

BOUSSOLE Monthly Cruise Report

Cruise 97

April 23 - 25, 2010

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

Vessel: R/V Téthys II

(Captain: Rémy Lafond)

Science Personnel: Jean de Vaugelas, Emilie Diamond, Yves Lamblard, Olivier Javoy, Grigor Obolensky, Vincent Taillandier et Emmanuel.

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



Figure 1. "Green" colour of the sea at BOUSSOLE during the bloom 2010.

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

April 29, 2010



Contents

1. Cruise Objectives
2. Cruise Summary
3. Cruise Report
4. Problems identified during the cruise
5. Calculated Swath paths for Meris Sensor

Appendix

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 this mission, we will restart deploying the SPMR SN 006 and its SMSR reference SN 006. 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 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 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. A gimbed 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

The Biospherical's C-OPS (Compact Optical Profiling System) have been tested on 0-150 m at the BOUSSOLE site to perform optical profiles and to compare them with SPMR measurements. Grigor Obolensky performed a PVM 0-1000 m profile at the BOUSSOLE site. The 22nd of April 2010, a new buoy has been deployed so, when on board, divers had to check the general state of the buoy and its different sensors. The hydrophone of the CRC (Marineland) for identification of cetaceans has also been installed on the buoy that day.

Cruise Summary

Two of the three cruise days were used, due to the bad weather on the first day. The second day was used for CTD casts on a part of the transect and for buoy data retrieval. The last day was used for diving operations, optical, PVM and CTD casts with sampling at the BOUSSOLE site and for completing the transect.

Friday 23 April 2010

Bad weather prevented departure from the Nice port.

Saturday 24 April 2010

Weather conditions were rough all along the day on large (H1/3 1.8 m, wind speed 20 kn, covered sky at BOUSSOLE site) but were correct near the coast (H1/3 0.3 to 1.0 m) so the transect was completed from station 6 to station 2. At the BOUSSOLE site, buoy data were retrieved through CISCO connection.

Sunday 25 April 2010

The last day, sea state was good with some wind blowing and blue sky. When arrived on site, divers went at sea to check all buoy sensors and to clean them. They also installed the hydrophone of the CRC (Marineland). A direct connection with the buoy was established for data retrieval. The light blaze on the top of the buoy, broken

during the last deployment, was also changed. During this time, a deep CTD was performed because the sea cable was badly winded up on the windlass and had to be unrolled on 1500 m. Then, 3 SPMR profiles, 1 CTD cast with water sampling, 1 PVM profile, 1 Secchi disk, 2 CIMEL measurements and 3 C-OPS profiles were performed. After 1 CTD cast was performed at the station 1 to complete the transect.

Cruise Report

Friday 23 April 2010 (UTC)

Bad weather prevented departure from the Nice port.

Saturday 24 April 2010 (UTC)

People on board: Emilie Diamond and Vincent Taillandier.

0500 Departure from the Nice port.
0530 CTD 01, 400 m, station 06 (43°39'N 07°21'E).
0630 CTD 02, 400 m, station 05 (43°37'N 07°25'E).
0730 CTD 03, 400 m, station 04 (43°34'N 07°31'E).
0835 CTD 04, 400 m, station 03 (43°31'N 07°37'E).
0935 CTD 05, 400 m, station 02 (43°28'N 07°42'E).
1010 Lunch.
1100 Arrival at the station 01: bad sea conditions.
1140 Arrival at the BOUSSOLE site: bad sea conditions.
1215 CISCO connection with buoy and data retrieval.
1230 Secchi disk 01 (8 m).
1235 Departure to the Nice port.
1555 Arrival at the Nice port.

Sunday 25 April 2010 (UTC)

People on board: Jean de Vaugelas, Emilie Diamond, Yves Lamblard, Olivier Javoy, Grigor Obolensky, Vincent Taillandier and Emmanuel (diver).

0515 Departure from the Nice port.
0830 Arrival at the BOUSSOLE site.
0845 Diving on the buoy for cleaning instruments and for fixing the hydrophone on the buoy at 20 m. Dark HS4 and transmissometers measurements at 09:30, 09:45 and 10:00.
0910 CTD 1000, 1750 m.
0915 Direct connection with the buoy for data retrieval and CISCO and ARGOS connections cleaned.
1015 A new light blaze installed on the top of the buoy.
1030 SPMR 01, 02, 03 and C-OPS reference in parallel.
1200 CTD 06, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, Ap, TSM and CDOM.
1250 PVM, 1000 m.
1315 Secchi disk 02 (8 m).
1320 CIMEL 01, 02.
1400 C-OPS tests.
1420 C-OPS 01, 02, 03 and SMSR reference in parallel.
1525 Departure to the first transect station.
1600 CTD 07, 400 m, station 01 (43°25'N 07°48'E).
1630 Departure to the Nice port.
1920 Arrival at the Nice port.

Problems identified during the cruise

- Bad weather prevented departure from Nice port the 1st day and sea conditions were not optimal the 2nd day.
- The CDOM sensor and the transmissometer on the CTD did not work during this mission.
- The sea cable was badly winded up on the windlass. Sailors saw that during the CTD 04 and the waste of time prevented the AC9 measurements during the up cast. The day after, sailors had to unroll the sea cable on 1500 m to wind it up well on the windlass. Grigor Obolensky and Vincent Taillandier took this opportunity to perform a deep CTD cast.
- Some anodes near buoy sphere must be changed the next time.

Calculated Swath paths for the MERIS Sensor (ESOV Software)

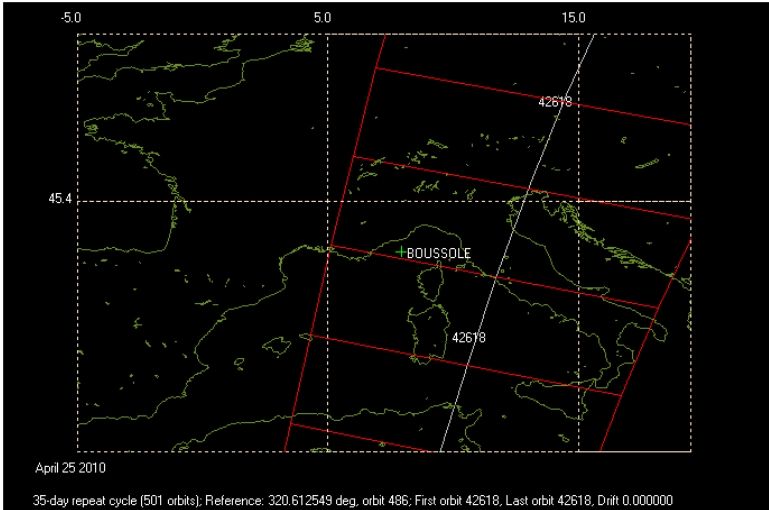
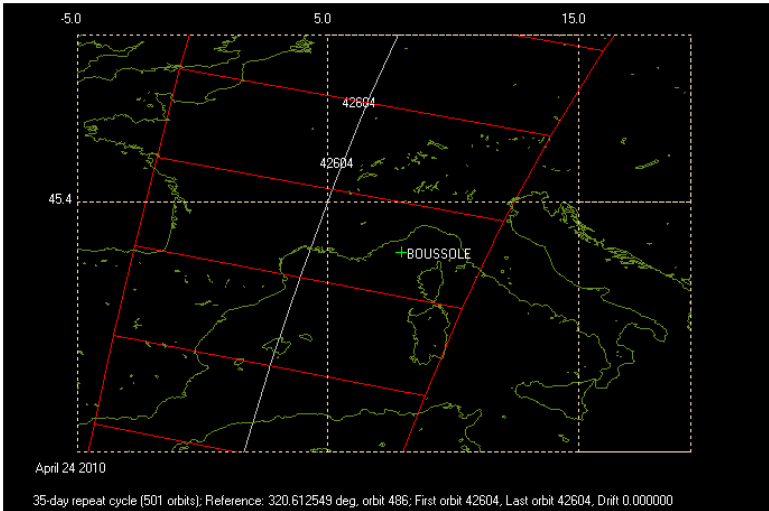


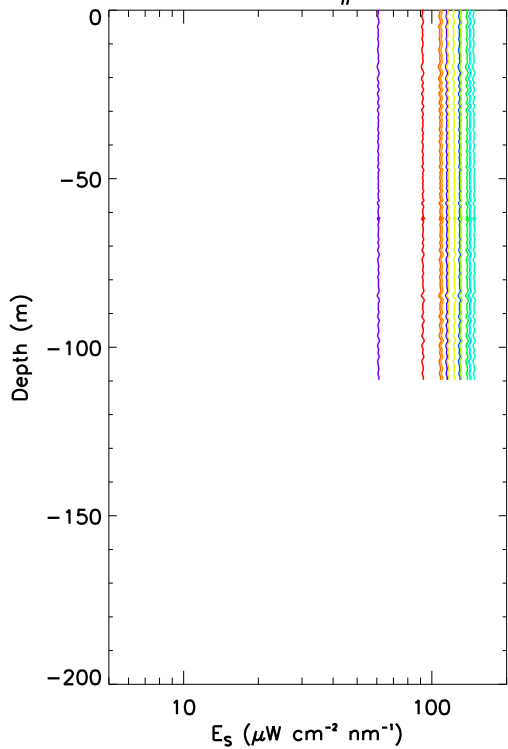
Figure 2. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for 24 and 25 April 2010.

