

BOUSSOLE Monthly Cruise Report

Cruise 96

March 29 – April 02, 2010

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

Vessel: R/V Téthys II

(Captain: Rémy Lafond then Alain Stephan)

Science Personnel: Matthieu Bressac, Emilie Diamond, Yves Lamblard, Edouard Leymarie, David Luquet, Grigor Obolensky, Didier Robin, Vincent Taillandier, Vincenzo Vellucci.

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



Figure 1. Rough conditions from 30th March 2010.

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

April 10, 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 October 2009 to March 2010, another SPMR will be used for profiles (SN 008 instead of SN 006). It will measure upwelling radiance and downward irradiance instead of upward and downward irradiance. The reference will also be another SMSR (SN 021 instead of 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 gimbal 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 first day, a Biospherical's C-OPS (Compact Optical Profiling System) have been tested on 0-100 m at the BOUSSOLE site to perform optical profiles and to compare them with SPMR measurements. Edouard Leymarie was also on board this day to test his CamLum, a new multi-spectral radiance camera, which is able to measure simultaneously the radiance in all direction over one hemisphere. Since the 23rd of March 2010, the buoy did not send any data. Changing the micro drive of Dacnet was a priority when divers were on board.

Cruise Summary

Only the first and the last cruise days were used, because of the bad weather during the rest of the cruise. The first day was used for optical and CTD casts with sampling at the BOUSSOLE site, for testing the C-OPS and for completing partly the transect. The last day was used for diving operations and CTD cast.

Monday 29 March 2010

The first day, weather conditions were good (H1/3 0.7 m, blue to overcast sky and good visibility). When arrived on site, 3 SPMR profiles and 1 Secchi disk were performed. 1 CTD cast was also performed but its pump did not work well so another CTD cast with water sampling was done but the data were just a little bite better. Then the Biospherical's C-OPS was tested near the surface to balance E_D and E_U sensors tilt and was dropped to 100 m to perform 3 optic profiles. After 4 other CTD casts were performed without pump problem on the transect between the site and the port of Nice.

Tuesday 30 March 2010

Bad weather prevented departure from the Nice port.

Wednesday 31 March 2010

Bad weather prevented departure from the Nice port.

Thursday 01 April 2010

Changing of the Téthys II crew.

Friday 02 April 2010

The last day, weather conditions were not optimal the morning, (H1/3 1.0 to 1.5 m, wind speed 11 kn, blue sky and good visibility) and were too rough from noon (H1/3 1.5 to 2.0 m) to work. When arrived on site, divers went at sea to take off the Dacnet and bring on board to change the micro drive of Dacnet with a new one. During this time, but the captain judged that sea conditions became to dangerous for people on the zodiac so the download was stopped before finished and people came back on board.

Cruise Report

Monday 29 March 2010 (UTC)

People on board: Matthieu Bressac, Emilie Diamond, Edouard Leymarie and Grigor Obolensky.

- 0535 Departure from the Nice port.
- 0850 Arrival at the BOUSSOLE site.
- 0855 SPMR 01, 02, 03 and CamLum measurements in parallel.
- 0955 Secchi disk 01 (9 m).
- 1000 CTD 01_0 (renamed CTD 000), 400 m.
- 1035 CTD 01, 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.
- 1100 Filtrations.
- 1145 C-OPS tests.
- 1220 C-OPS 01, 02, 03 and CamLum measurements in parallel.
- 1305 Departure to the second transect station.
- 1400 CTD 02, 400 m, station 02 (43°28'N 07°42'E).
- 1520 CTD 03, 400 m, station 04 (43°34'N 07°31'E).
- 1615 CTD 04, 400 m, station 05 (43°37'N 07°25'E).
- 1700 CTD 05, 400 m, station 06 (43°39'N 07°21'E).
- 1730 Departure to the Nice port.
- 1830 Arrival at the Nice port.

Tuesday 30 March 2010 (UTC)

Bad weather prevented departure from the Nice port.

Wednesday 31 March 2010 (UTC)

Bad weather prevented departure from the Nice port.

Thursday 01 April 2010

Changing of the Téthys II crew.

Friday 02 April 2010 (UTC)

People on board: Emilie Diamond, Yves Lamblard, David Luquet, Grigor Obolensky, Didier Robin, Vincent Taillandier and Vincenzo Vellucci.

- 0415 Departure from the Nice port.
- 0730 Arrival at the BOUSSOLE site.
- 0740 Diving 1 on the buoy for taking off the Dacnet.
On board substitution of the Dacnet micro drive: connection OK after substitution.
- 0820 CTD 06, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC and Ap.

0900 Filtrations.
0930 Secchi disk 02 (12 m).
1000 Diving 2 cancelled because of sea state.
1000 Departure to the Nice port.
1325 Arrival at the Nice port.

Problems identified during the cruise

- Bad weather prevented departure from Nice port the 2nd and the 3rd day and sea conditions were not optimal the last day, specially the afternoon.
- One SPMR fin was partly broken during its deployment the 1st day.
- The 1st day, the CTD did not work well because of the pump (CTD000 and CTD001). It was repaired on board before the transect casts. The CDOM sensor on the CTD also did not work during this mission.

Calculated Swath paths for the MERIS Sensor (ESOV Software)

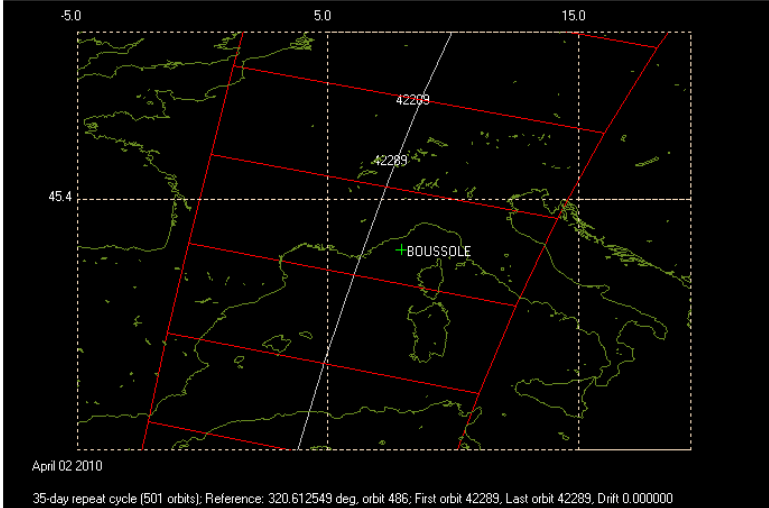
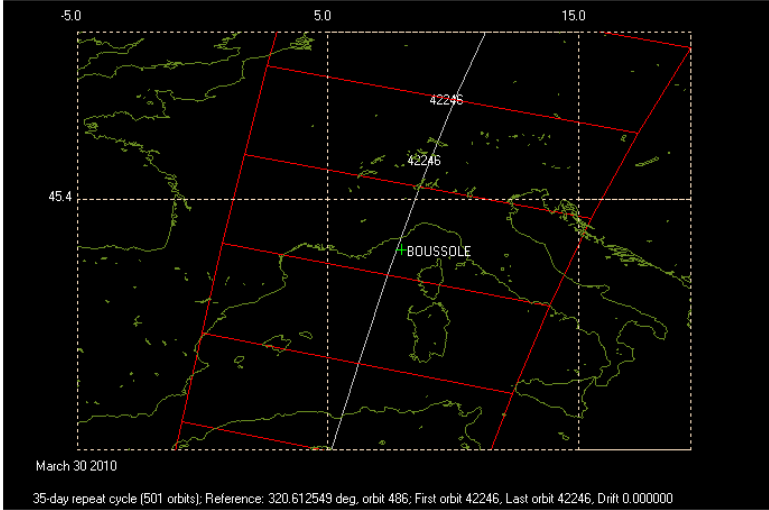


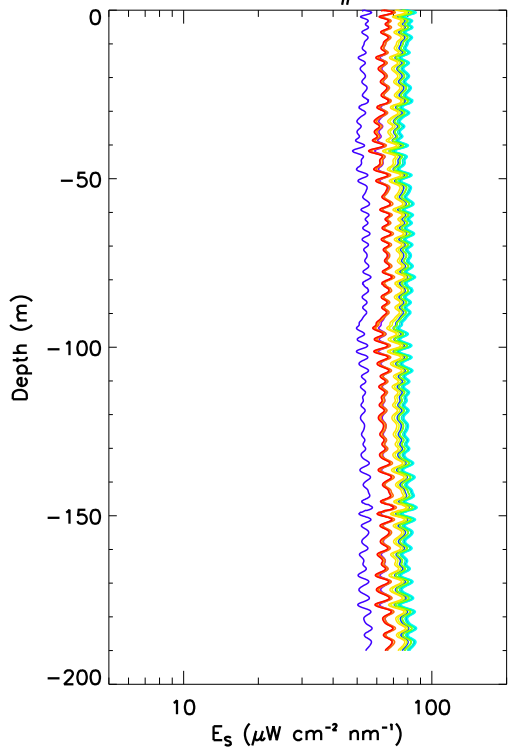
Figure 2. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for 30 March and 02 April 2010.

