BOUSSOLE Monthly Cruise Report

Cruise 75
April 30 - May 2, 2008

Duty Chiefs: Vincenzo Vellucci (enzo@obs-vlfr.fr)
Vessel: R/V Téthys II
(Captain: Remy Lafond)

Science Personnel: François Bourrin, Grigor Obolensky, Vincenzo Vellucci.

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

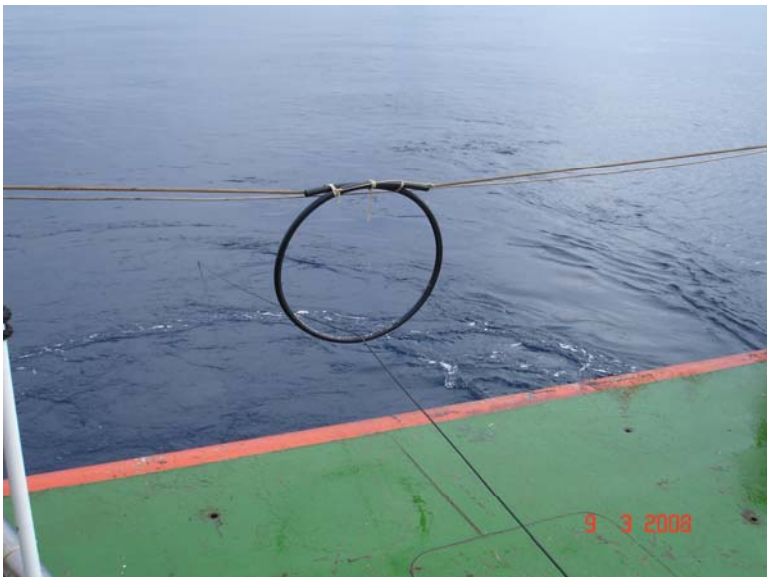


Fig 1. Plastic wheel replacing the pulley for deploying the SPMR.

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

May 15, 2008

Contents

Cruise Objectives

Routine operations

Multiple SPMR profiles are to occur within 1 hour of satellite overhead passes of MERIS 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 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 and AC9, 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.

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.

For one day of each cruise, 250 ml of sea water will be sampled at 200, 150, 80, 70, 6, 50, 40, 30, 20, 10 and 5 meters depth. For each sample, 125 ml will be filtered through a 0.2 µm GF/F filter and both total and filtered water samples will be analysed with the UltraPath for CDOM absorption determination.

Additional operations

One of the three days, François Bourrin will be on board for deploying two PROVOR-BIO buoys. One of the three days a PVM 0-1000 m profile and two Plankton Net 0-100 m profiles will be collected at the BOUSSOLE site.

Cruise Summary

During the three days of cruise the weather was generally good, though some clouds prevented optimal AOPs measurements on the first and last days. The first day was used for sampling at the BOUSSOLE site and along the transect from BOUSSOLE to the Nice port. On the same day, two PROVOR-BIO buoys were deployed too. The second day and third day were used for sampling at the BOUSSOLE site.

Wednesday 30 April 2008

This day the sea state was calm (H1/3 < 0.5 m) with low wind; the sky was partially covered. 1 CTD cast, 3 SPMR profiles and 1 Secchi Disk were performed at the BOUSSOLE site; CDOM and TSM samples were collected. Lighting conditions were not stable during SPMR cast. Two PROVOR-BIO buoys were deployed at the BOUSSOLE site before completing the transect on the route to the port of Nice.

Thursday 1 May 2008

For the International Workers' Day the sea state was again calm (H1/3 < 0.4 m) with low wind and blue sky. 2 CTD cast, 3 SPMR profiles and 7 CIMEL were performed at the BOUSSOLE site; TSM at surface were sampled. A PVM 0-1000 m profile and 2 x 0-100 m plankton net profiles were collected too.

Friday 2 May 2008

This day the sea state was very good (H1/3 < 0.2 m) with low wind and sky covered by cirrus. 1 CTD cast, 3 SPMR profiles and 1 Secchi Disk were performed at the BOUSSOLE site; TSM at surface were sampled too. Also this day lighting conditions were not stable during SPMR cast.

Cruise Report

Wednesday 30 April 2008 (UTC)

0415 Departure from the Nice port.
0740 Arrival at the BOUSSOLE site.
0750 CTD 01, 400 m, with water sampling at 200, 150, 80, 70, 60, 50, 30, 20, 10 and 5 m for HPLC, Ap, CDOM and TSM.
0850 SPMR 01, 02 and 03.
0940 Secchi Disk 01 (8 m).
1050 Deployement of 2 PROVOR-BIO buoys.
1100 CTD 02, 400 m, station 01 (43°25'N 07°48'E).
1150 CTD 03, 400 m, station 02 (43°28'N 07°42'E).
1245 CTD 04, 400 m, station 03 (43°31'N 07°37'E).
1345 CTD 05, 400 m, station 04 (43°34'N 07°31'E).
1445 CTD 06, 400 m, station 05 (43°37'N 07°25'E).
1535 CTD 07, 400 m, station 06 (43°39'N 07°21'E).
1630 Arrival at the Nice port.

