
491 nm
510 nm
532 nm
560 nm
619 nm
664 nm
683 nm
705 nm
780 nm
SPMR Speed (m s^{-1})
SPMR Tilt (°)

BOUSSOLE 100 **10/07/2010** **BOUS100710_01**

BOUS001

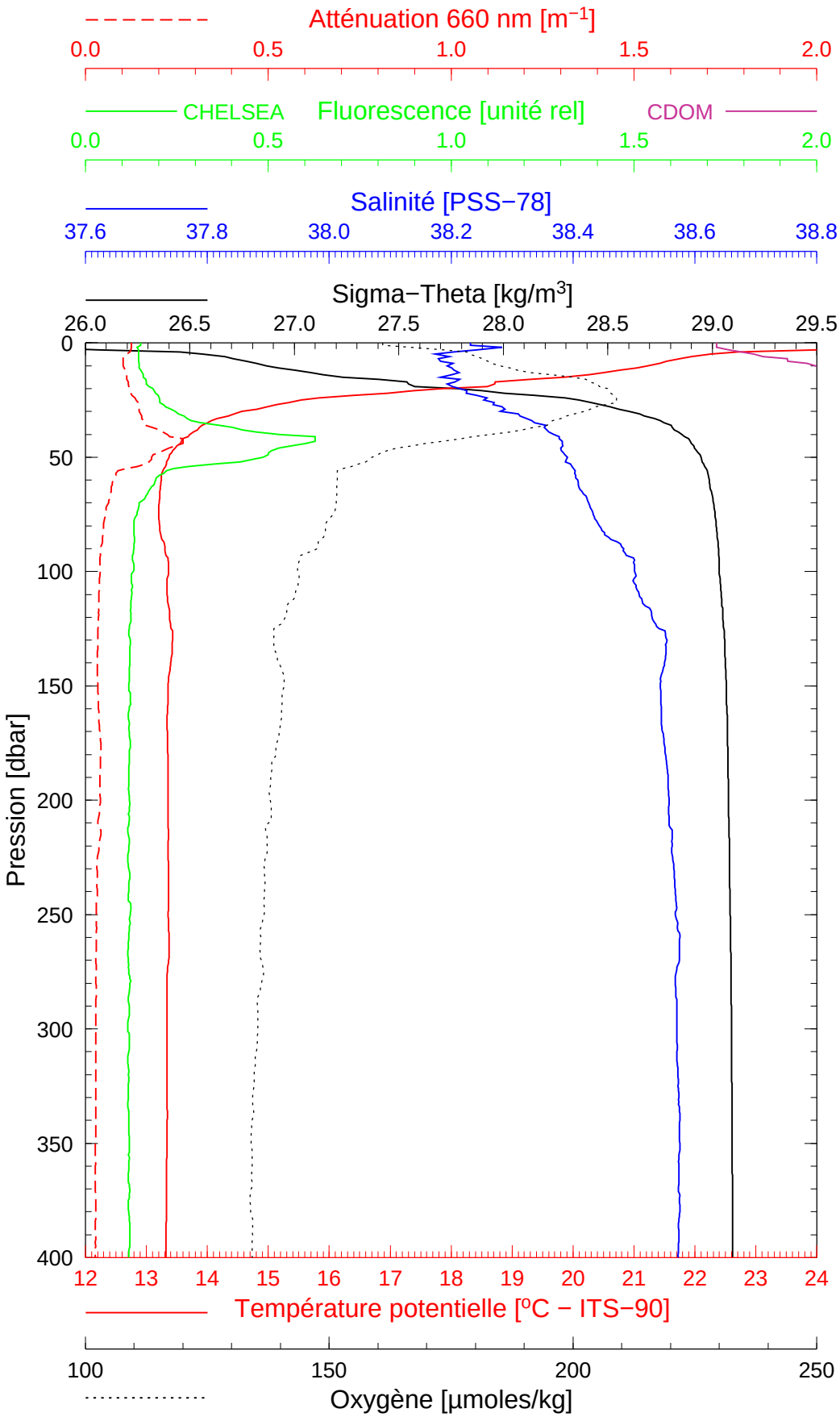


Date *10/07/2010* *Latitude* *43°22.086 N*