Appendix

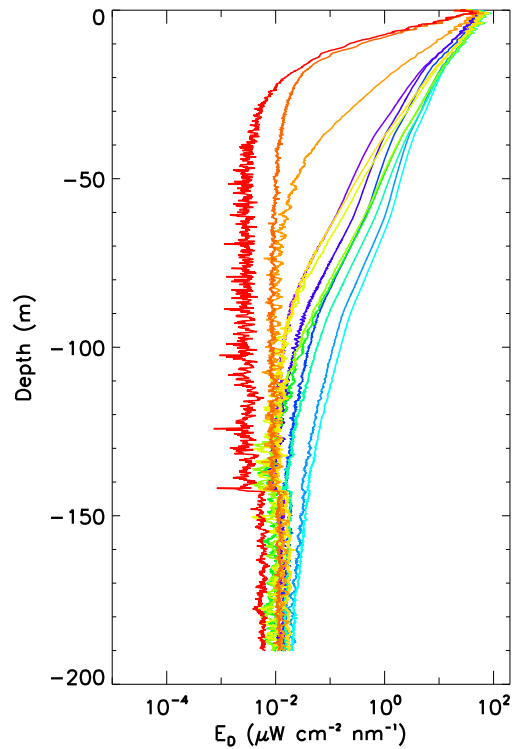
Cruise Summary Table for Boussole 96

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		Whitecaps		
								(Degree)	(Minute)	(Degree)	(Minute)	Wind sp. (kn)	Wind dir.				Sea Swell H (m)	Sea Swell dir.										
29/03/10	Bou290310black1				8:57	3:00																						
		Bou290310AC			9:11	4:12	190	43	22.216	7	53.259	blue	Cu & St	4	4	277	1015.4	85	good	13.7		calm		0.7		no		
		Bou290310AG			9:24	3:43	189	43	22.140	7	53.098	blue	Cu & St	4	4	277	1015.4	85	good	13.7		calm		0.7		no		
		Bou290310AH			9:35	3:52	173	43	22.067	7	52.927	blue	Cu & St	4	4	277	1015.4	85	good	13.7		calm		0.7		no		
		Bou290310black2			9:48	3:00																						
				Secchi01		9:55	3:00	9	43	22	7	54	overcast			5						good			calm			no
				CTDBOUS001_0 renamed		10:05	28:00	400	43	21.873	7	52.733	overcast			7	7	88	1015.2	86		13.7	13.8	calm			no	
				CTDBOUS000																								
				CTDBOUS001	HPLC, Ap, TSM & CDOM	10:38	26:00	400	43	21.703	7	52.693	overcast			7	8	88	1015.2	86		13.7	13.5	calm			no	
		bou c-ops 100329 1218 001				12:20	3:00																					
			bou c-ops 100329 1218 003			12:36	1:30	45	43	22.025	7	53.055	blue	Cu & St	2	8	261	1014.0	86	good	13.7		calm		0.8		few	
			bou c-ops 100329 1218 004			12:42	3:00	100	43	22.006	7	52.888	blue	Cu & St	2	8	261	1014.0	86	good	13.7		calm		0.8		few	
			bou c-ops 100329 1218 005			12:50	2:30	85	43	22.028	7	52.778	blue	Cu & St	2	8	261	1014.0	86	good	13.7		calm		0.8		few	
		bou c-ops 100329 1218 006				13:00	4:00																					
				CTDBOUS002		14:05	26:00	400	43	27.954	7	41.742	overcast			7	5	178	1013.8	84		13.9	14.4	calm			no	
			CTDBOUS003		15:25	24:00	400	43	34.109	7	30.584	overcast			7	2	98	1013.1	81		13.6	14.0	calm			no		
			CTDBOUS004		16:18	24:00	400	43	37.034	7	25.020	overcast			7	5	70	1012.7	82		13.6	14.1	calm			no		
			CTDBOUS005		17:04	25:00	400	43	39.024	7	20.963	overcast			7	9	30	1012.3	78		14.2	14.0	calm			no		
30/03/10																												
31/03/10																												
01/04/10																												
02/04/10			CTDBOUS006	HPLC & Ap	8:27	25:00	400	43	22.155	7	54.505	blue			2	11	50	1017.1	55		12.1	13.4	moved			yes		
				Secchi02	9:30	3:00	12	43	22	7	54	blue			2						good			moved			yes	

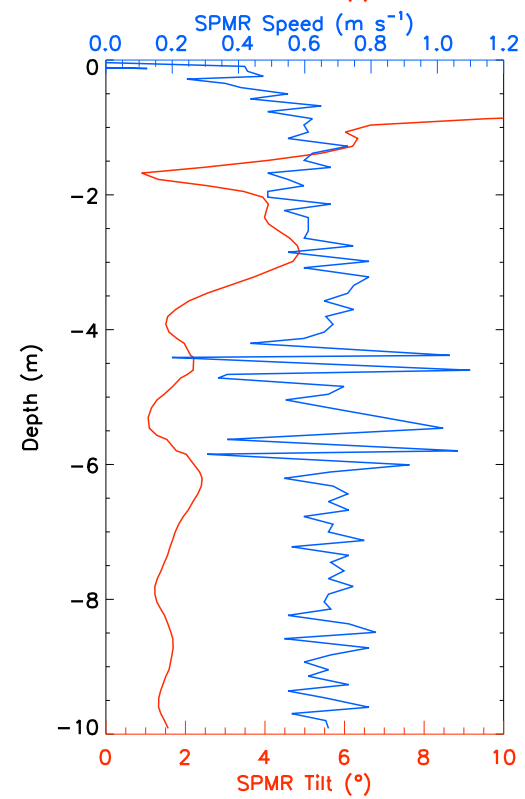
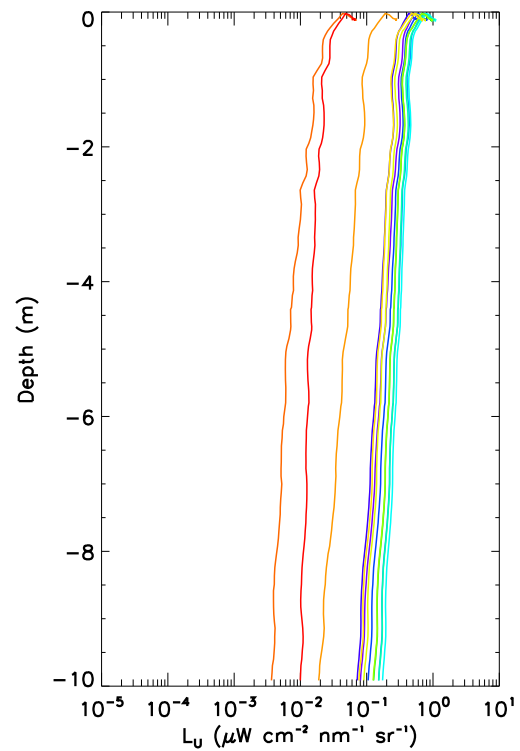
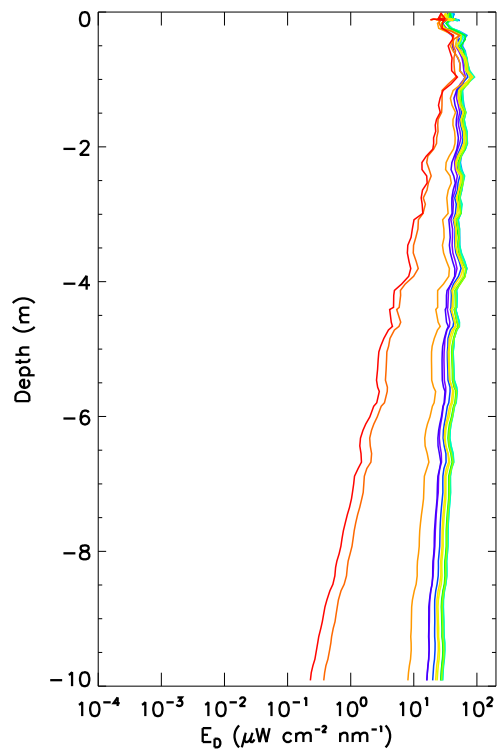
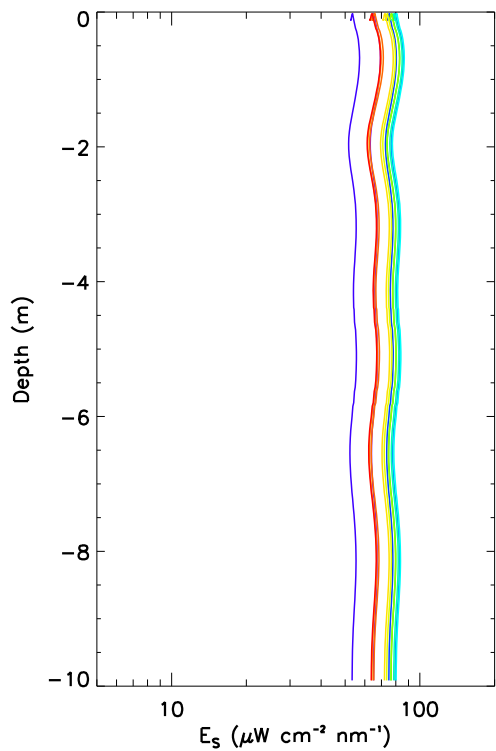
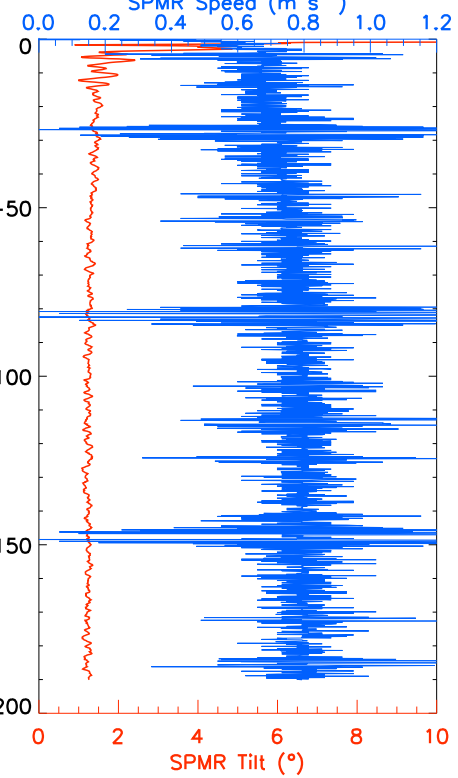
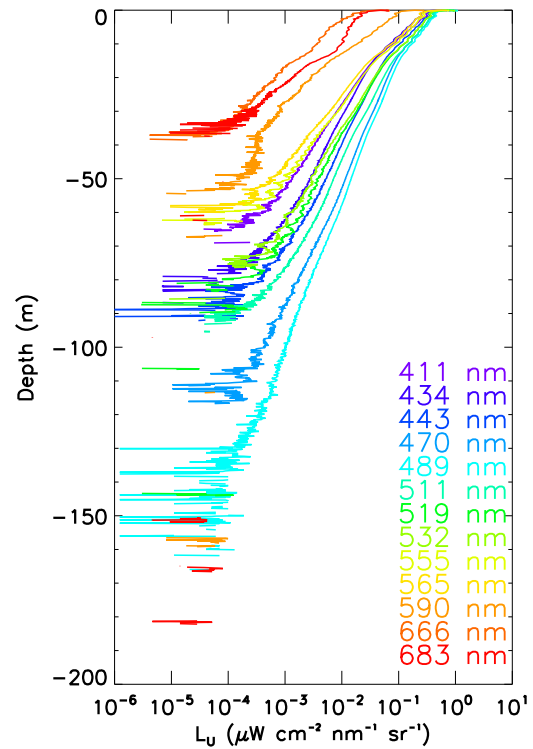
Boussole#96