Appendix

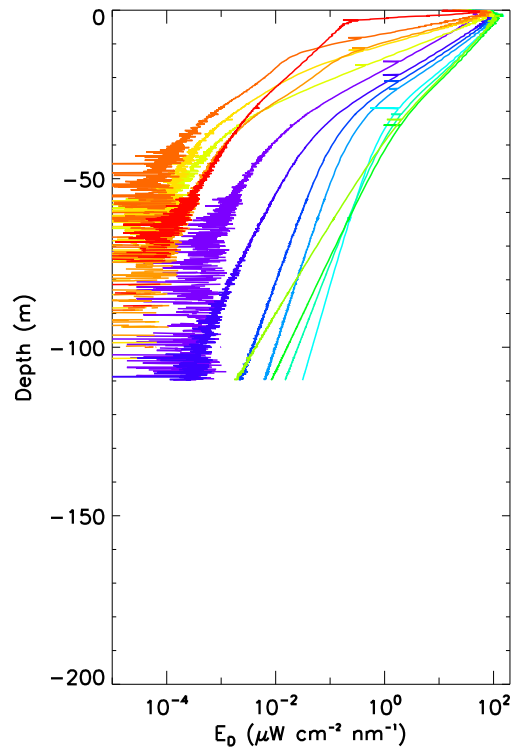
Cruise Summary Table for Boussole 97

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		Atrm. Pressure (hPa)	Humidity (%)	Visibility	T air	T water	Sea	Sea Swell H (m)	Swell dir.	Whitecaps
23/04/10																									
24/04/10			CTDBOUS001		5:38	27:00	400	43	38.965	7	21.022	overcast		7	1	80	1014.1	86		15.5	15.4	calm		no	
			CTDBOUS002		06:35	15:00		43	36.999	7	24.963	overcast		7	1	29	1014.7	91		15.1	14.5	calm		no	
			CTDBOUS003		7:37	24:00	400	43	33.974	7	30.960	overcast		6	5	40	1015.0	88		15.0	14.6	calm		no	
			CTDBOUS004		8:51	20:00	400	43	31.001	7	36.972	overcast		6	7	121	1015.6	84		15.6	14.6	calm		no	
			CTDBOUS005		9:42	24:00	400	43	28.047	7	41.992	overcast		6	7	184	1016.0	75		17.4	14.8	moved		few	
				Secchi01	12:30	3:00	8	43	22	7	54	overcast		6					medium						yes
	Bou250410black1				10:48	3:00																			
		Bou250410AA			11:10	3:30	110	43	22.695	7	53.891	blue		0	10	265	1022.3	80	excellent	16.9		calm	0.2	no	
		Bou250410AB			11:18	3:40	144	43	22.801	7	53.909	blue		0	10	265	1022.3	80	excellent	16.9		calm	0.2	no	
		Bou250410AD			11:27	3:57	75	43	22.881	7	53.920	blue		0	10	265	1022.3	80	excellent	16.9		calm	0.2	no	
	Bou250410black2				11:44	3:00																			
			CTDBOUS006	HPLC, Ap, TSM & CDOM	12:10	26:00	400	43	22.138	7	54.140	blue		1	5	226	1022.1	80		18.7	14.7	calm		no	
				Secchi02	13:15	3:00	8	43	22	7	54	blue		0					good			calm		no	
				CIMEL01	13:27	6:00		43	22.174	7	54.612	blue		0			1021.8		good					no	
				CIMEL02	13:47	6:00		43	22.147	7	54.786	blue		0			1021.6		good					no	
	bou c-ops 100425 1417_001				14:21	3:00																			
		bou c-ops 100425 1417_002			14:37	3:45	110	43	22.350	7	54.951	blue	St	1	4	219	1021.4	88	good	18.0		calm	0.3	no	
		bou c-ops 100425 1417_003			14:47	2:50	100	43	22.384	7	55.195	blue	St	1	4	219	1021.4	88	good	18.0		calm	0.3	no	
		bou c-ops 100425 1417_004			14:56	2:25	80	43	22.428	7	55.449	blue	St	1	4	219	1021.4	88	good	18.0		calm	0.3	no	
	bou c-ops 100425 1417_005				15:21	2:30																			
			CTDBOUS007		16:05	23:00	400	43	24.998	7	47.984	blue		1	9	122	1021.4	87		16.8	14.9	calm		no	