Heure déb *08h 31min [TU]* *Longitude* *07°54.184 E*

BOUSSOLE 100 **10/07/2010** **BOUS100710_02**

BOUS002



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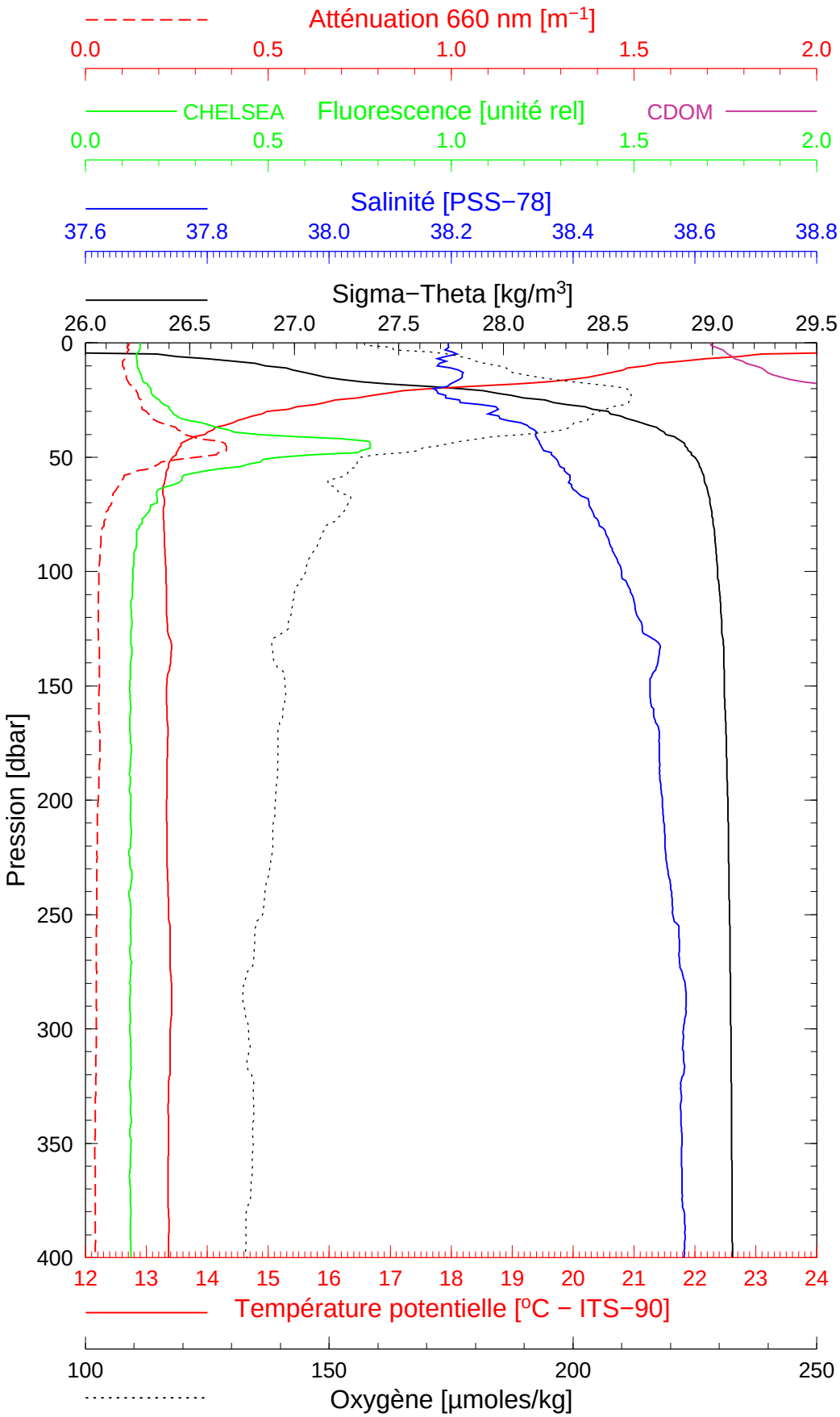
BOUSSOLE 100 **10/07/2010** **BOUS100710_03**