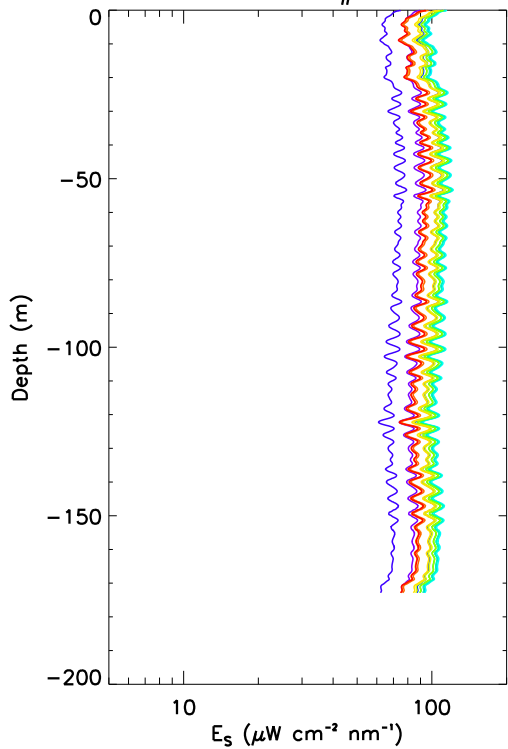
B96_Bou290310AC



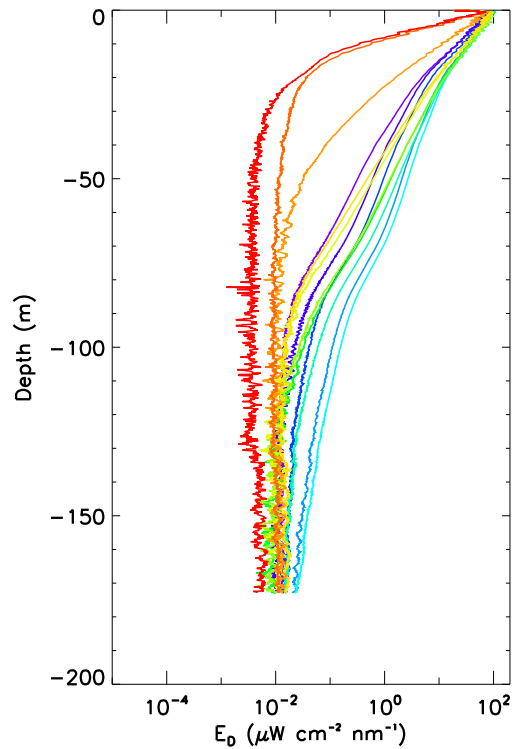
9:11 UTC



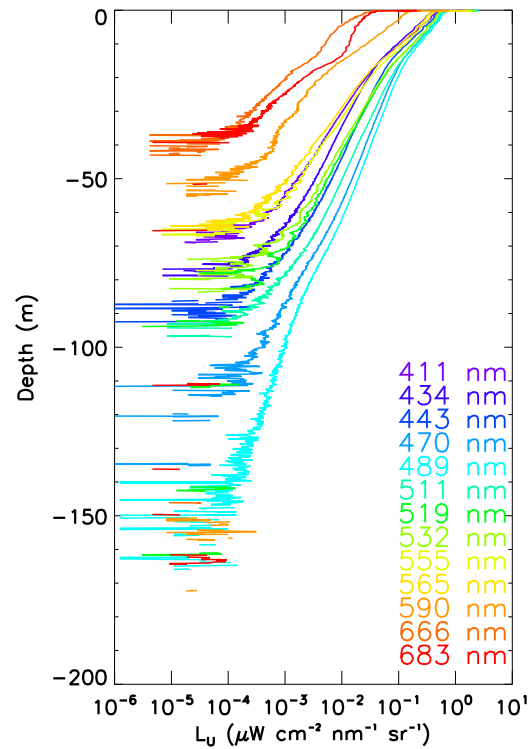
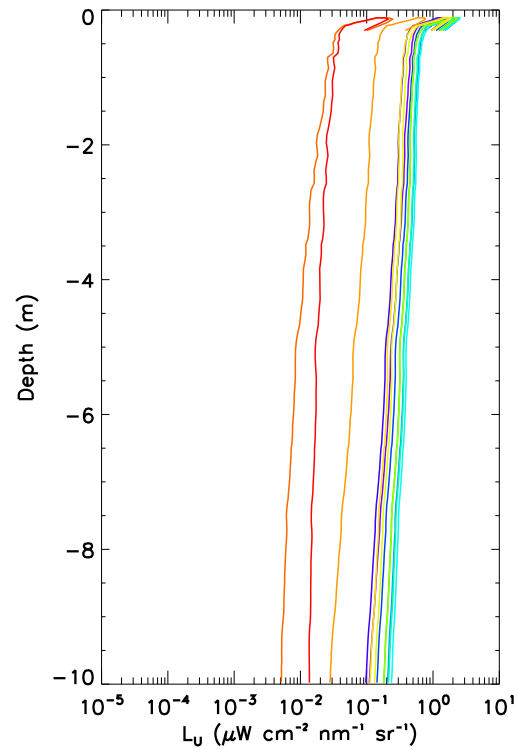
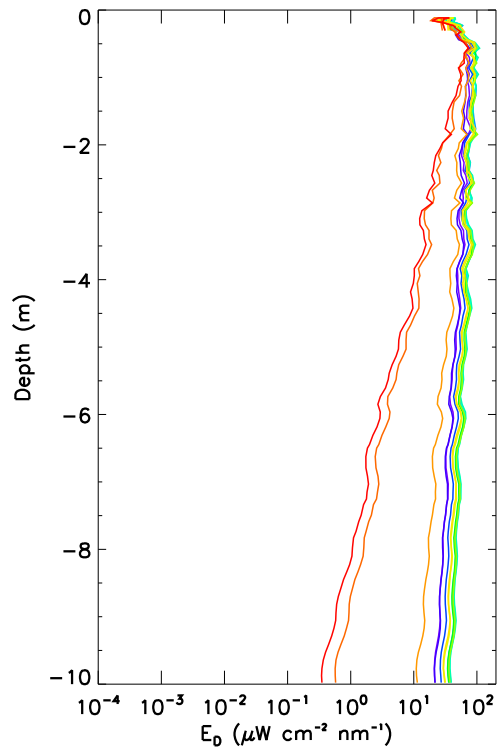
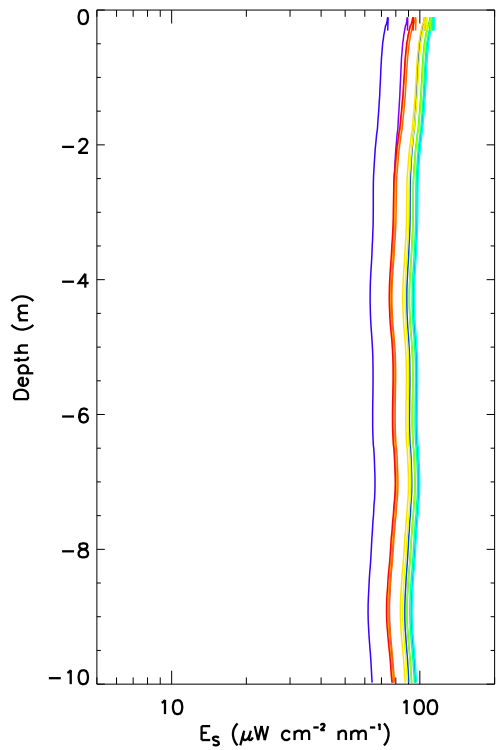