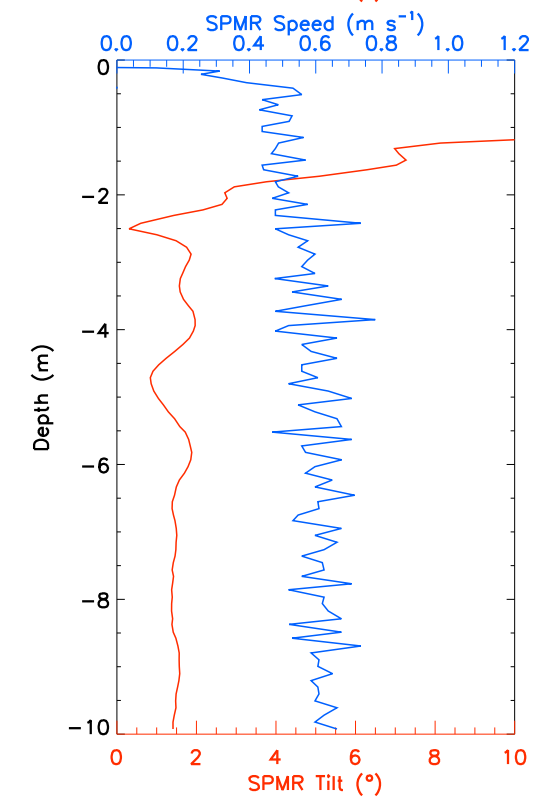
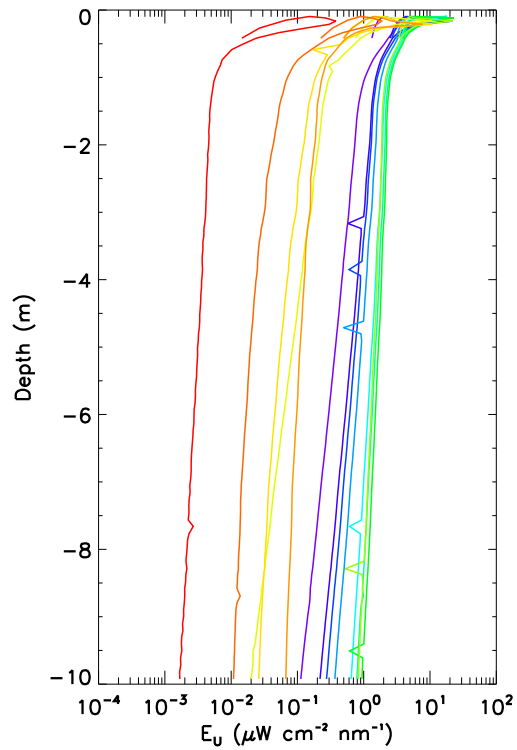
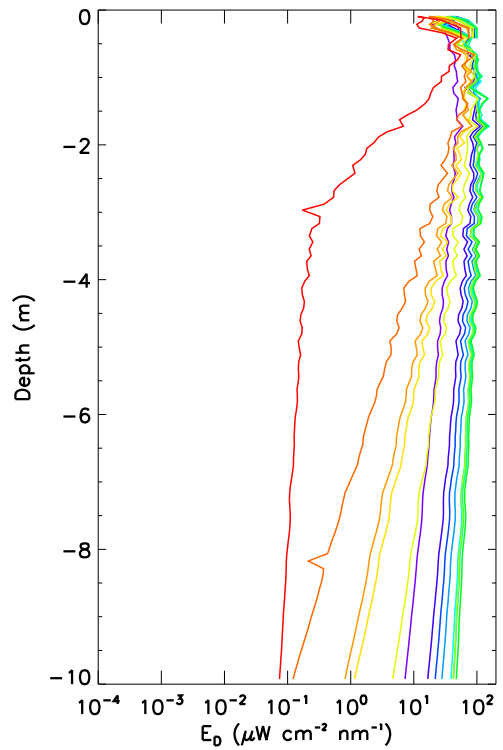
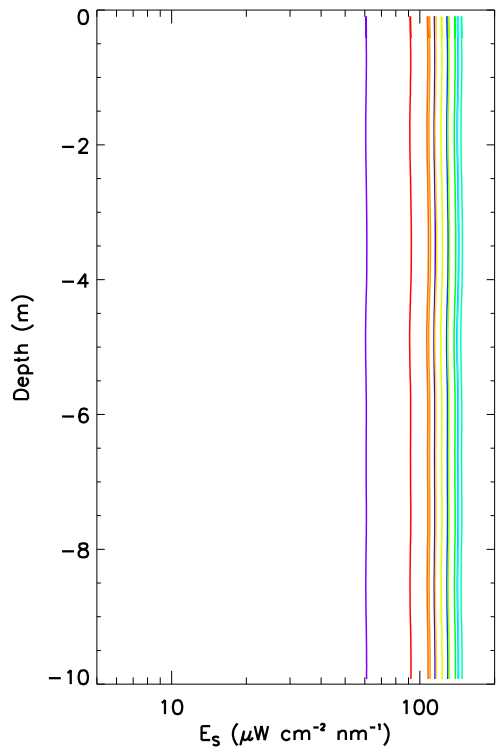
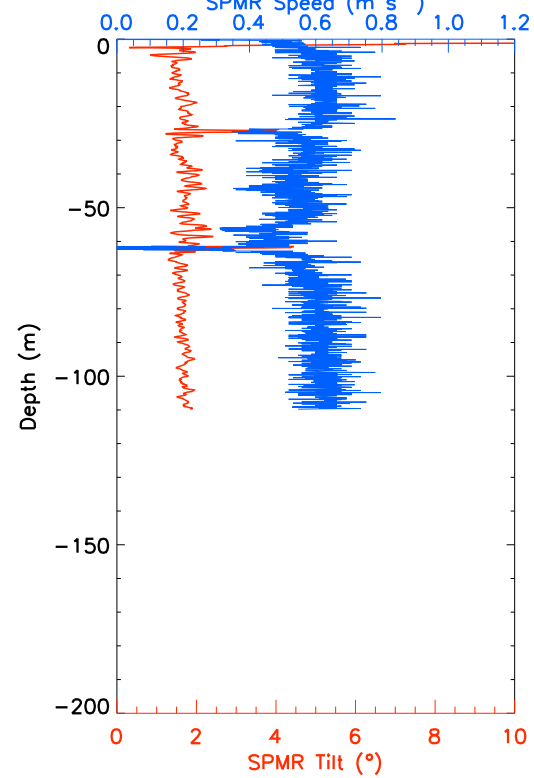
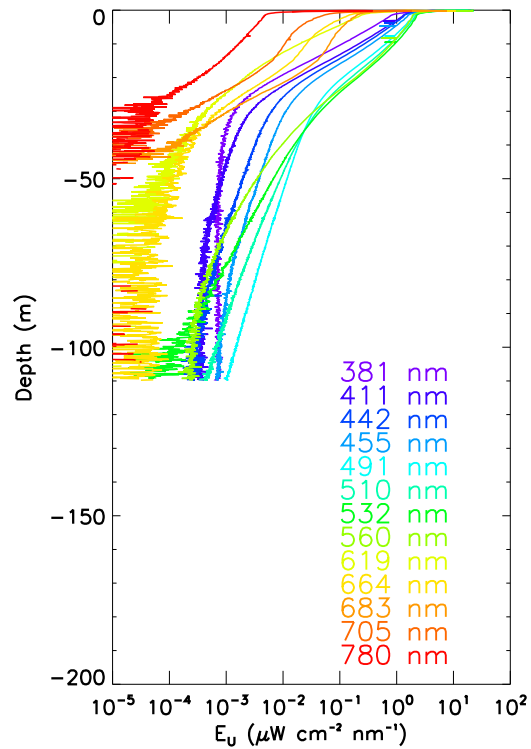
Boussole#97