BOUS003



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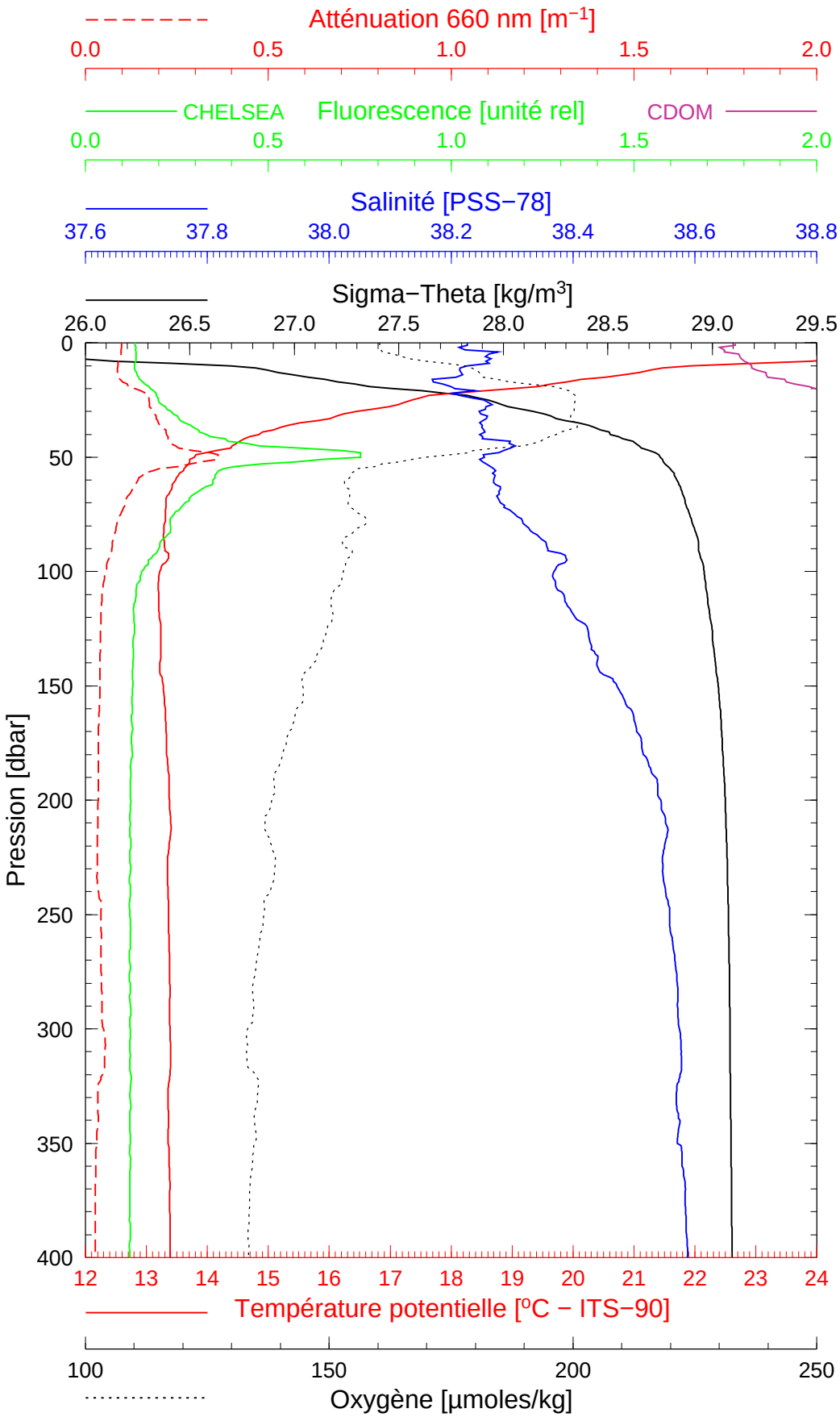
BOUSSOLE 100 **10/07/2010** **BOUS100710_04**