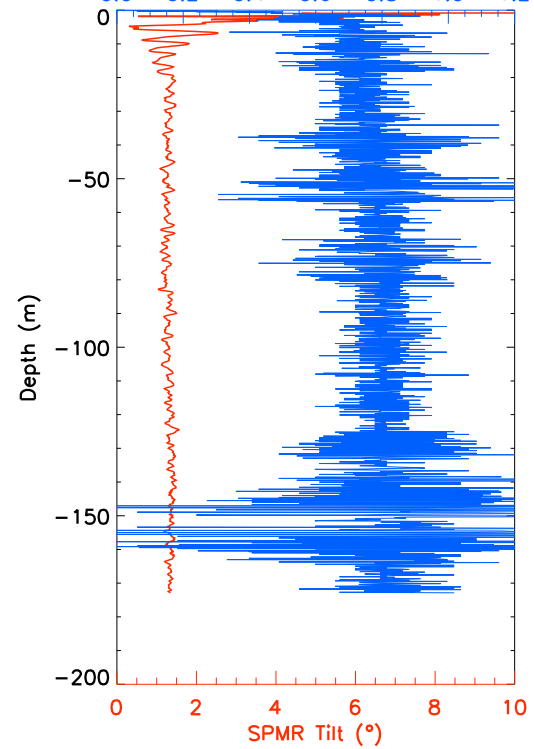
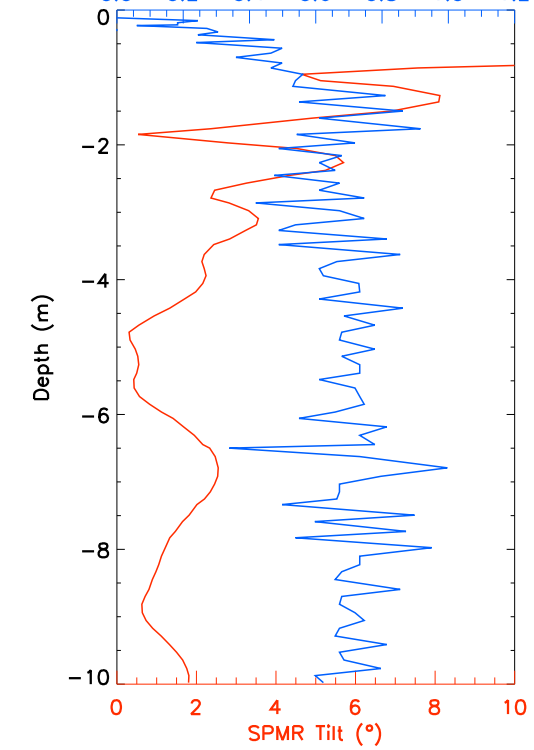
Boussole#96



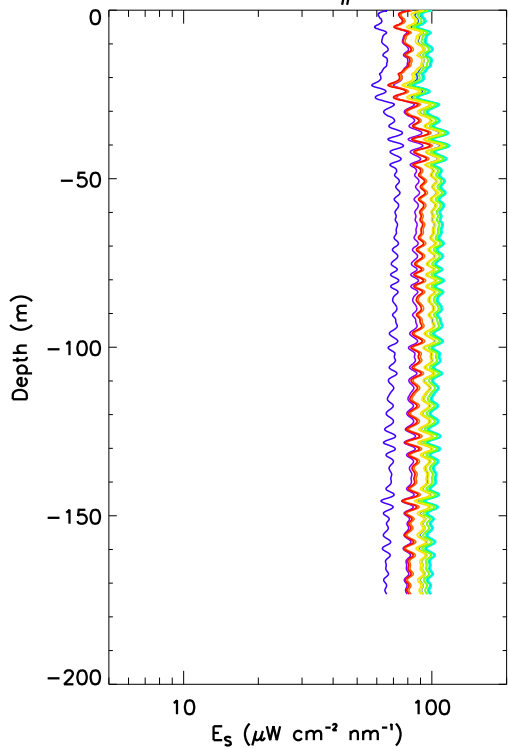
B96_Bou290310AG



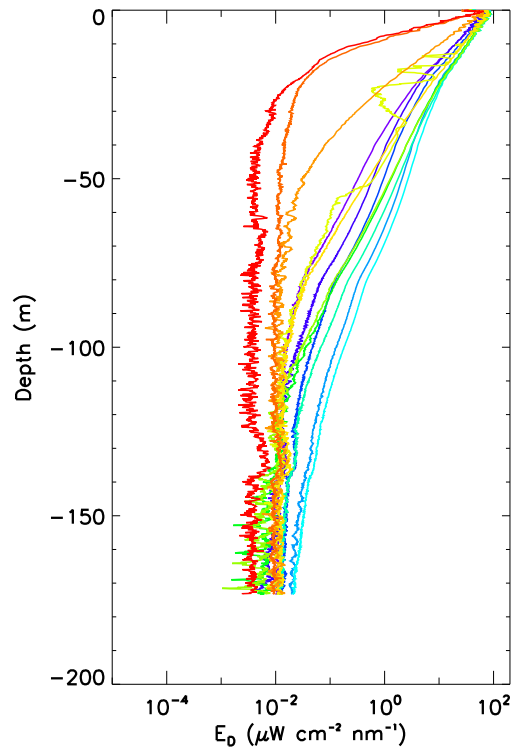
9:25 UTC

SPMR Speed (m s^{-1})SPMR Speed (m s^{-1})