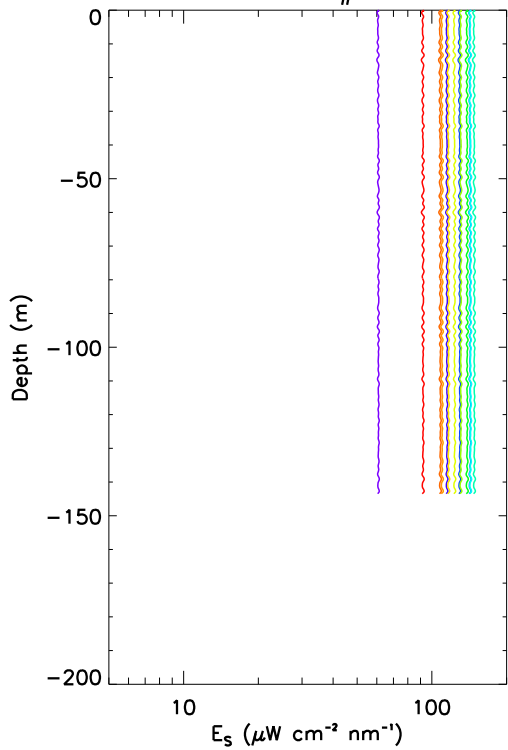
B97_Bou250410AA



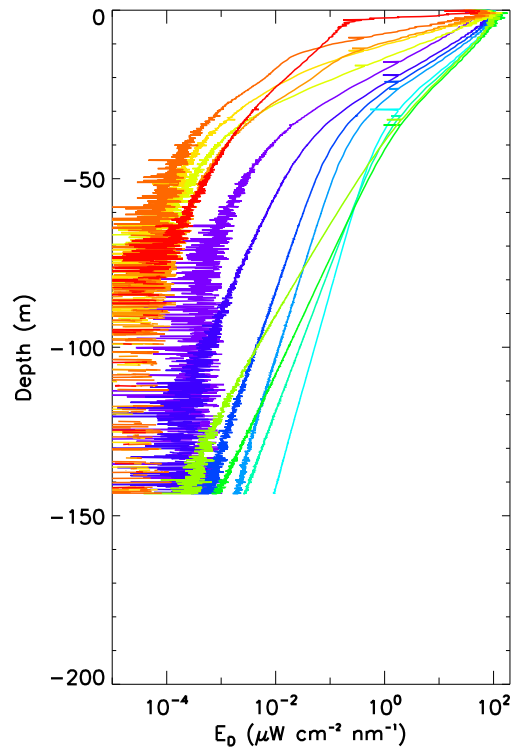
11:10 UTC



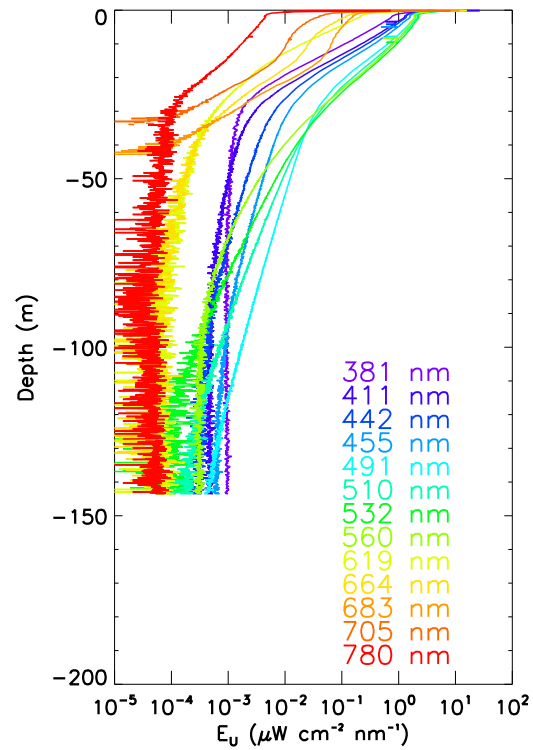
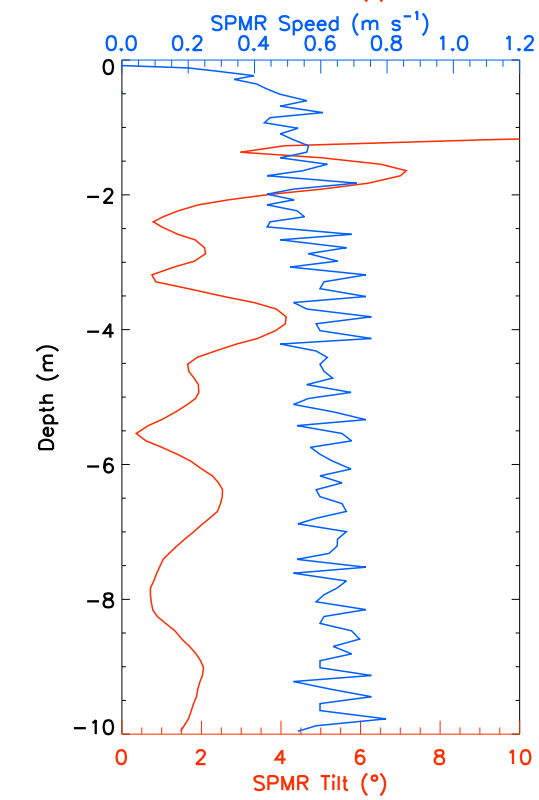
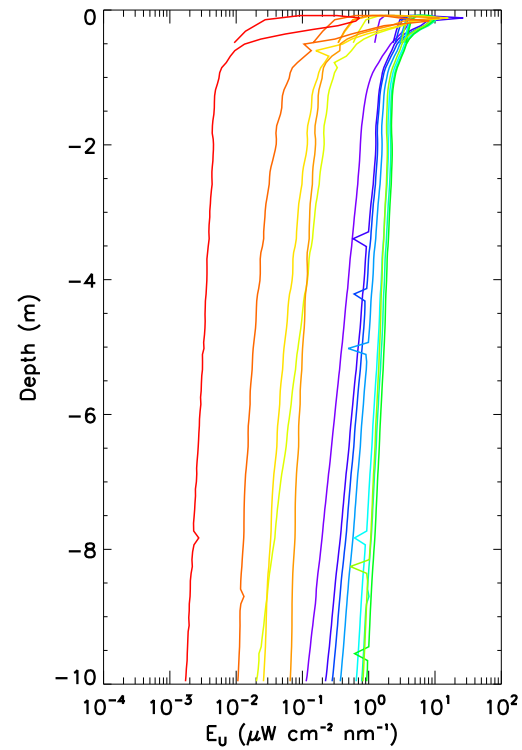
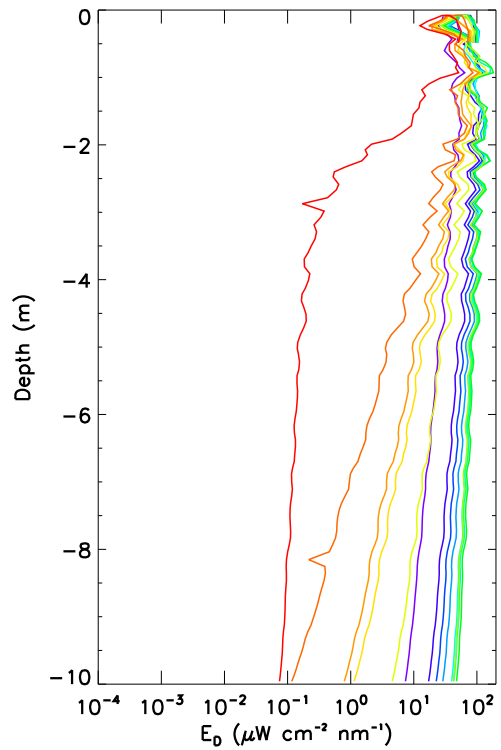
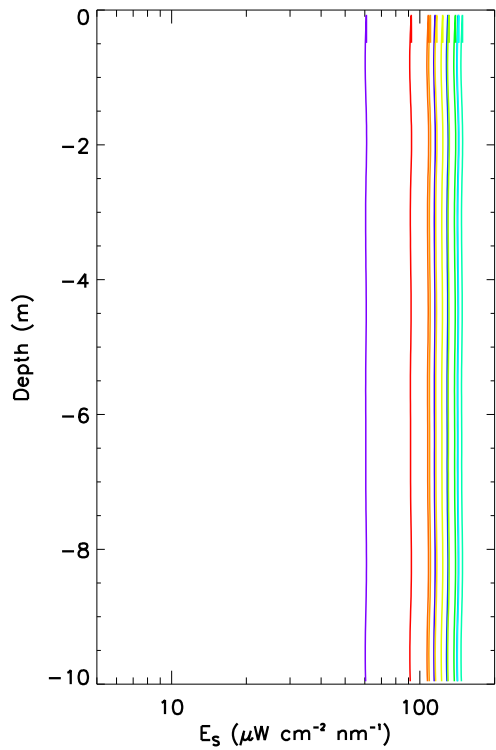
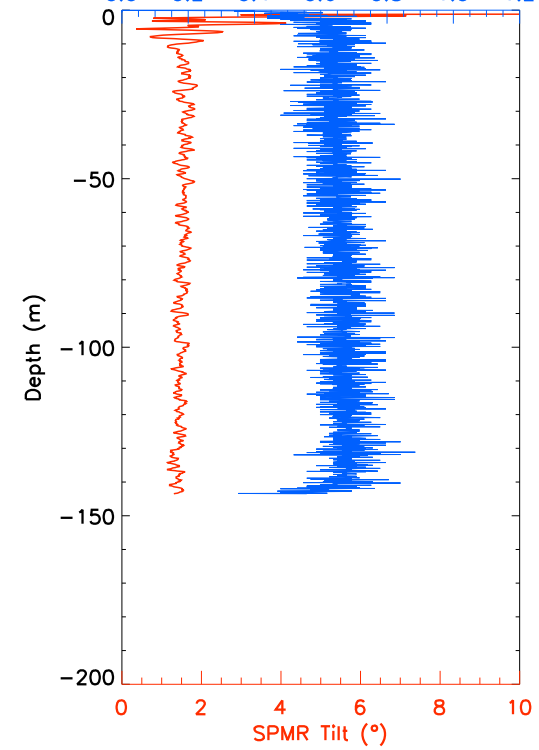
Boussole#97



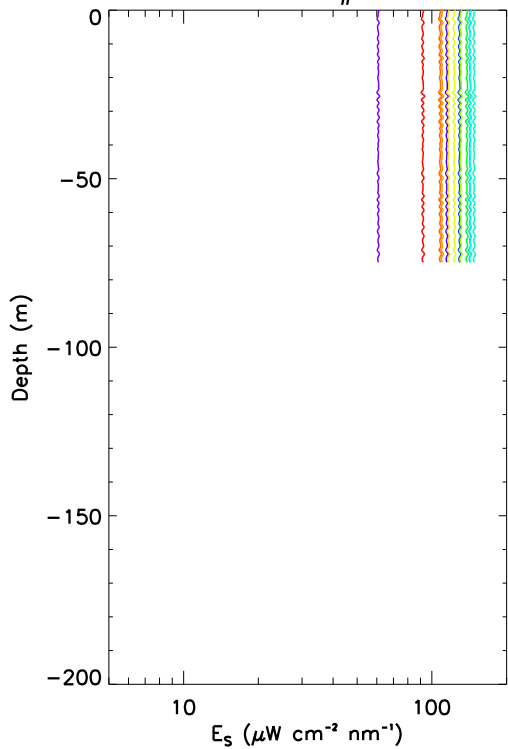
B97_Bou250410AB



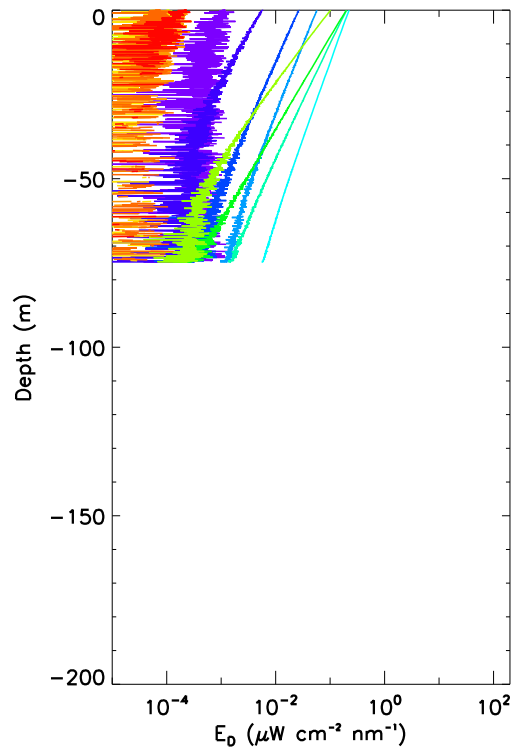
11:19 UTC

SPMR Speed (m s^{-1})