BOUS004



Date *10/07/2010* *Latitude* *43°31.000 N*

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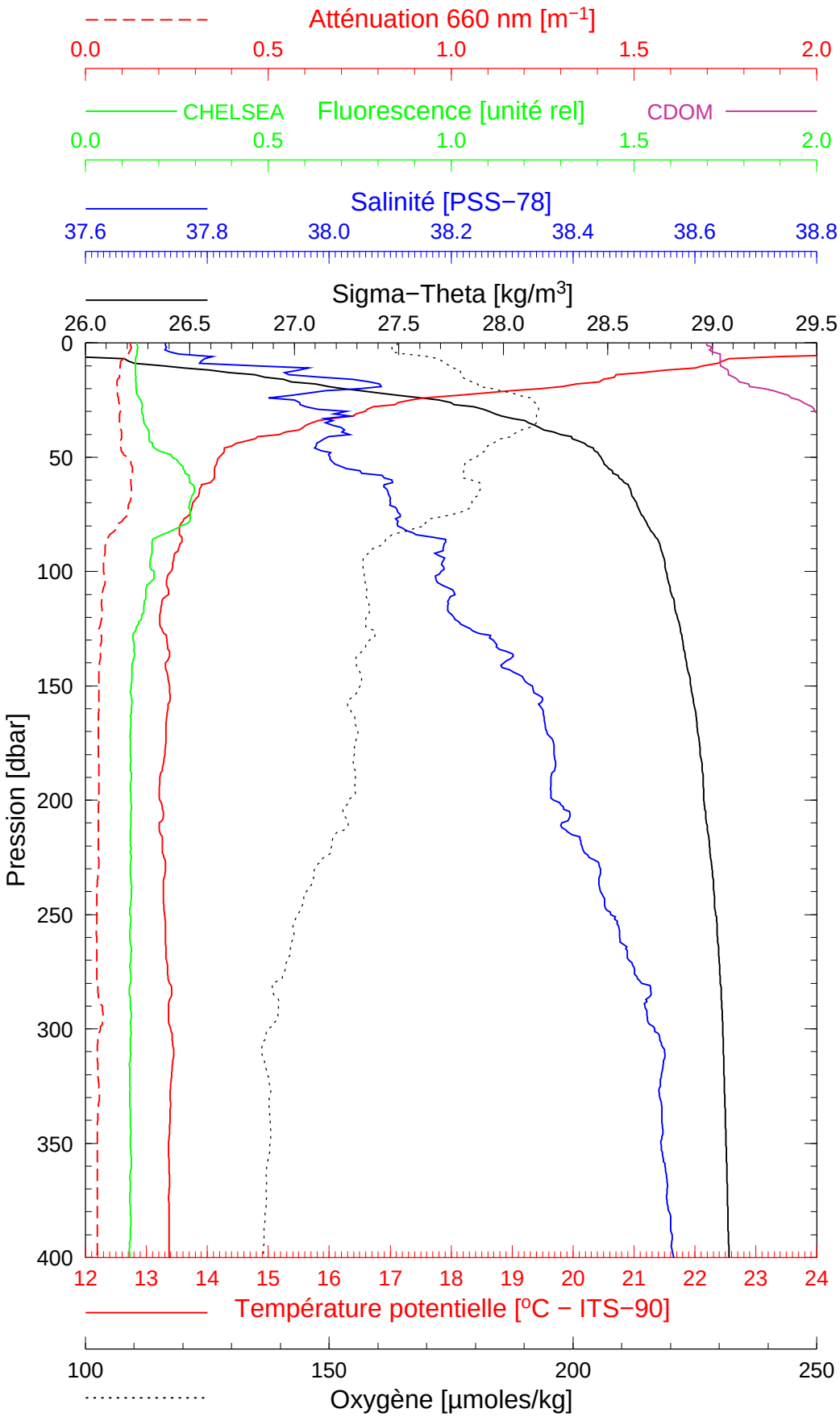
BOUSSOLE 100 **10/07/2010** **BOUS100710_05**