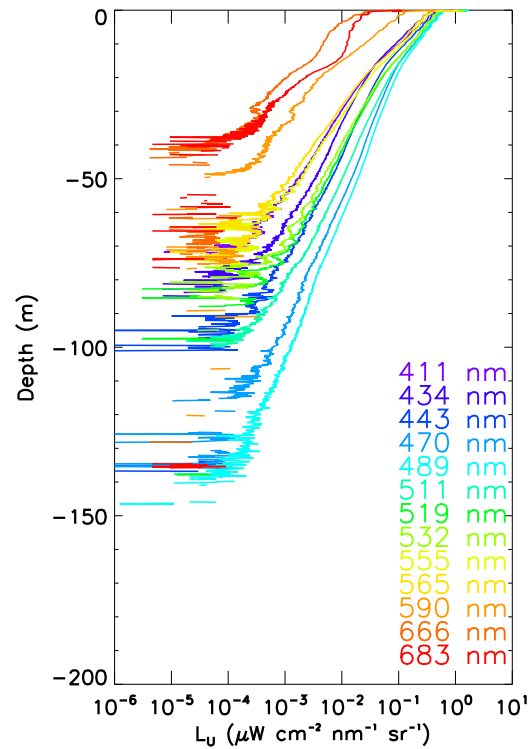
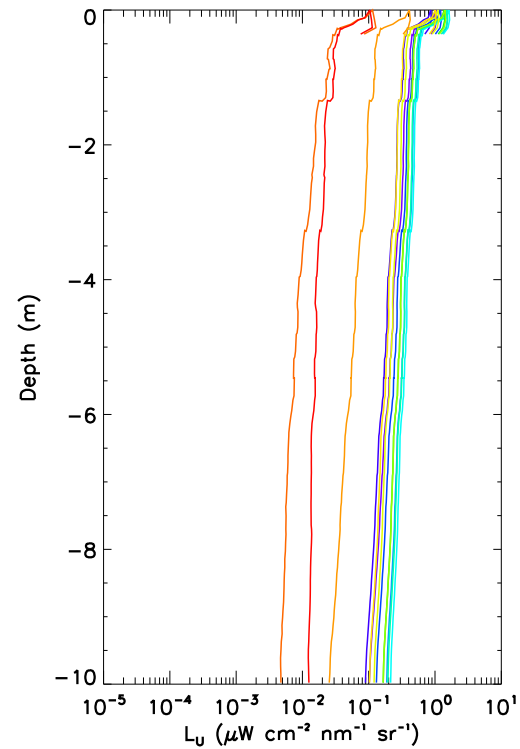
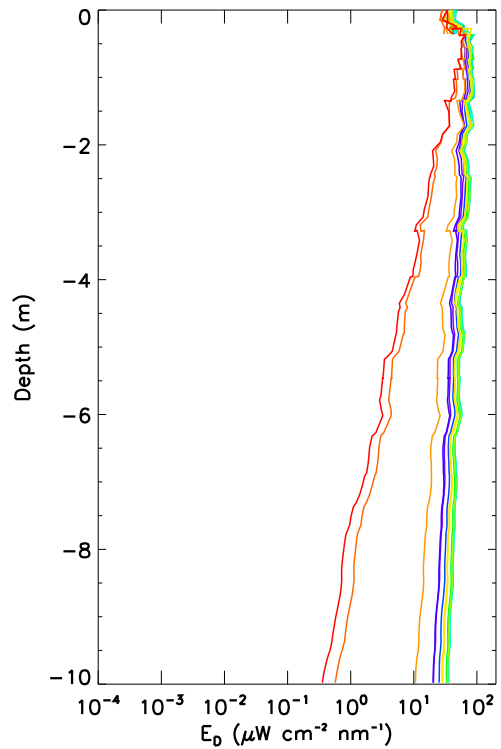
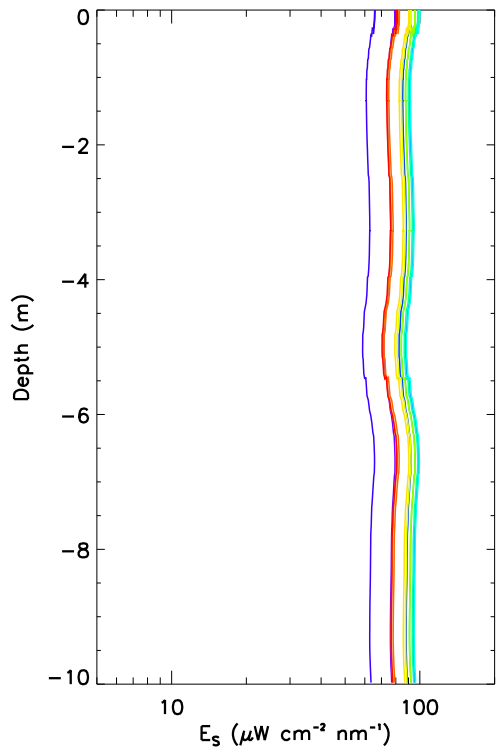
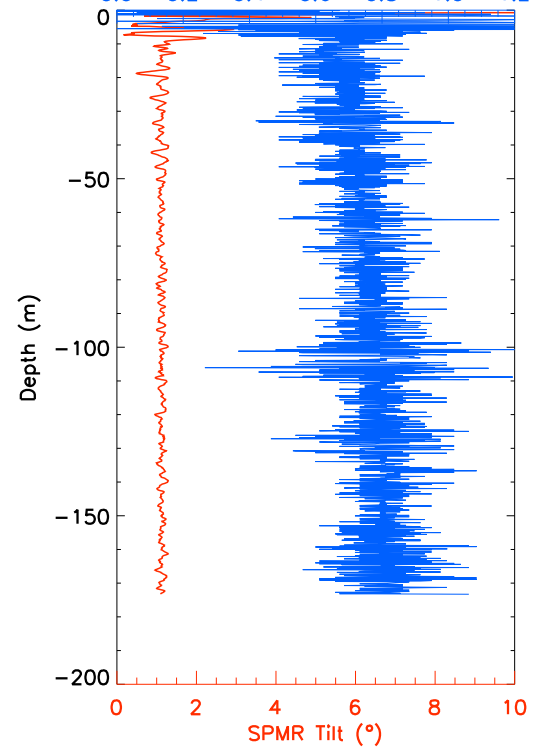
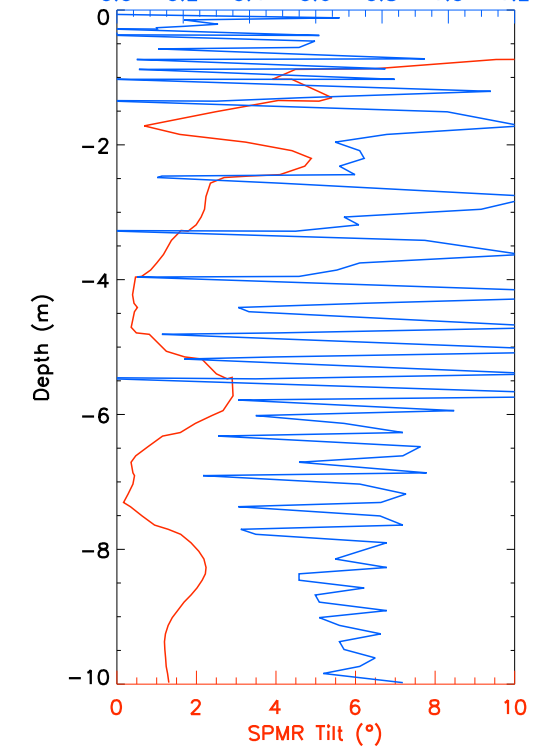
Boussole#96