Thursday 1 May 2008

0515 Departure from the Nice port.
0825 Arrival at the BOUSSOLE site.
0830 PVM 1000m. CIMEL 01, 02 and 03.
0910 CTD 08, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 30, 20, 10 and 5 m for HPLC, Ap.
0945 2 x Plankton Net 0-100 m.
1100 SPMR 04, 05 and 06.
1200 CTD 09 400 m with water sampling at 200, 150, 80, 70, 60, 50, 30, 20, 10 and 5 m for HPLC, and Ap, and TSM. CIMEL 04, 05, 06 and 07.
1230 Departure to the Nice port
1535 Arrival at the Nice port

Friday 2 April 2008

0500 Departure delayed for the arrival of a ferry into the Nice port.
0530 Departure from the Nice port.
0840 Arrival at the BOUSSOLE site.
0845 CTD 10, 400 m, with water sampling at 200, 150, 80, 70, 60, 50, 30, 20, 10 and 5 m for HPLC, Ap, and TSM.
0930 Secchi Disk 02 (9 m).
1100 SPMR 07, 08 and 09.
1200 Departure to the Nice port
1515 Arrival at the Nice port

Calculated Swath paths for the MERIS Sensor (ESOV Software)

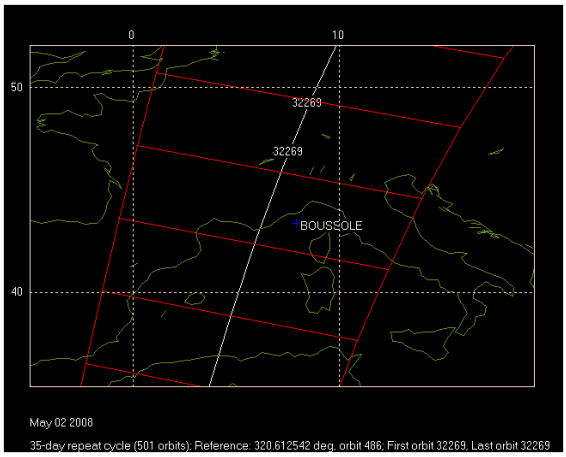


Figure 2. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for May 02 2008.