BOUS005



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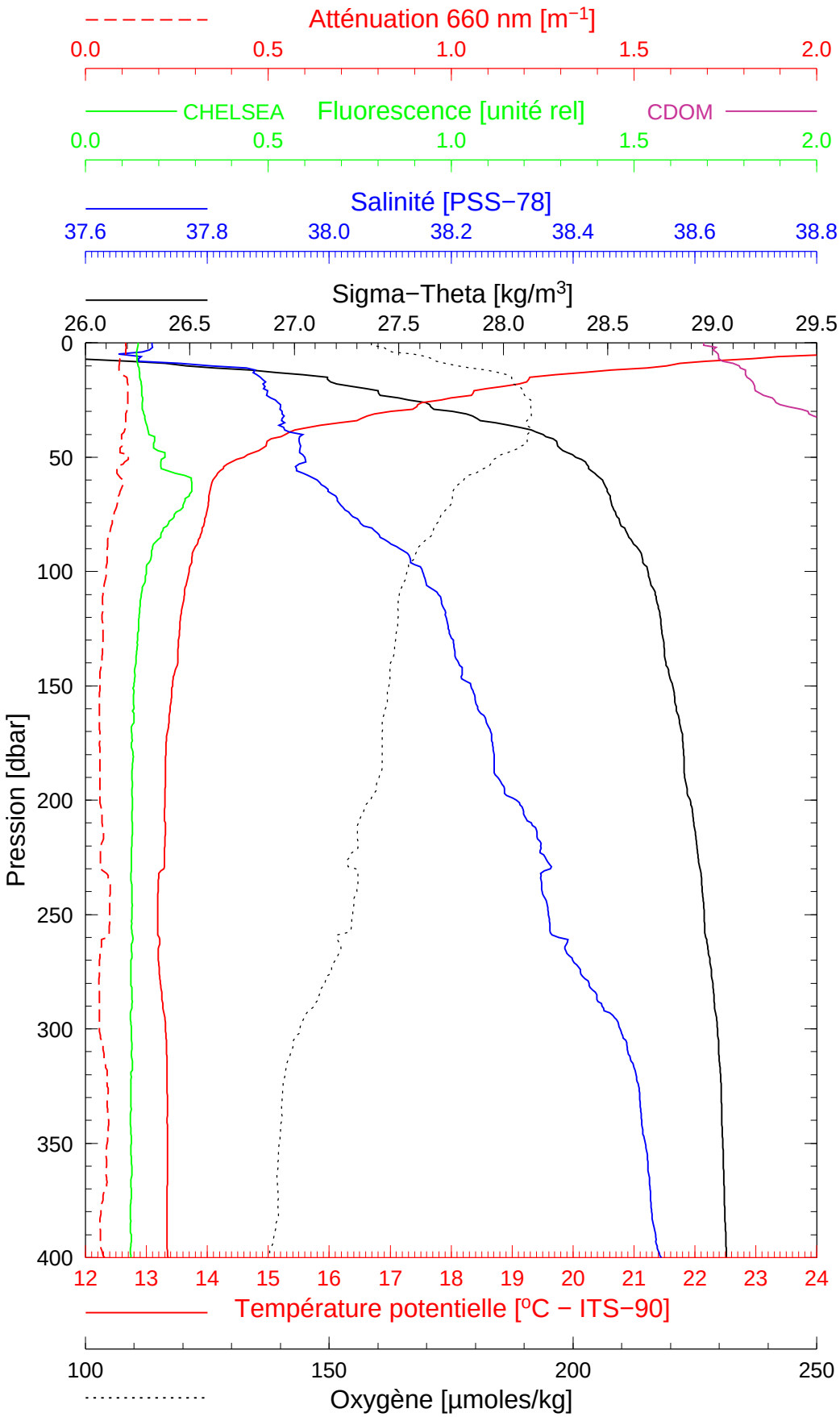
BOUSSOLE 100 **10/07/2010** **BOUS100710_06**