B96_Bou290310AH



9:35 UTC

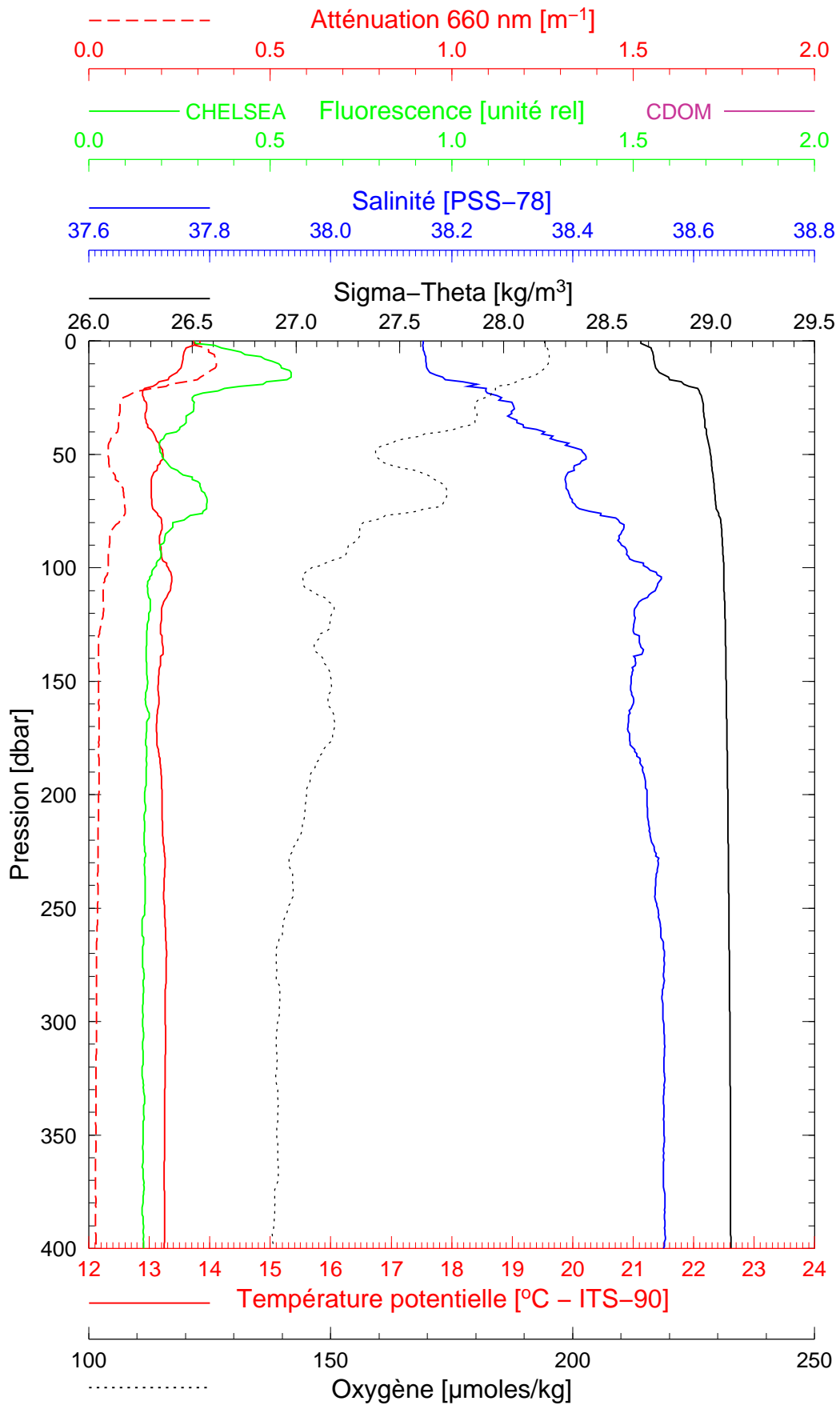
SPMR Speed (m s^{-1})SPMR Speed (m s^{-1})

BOUSSOLE 96

29/03/2010

BOUS100329_00

BOUS000



Date 29/03/2010
Heure déb 10h 05min [TU]

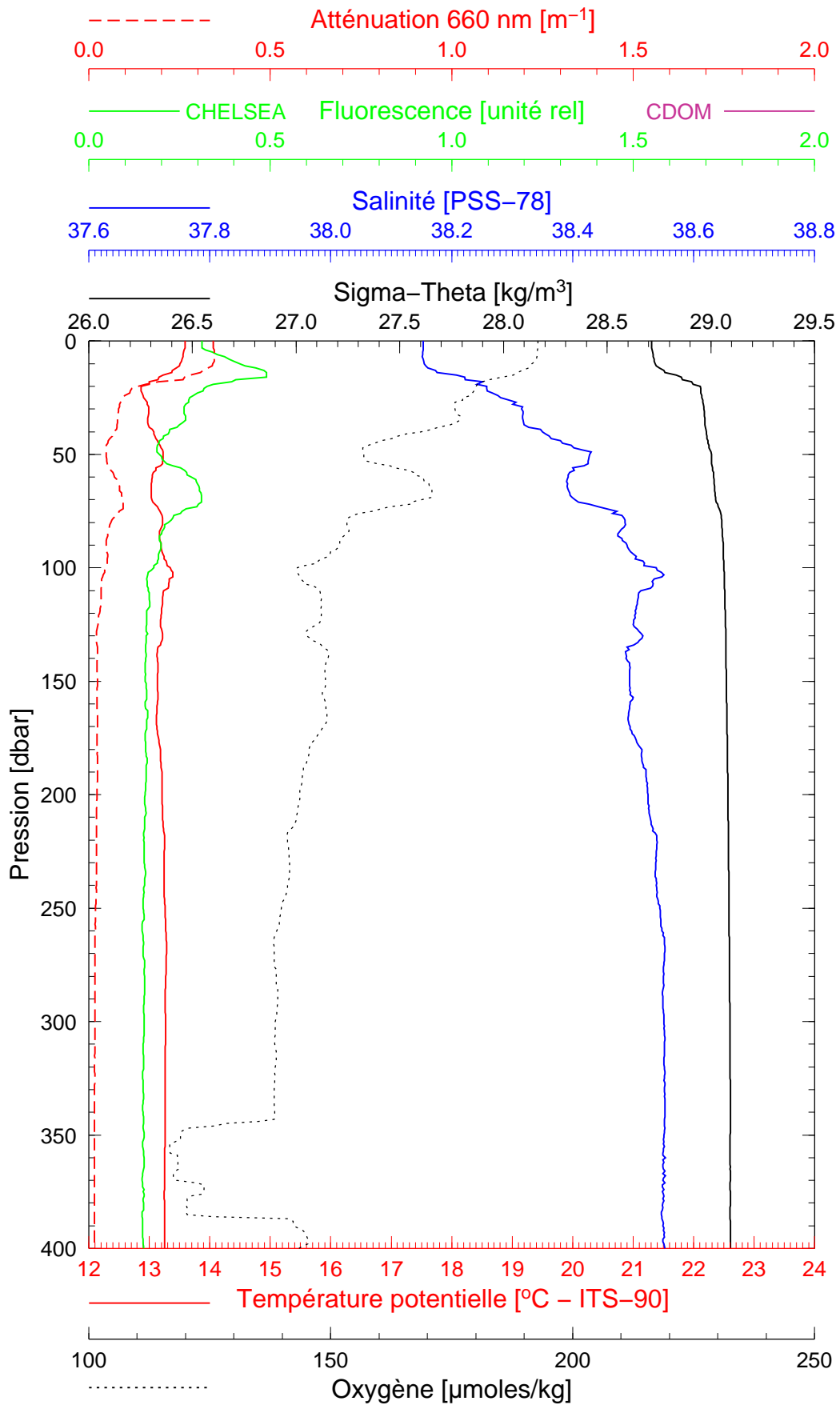
Latitude 43°21.873
Longitude 07°52.733

BOUSSOLE 96

29/03/2010

BOUS100329_01

BOUS001



Date 29/03/2010
Heure déb 10h 38min [TU]