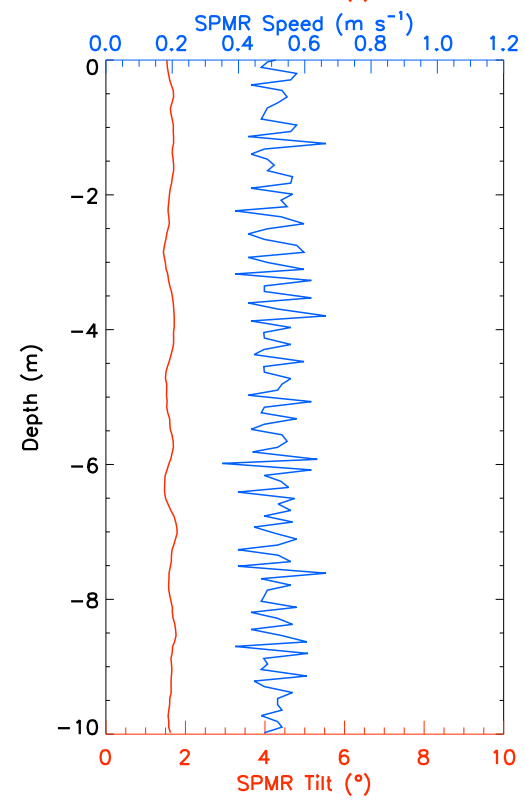
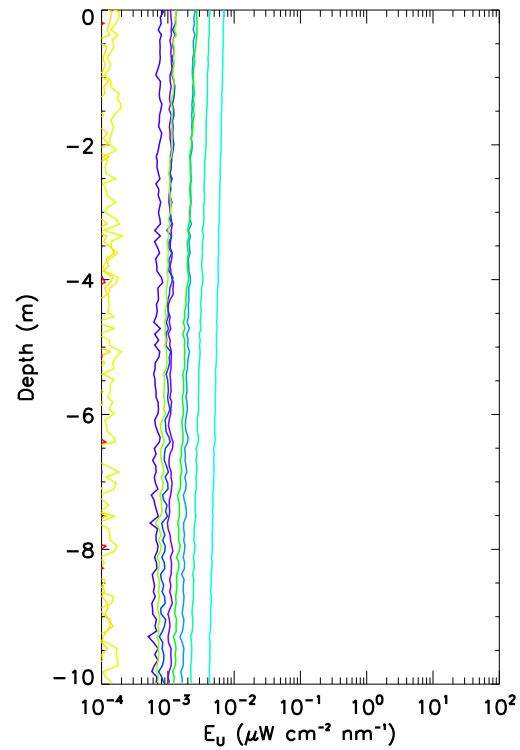
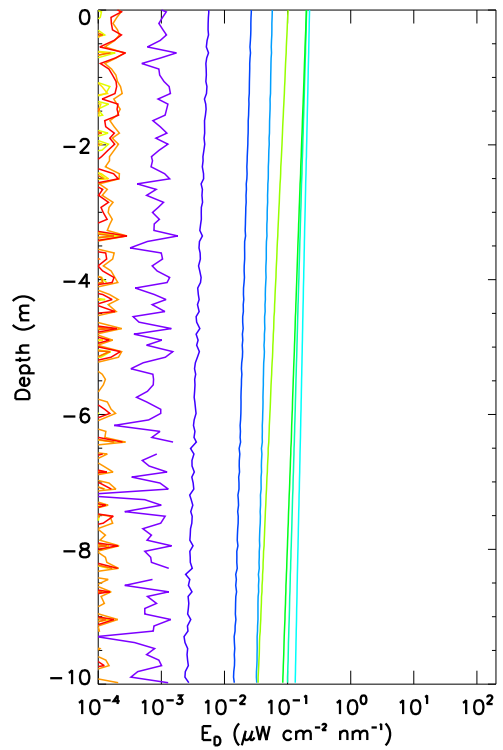
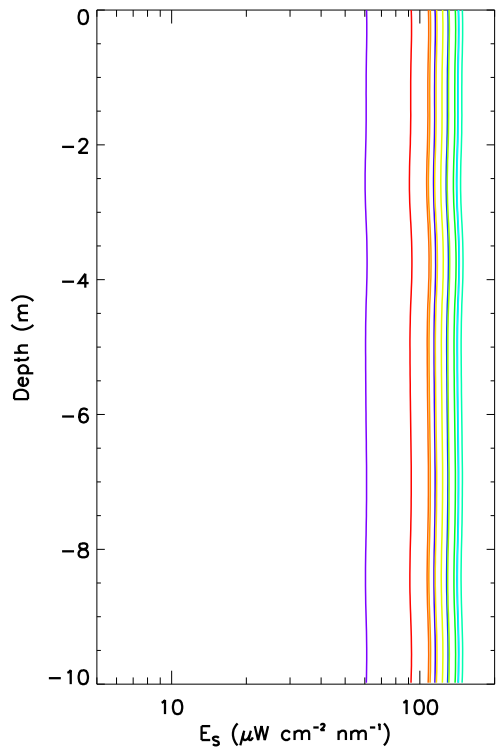
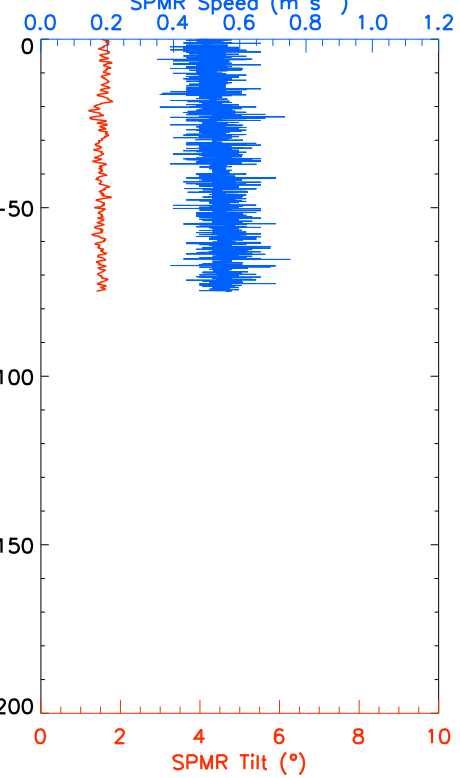
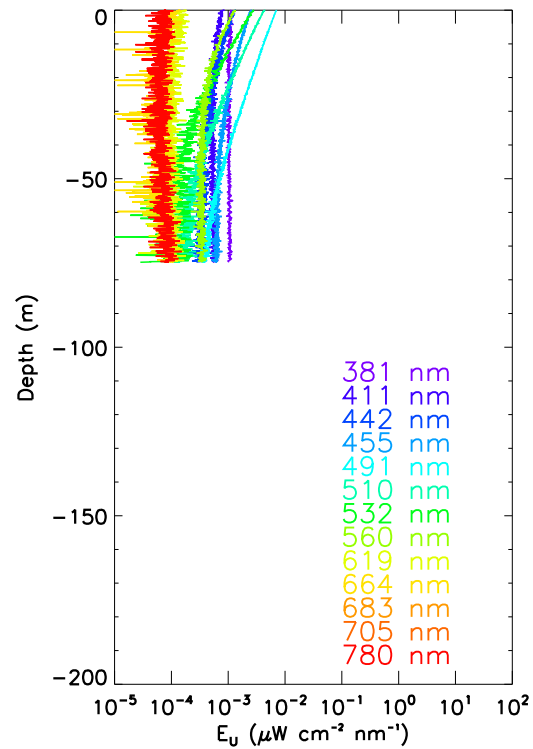
Boussole#97