BOUS006

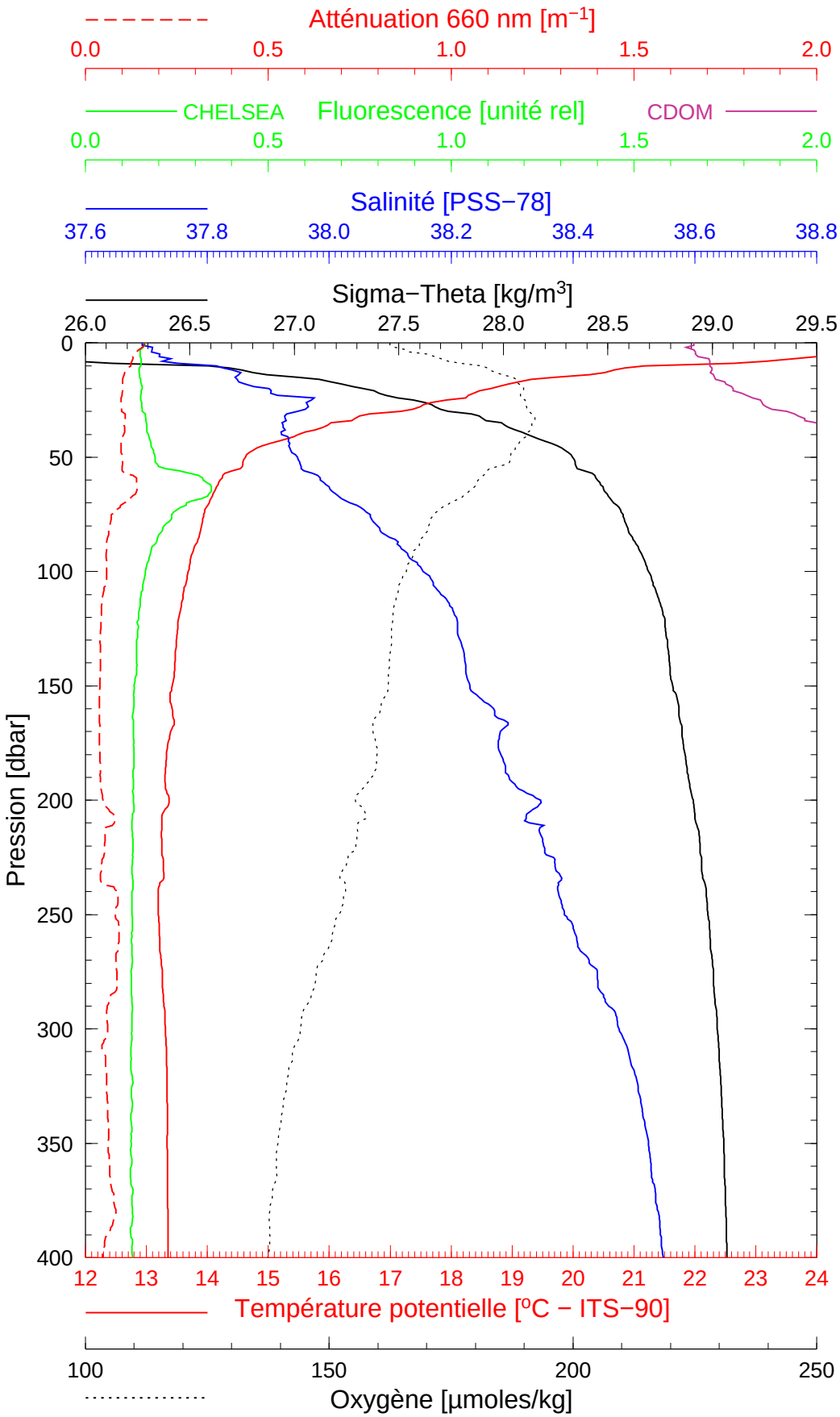


Date *10/07/2010* *Latitude* *43°37.009 N*

Heure déb *15h 07min [TU]* *Longitude* *07°25.000 E*

BOUSSOLE 100 **10/07/2010** **BOUS100710_07**

BOUS007

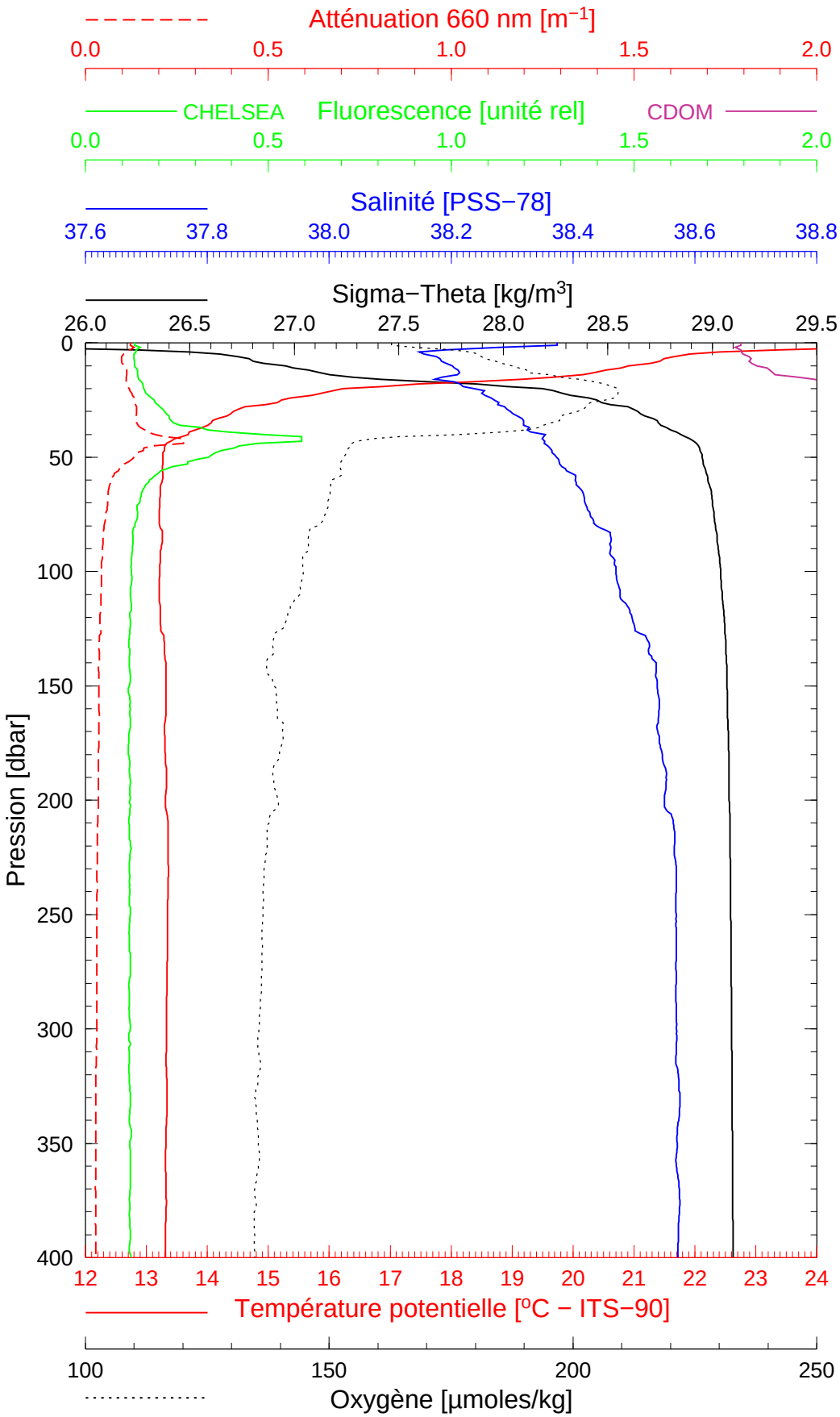


Date *10/07/2010* *Latitude* *43°39.009 N*