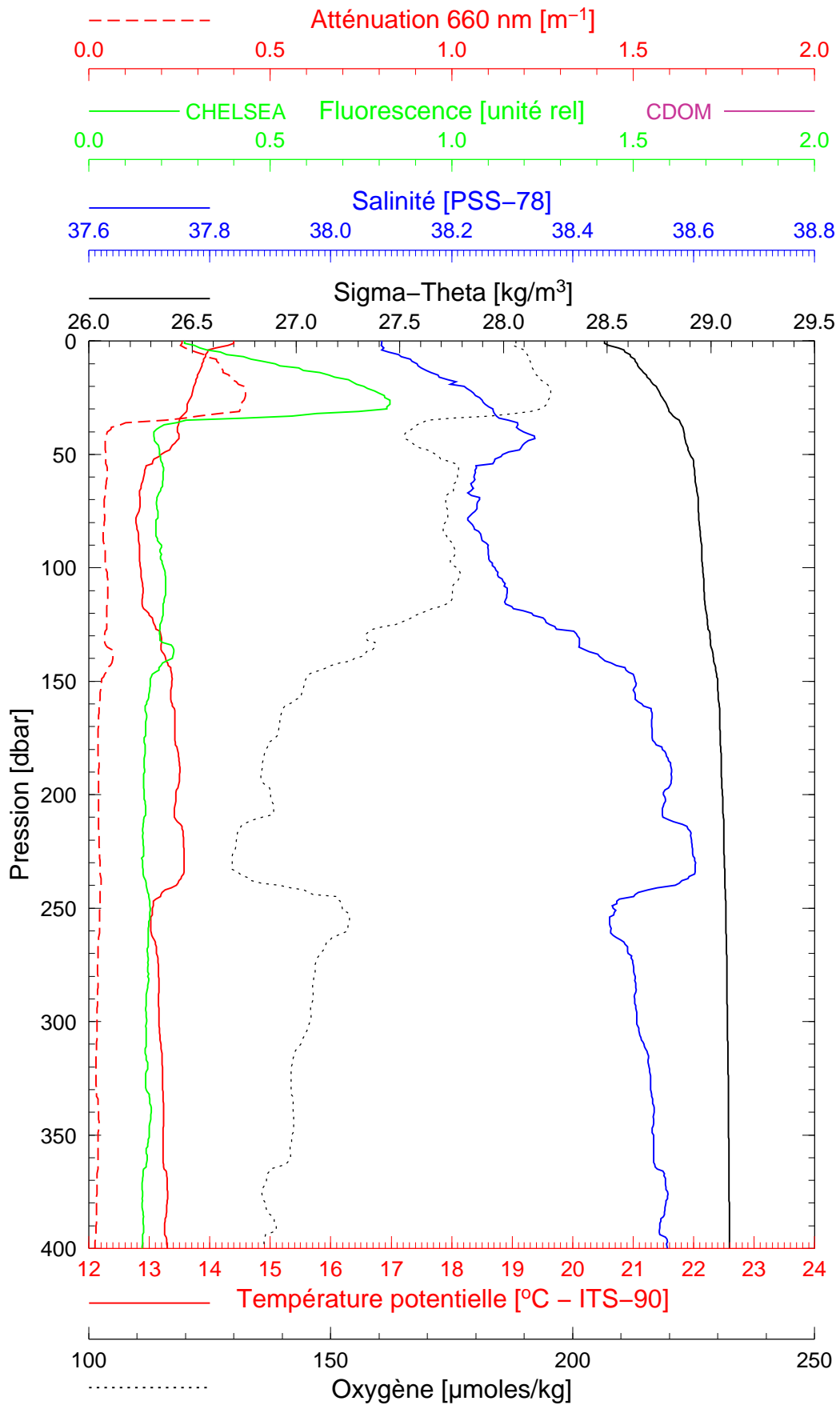
Latitude 43°21.703
Longitude 07°52.693

BOUSSOLE 96

29/03/2010

BOUS100329_02

BOUS002



Date 29/03/2010

Latitude 43°27.954

Heure déb 14h 05min [TU]

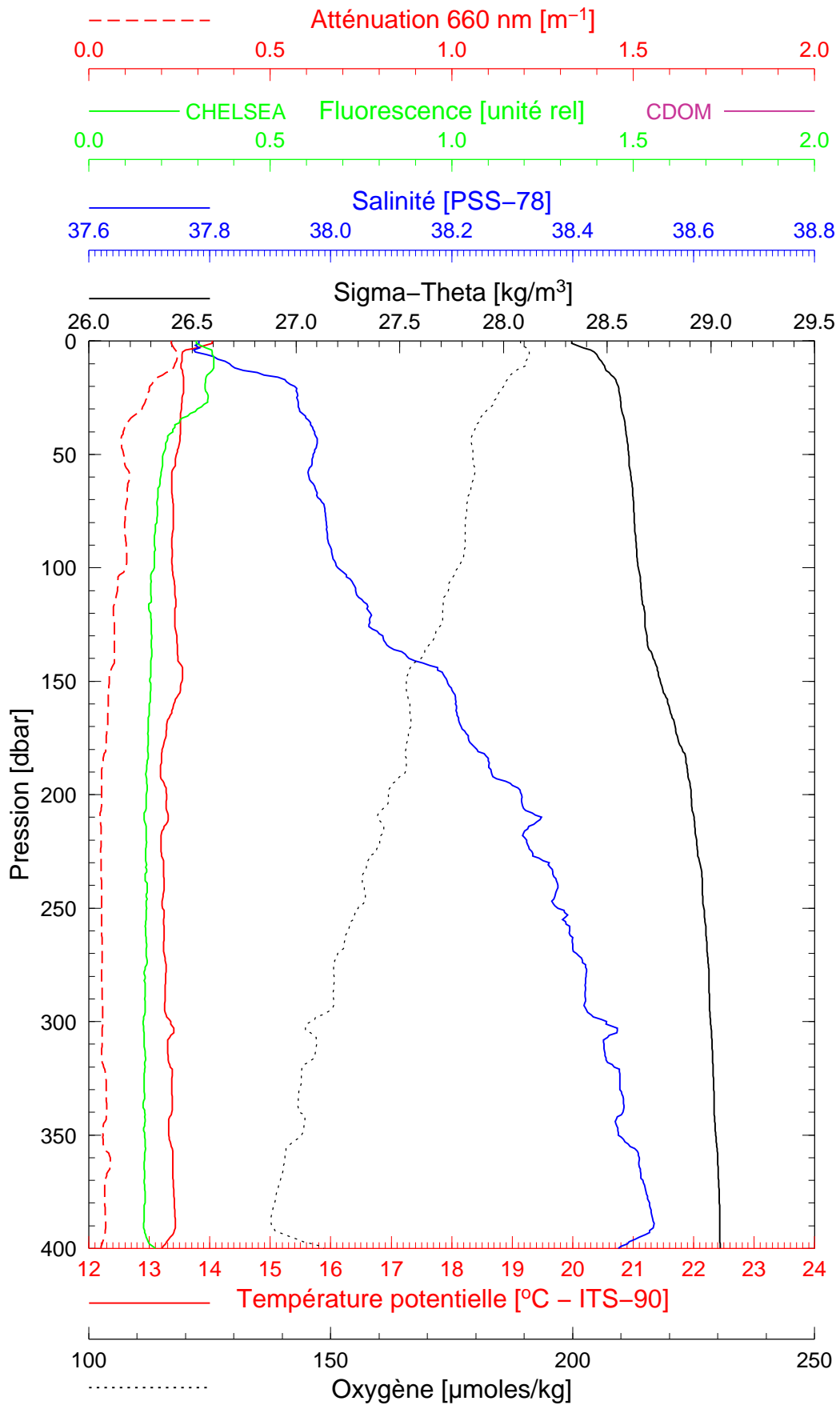
Longitude 07°41.742

BOUSSOLE 96

29/03/2010

BOUS100329_03

BOUS003



Date 29/03/2010
Heure déb 15h 25min [TU]

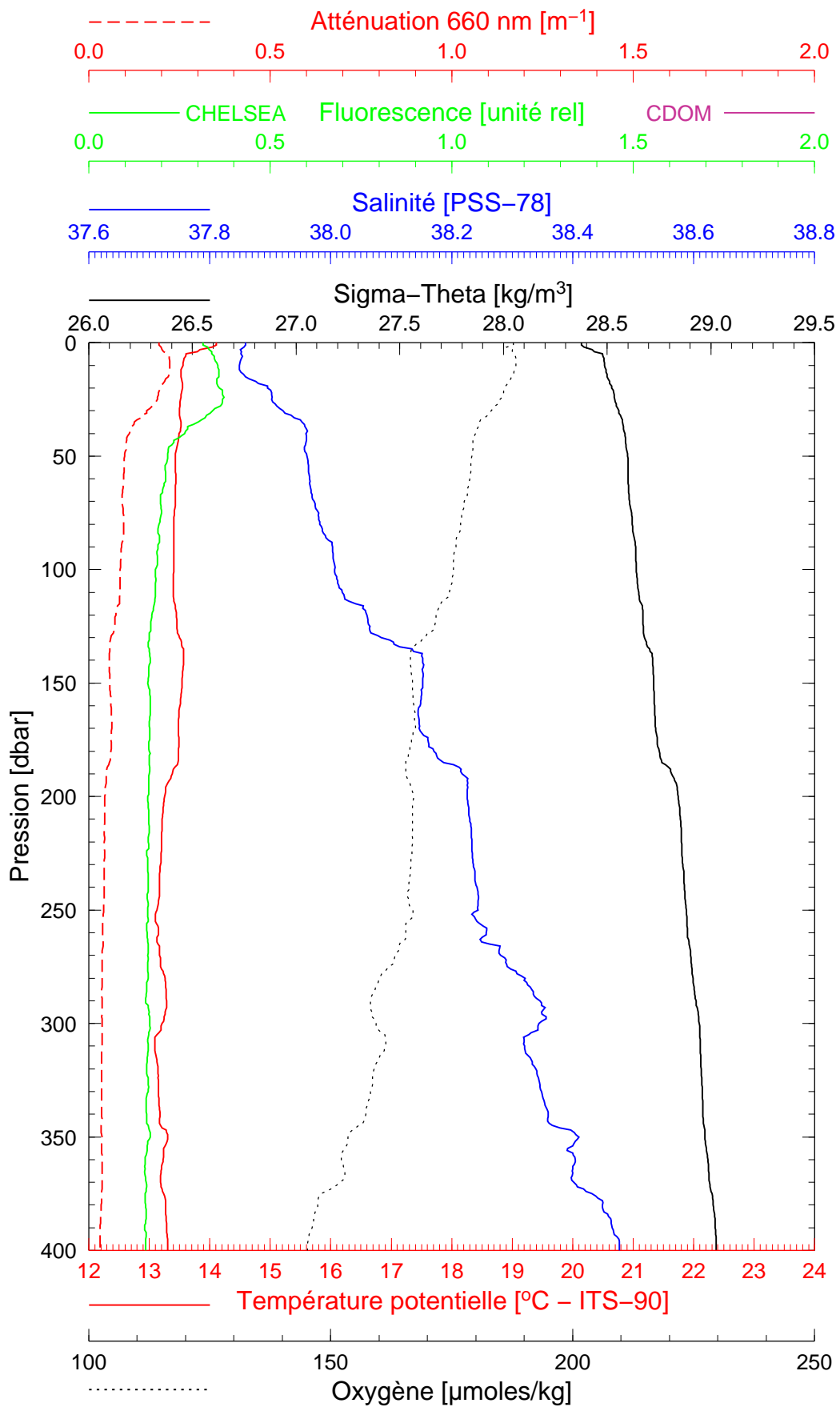
Latitude 43°34.109
Longitude 07°30.584

BOUSSOLE 96

29/03/2010

BOUS100329_04

BOUS004



Date 29/03/2010

Latitude 43°37.034

Heure déb 16h 18min [TU]