B97_Bou250410AD



11:28 UTC

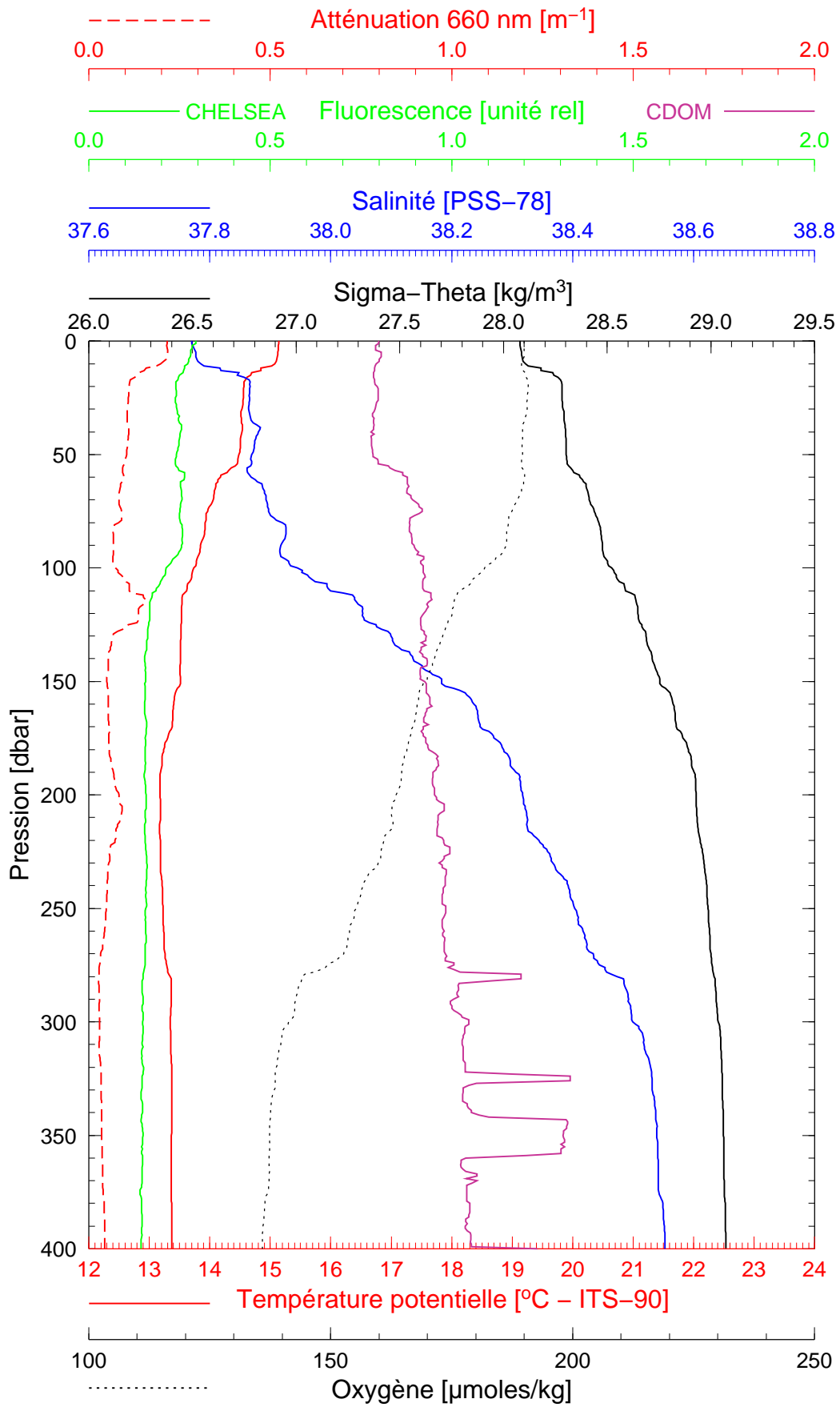


BOUSSOLE 97

24/04/2010

BOUS100424_01

BOUS001



Date 24/04/2010

Latitude 43°38.965

Heure déb 05h 38min [TU]

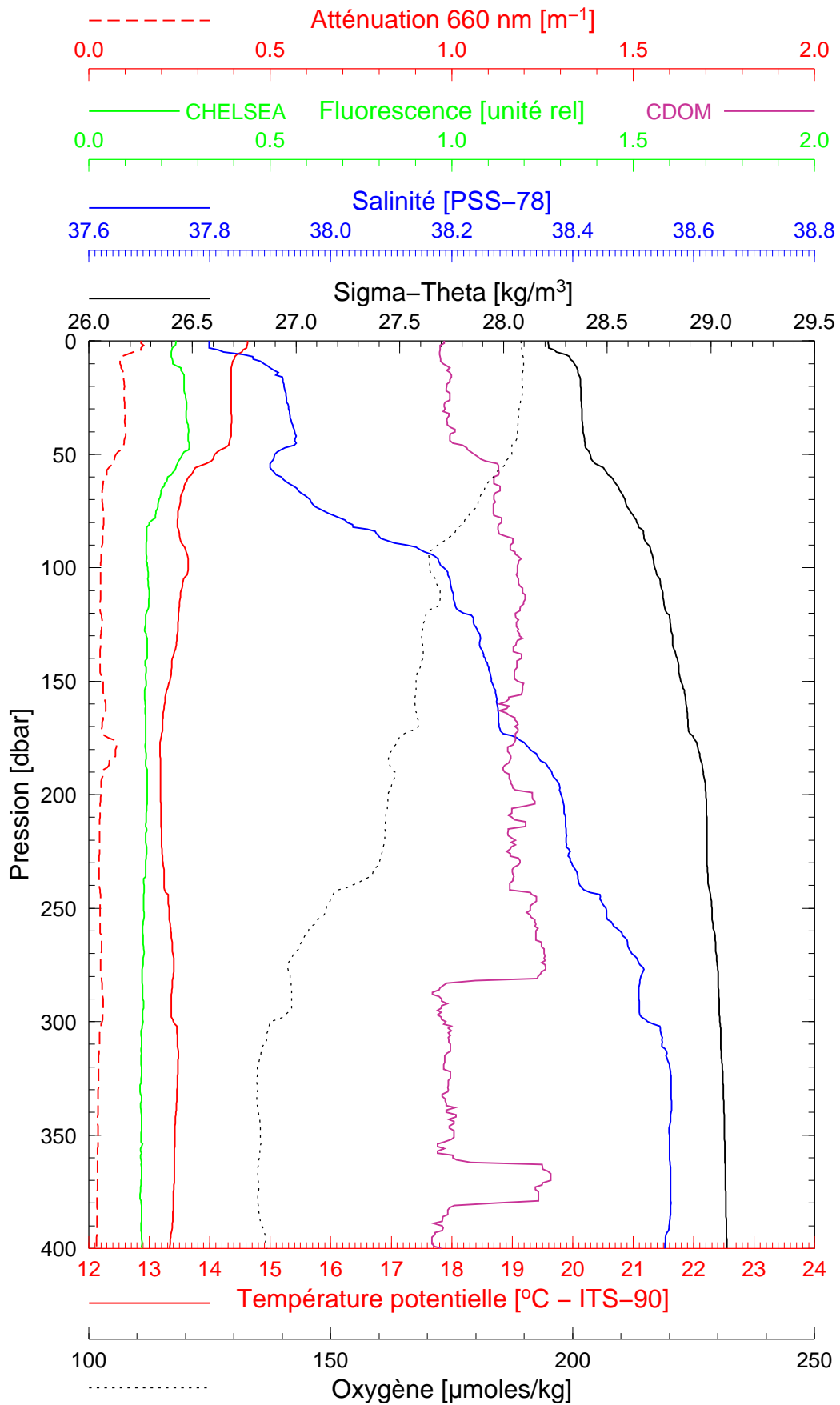
Longitude 07°21.022

BOUSSOLE 97

24/04/2010

BOUS100424_02

BOUS002



Date 24/04/2010

Latitude 43°36.999

Heure déb 06h 35min [TU]