Heure déb *15h 59min [TU]* *Longitude* *07°20.994 E*

BOUSSOLE 100 **11/07/2010** **BOUS100711_01**

BOUS008



Date *11/07/2010* *Latitude* *43°22.091 N*

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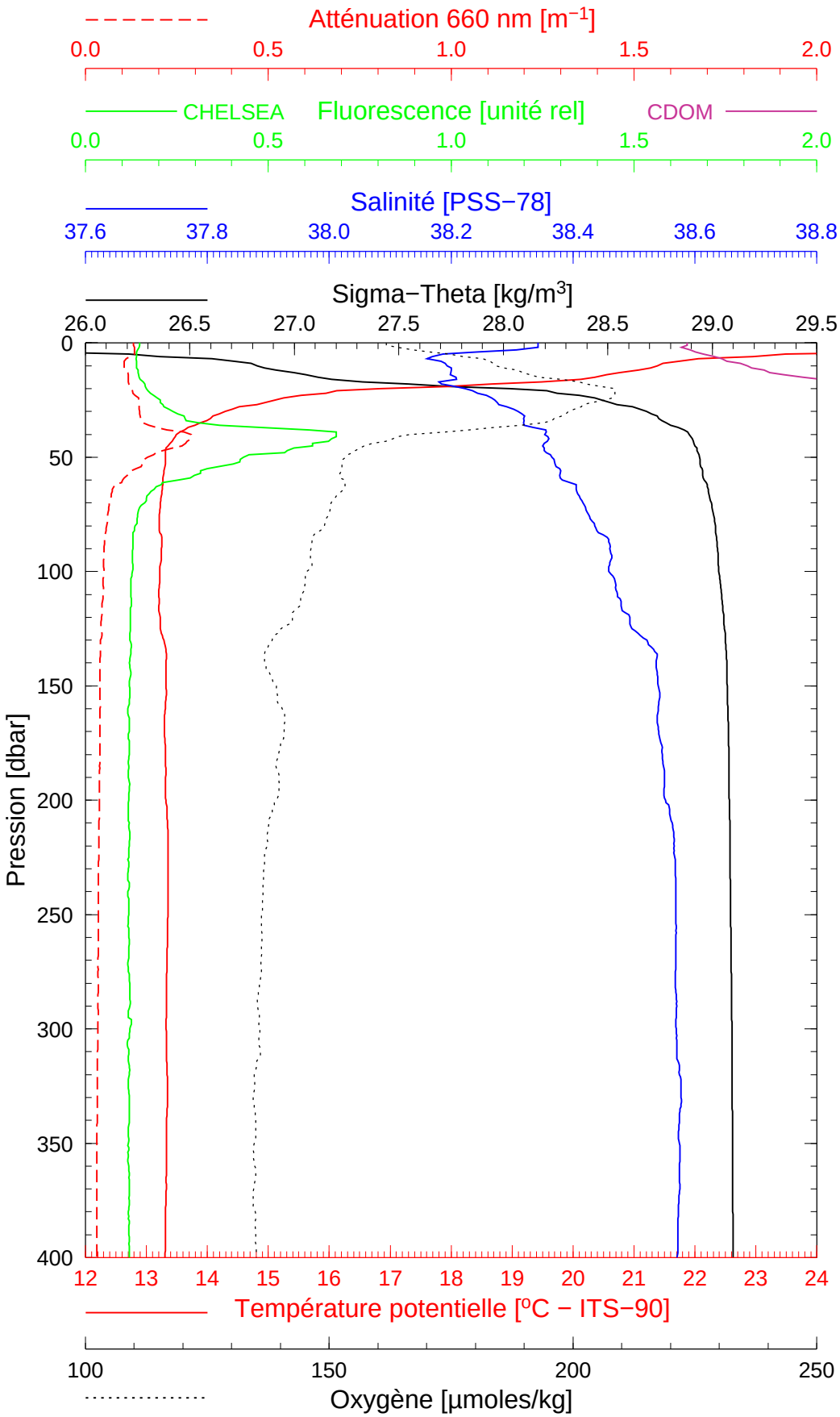
BOUSSOLE 100 **11/07/2010** **BOUS100711_02**