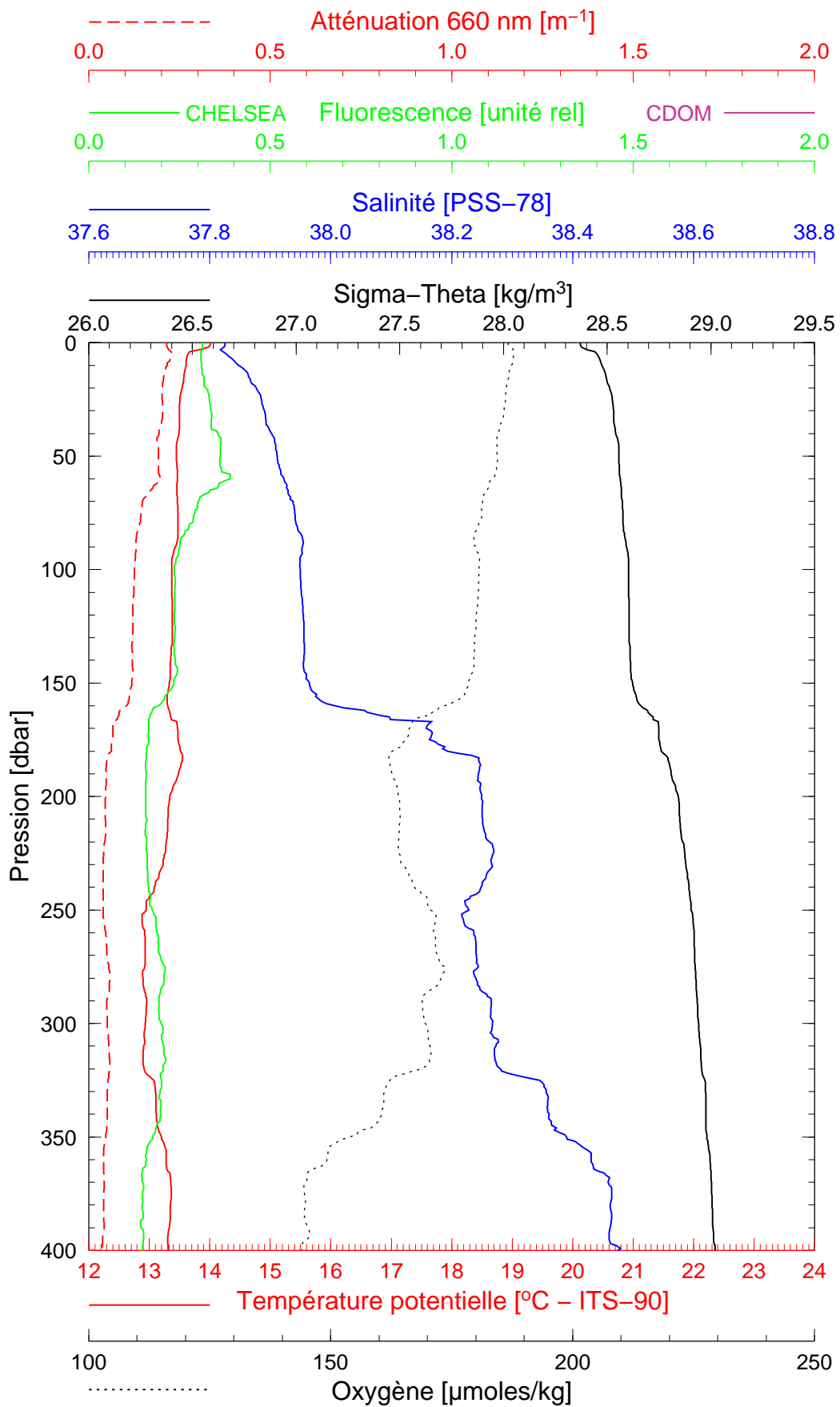
Longitude 07°25.020

BOUSSOLE 96

29/03/2010

BOUS100329_05

BOUS005



Date 29/03/2010

Latitude 43°39.024

Heure déb 17h 04min [TU]

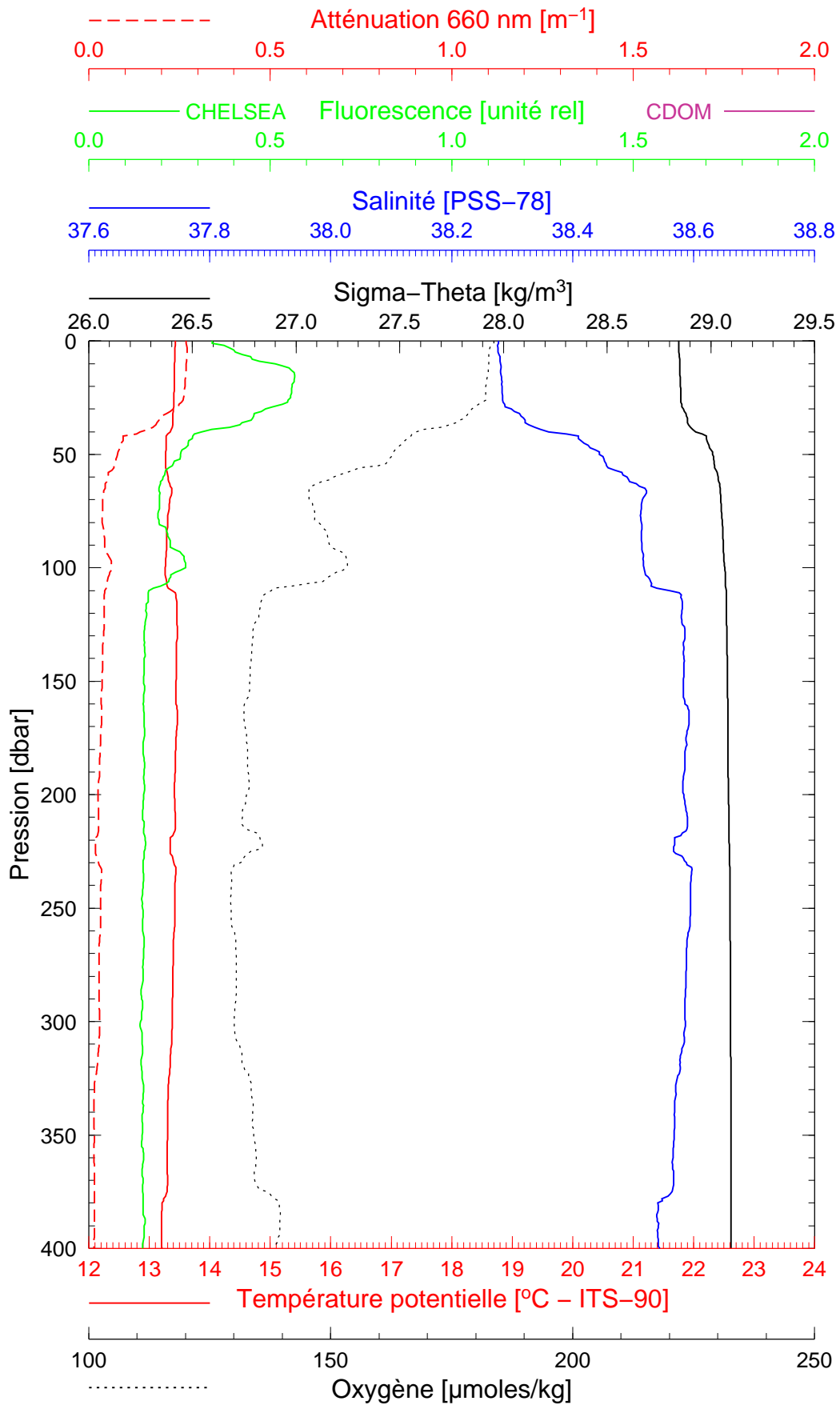
Longitude 07°20.963

BOUSSOLE 96

02/04/2010

BOUS100402_01

BOUS006



Date 02/04/2010

Latitude 43°22.155

Heure déb 08h 27min [TU]

Longitude 07°54.505