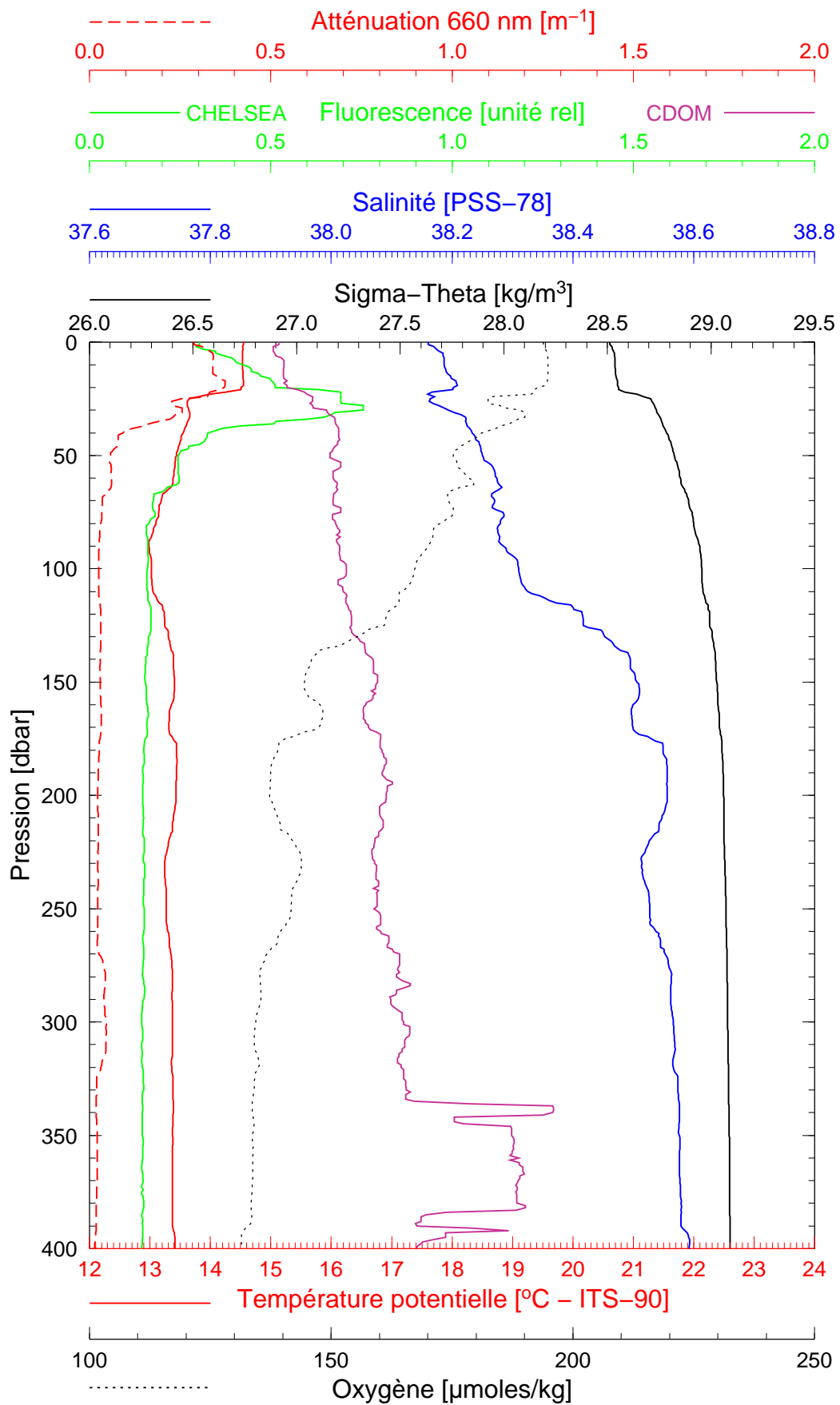
Longitude 07°24.963

BOUSSOLE 97

24/04/2010

BOUS100424_03

BOUS003



Date 24/04/2010

Latitude 43°33.974

Heure déb 07h 37min [TU]

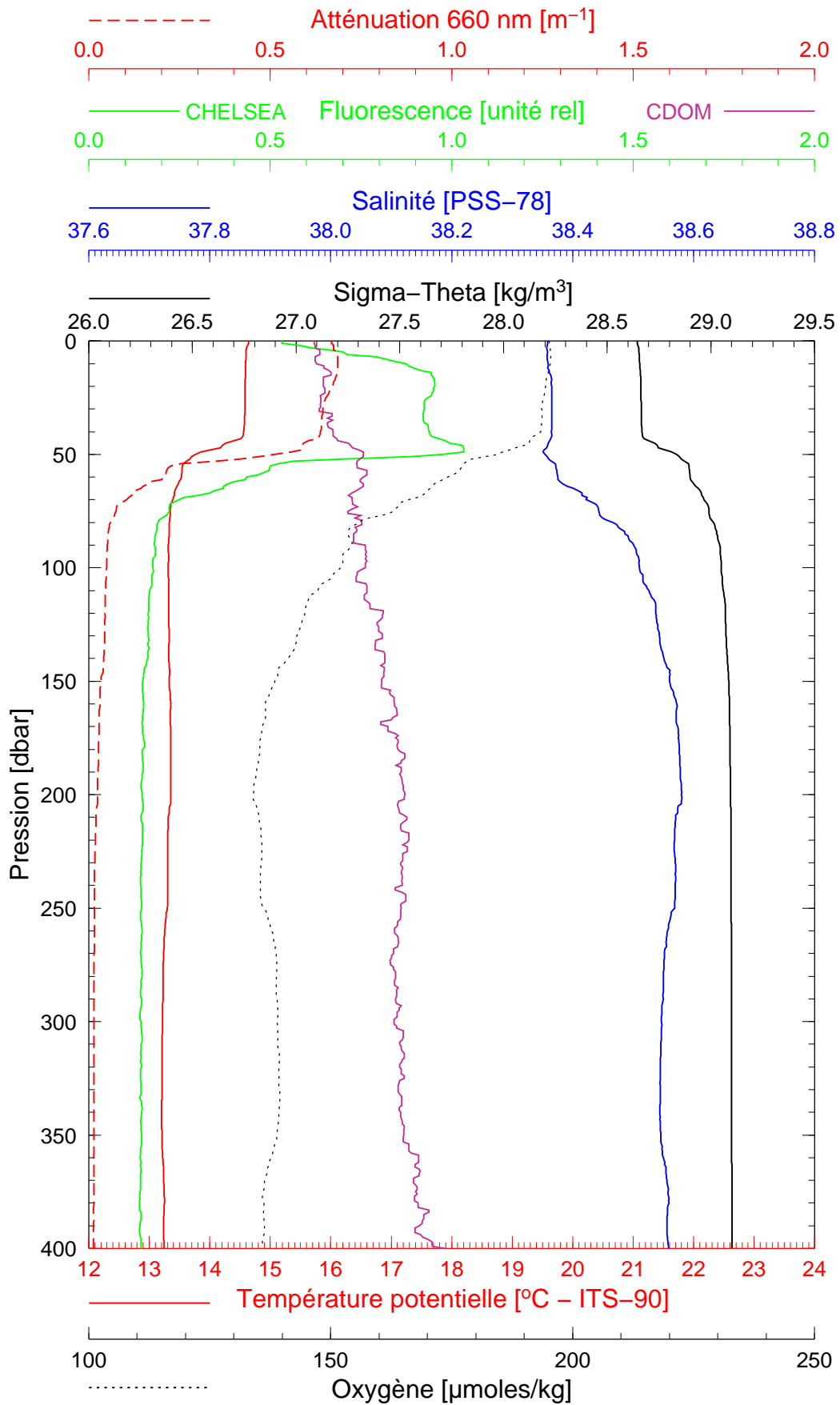
Longitude 07°30.960

BOUSSOLE 97

24/04/2010

BOUS100424_04

BOUS004



Date 24/04/2010

Latitude 43°31.001

Heure déb 08h 51min [TU]

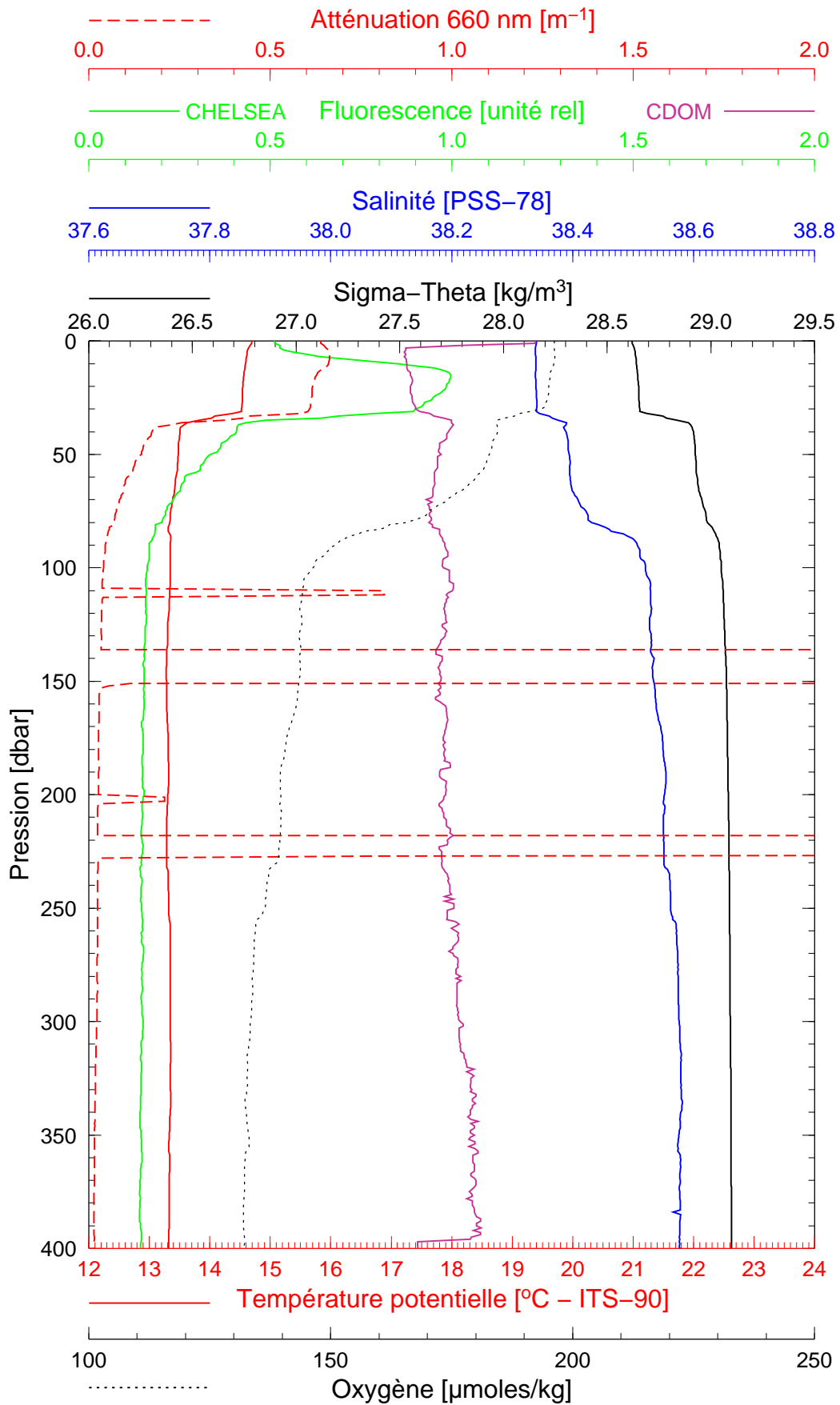
Longitude 07°36.972

BOUSSOLE 97

24/04/2010

BOUS100424_05

BOUS005



Date 24/04/2010

Latitude 43°28.047

Heure déb 09h 42min [TU]