BOUS009



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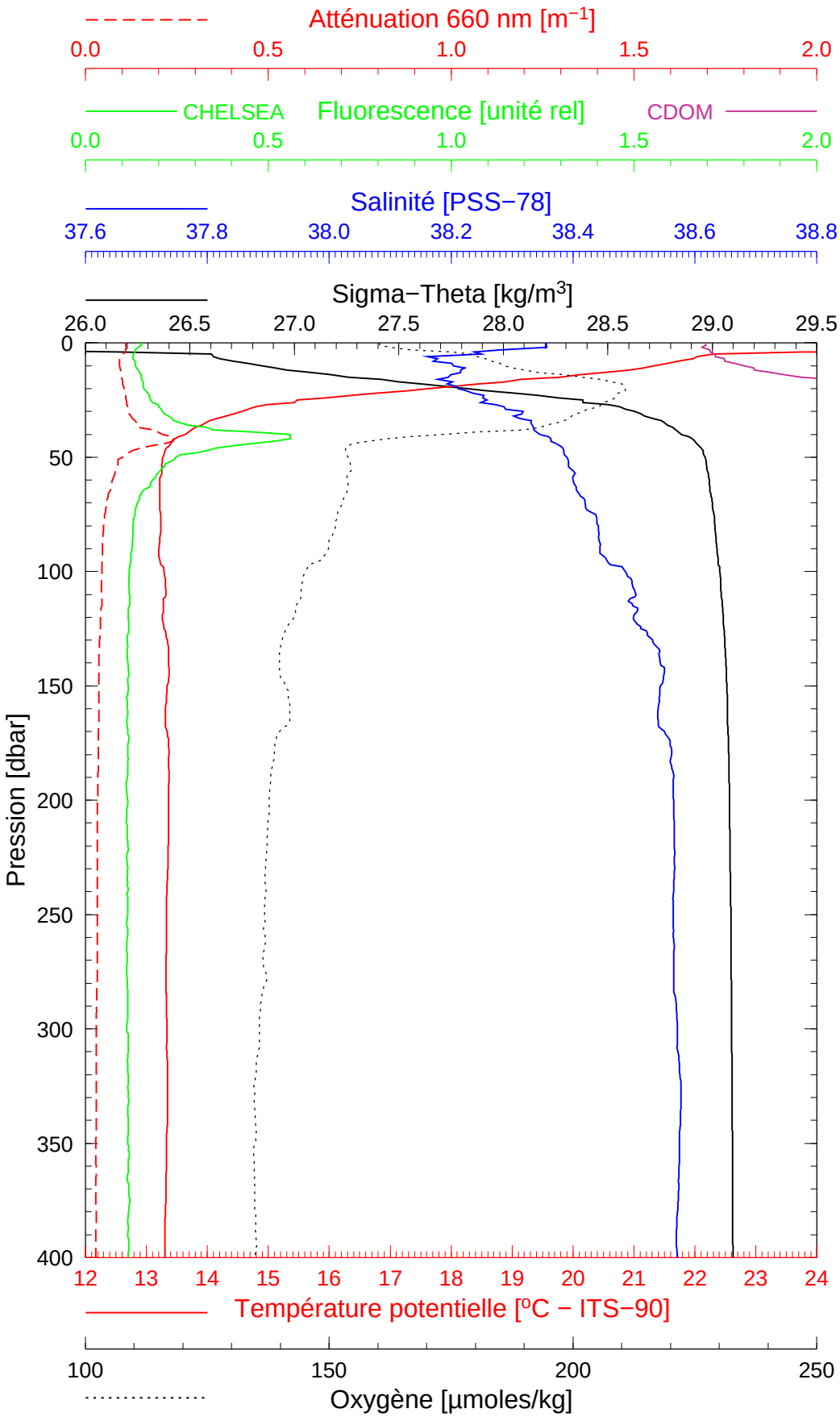
BOUSSOLE 100 **12/07/2010** **BOUS100712_01**

BOUS009



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Heure déb *08h 00min [TU]* *Longitude* *07°54.193 E*