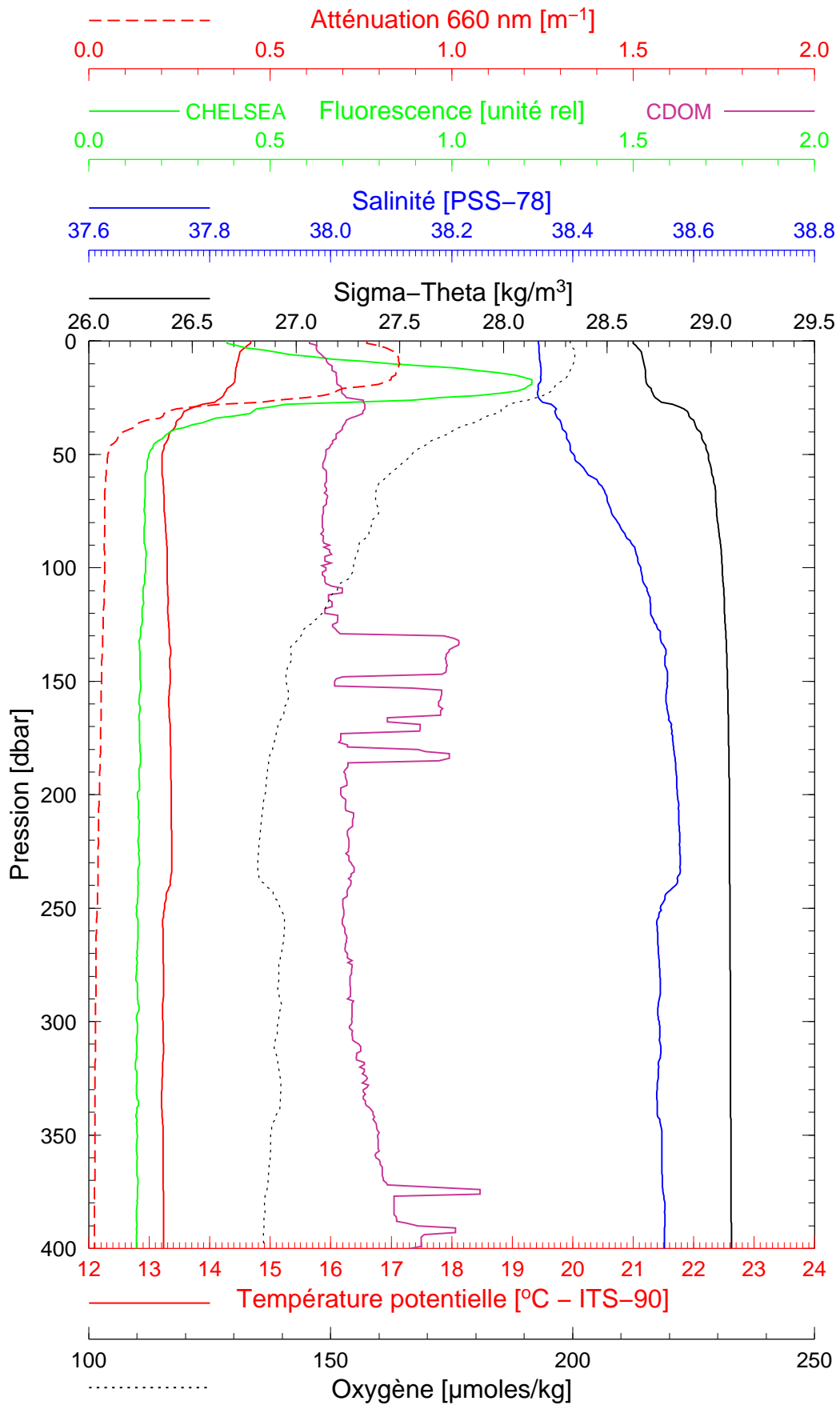
Longitude 07°41.992

BOUSSOLE 97

25/04/2010

BOUS100425_01

BOUS006



Date 25/04/2010

Heure déb 12h 10min [TU]

Latitude 43°22.138

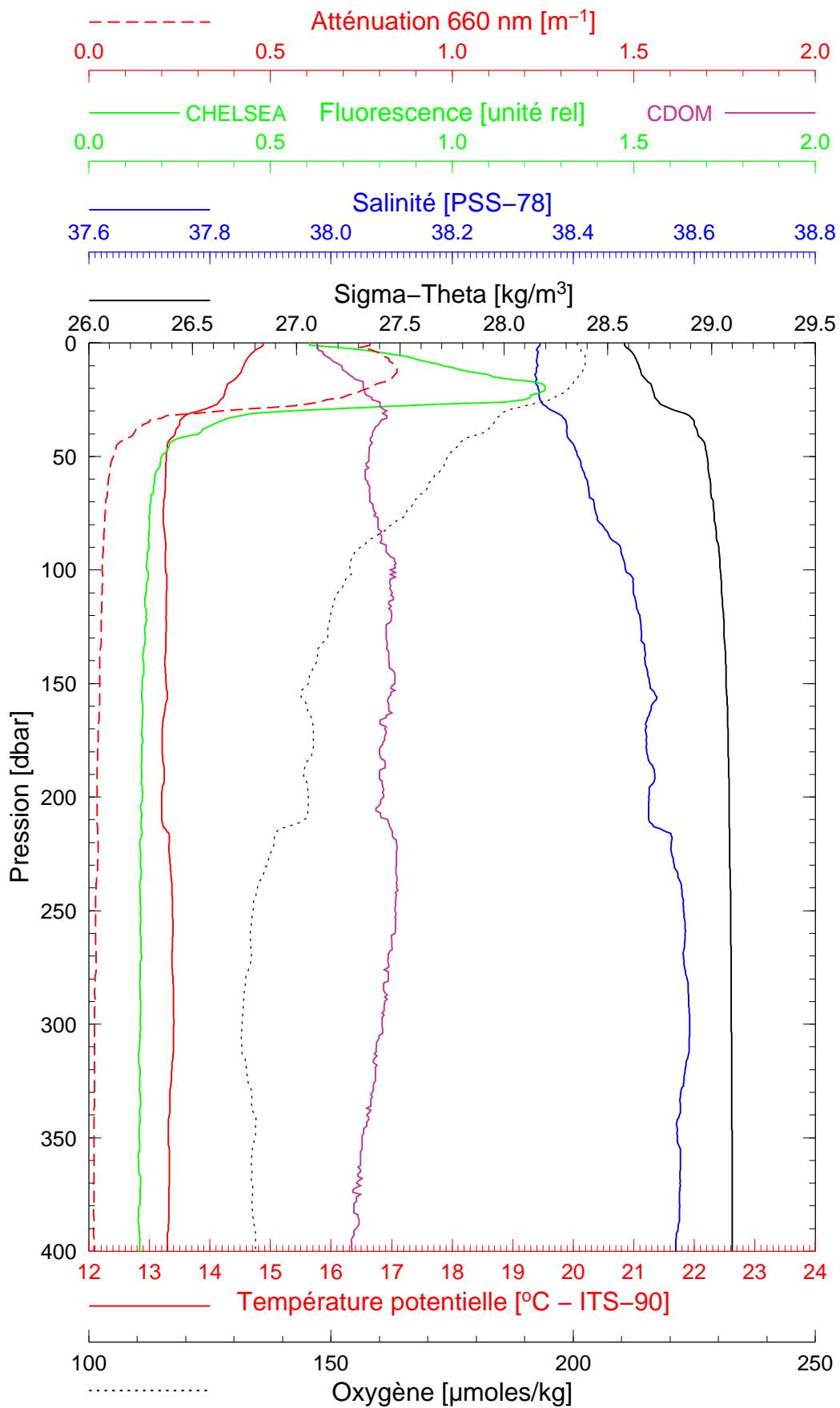
Longitude 07°54.140

BOUSSOLE 97

25/04/2010

BOUS100425_02

BOUS007



Date 25/04/2010

Heure déb 16h 05min [TU]

Latitude 43°24.998

Longitude 07°47.984