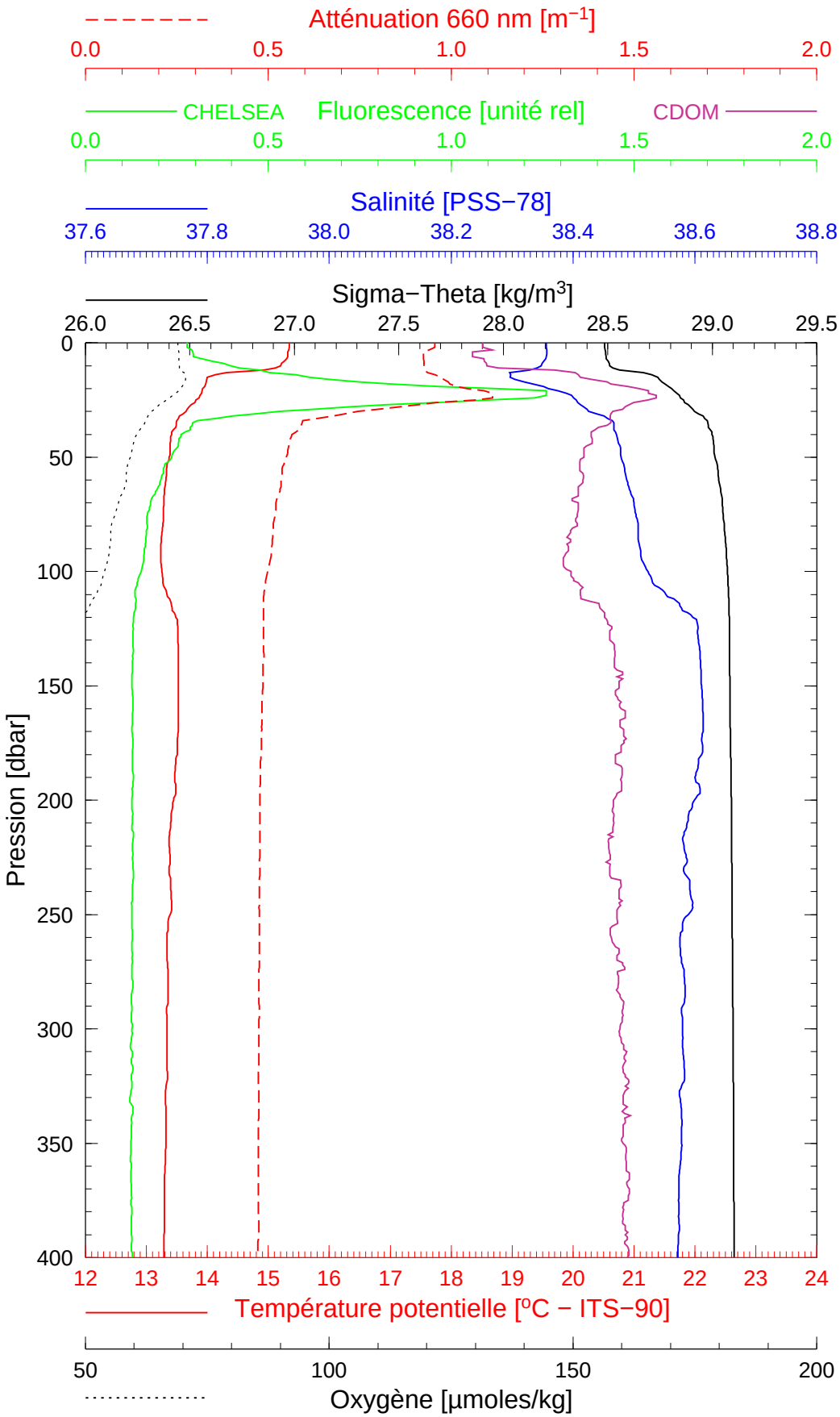
Appendix

Cruise Summary Table for Boussole 75

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	wat. samp. CDOM & TSM	07:50	28:00	400	43	22.218	7	53.829			7							15.35	slightly moved			
	Bou300408black1				08:53	3:00																			
		Bou300408AB			09:03	3:00	120	43	22.844	7	54.085	semi-covered	Cu	6					good			slightly moved	0.5		no
		Bou300408AD			09:12	3:00	120	43	22.943	7	54.112	semi-covered	Cu	6					good			slightly moved	0.5		no
		Bou300408AG			09:21		200	43	23.074	7	54.237	semi-covered	Cu	6					good			slightly moved	0.5		no
	Bou300408black2				09:49	3:00																			
30/04/08				Secchi Disk 01	09:40	2:00	8	43	23.333	7	54.403			6					good						no
			CTDBOUS002		10:58	23:00	400	43	25.047	7	47.912			7							15.5	slightly moved			
			CTDBOUS003		11:53	22:00	400	43	27.946	7	42.052			7							15.9	slightly moved			
			CTDBOUS004		12:47	25:00	400	43	30.958	7	36.875			8							15.2	slightly moved			
			CTDBOUS005		13:47	22:00	400	43	34.036	7	31.262			8							15.2	slightly moved			
			CTDBOUS006		14:46	22:00	400	43	37.018	7	25.085			7							15.4	slightly moved			
			CTDBOUS007		15:35	19:00	400	43	38.986	7	20.996			7							15.4	slightly moved			
				CIMEL01	08:33	4:00		43	22	7	54														
				CIMEL02	08:38	3:00		43	22	7	54														
				CIMEL03	08:41	4:00		43	22	7	54														
			CTDBOUS008		09:17	27:00	400	43	22.640	7	54.795														
	Bou010508black1				11:03	3:00																			
		Bou010508AA			11:23	4:43	200	43	23.068	7	55.295			0					excellent			slightly moved	0.4		no
01/05/08		Bou010508AB			11:34	4:21	200	43	23.106	7	55.293			0					excellent			slightly moved	0.4		no
		Bou010508AC			11:45	4:47	200	43	23.205	7	55.245			0					excellent			slightly moved	0.4		no
	Bou010508black1				11:59	3:00																			
			CTDBOUS009	wat. samp.TSM	12:04	24:00	400	43	23.231	7	55.266			0							15.9	slightly moved			
				CIMEL04	12:04	3:00		43	22	7	54														
				CIMEL05	12:08	4:00		43	22	7	54														
				CIMEL06	12:12	6:00		43	22	7	54														
				CIMEL07	12:24	6:00		43	22	7	54														
			CTDBOUS010	wat. samp.TSM	08:54	27:00	400	43	22.378	7	53.543			3							15.7	slightly moved			
				Secchi Disk 02	09:30	2:00	9	43	22	7	54														
	Bou020508black1				10:55	3:00																			
02/05/08		Bou020508AA			11:09	5:13	185	43	22.568	7	53.453		Ci	7					good			calm	0.2		no
		Bou020508AB			11:23	6:09	280	43	22.650	7	53.367		Ci	7					good			calm	0.2		no
		Bou020508AD			11:37	4:34	200	43	22.733	7	53.213		Ci	7					good			calm	0.2		no
	Bou020508black1				11:53	3:00																			

Boussole **30/04/2008** **BOUS080430_01**

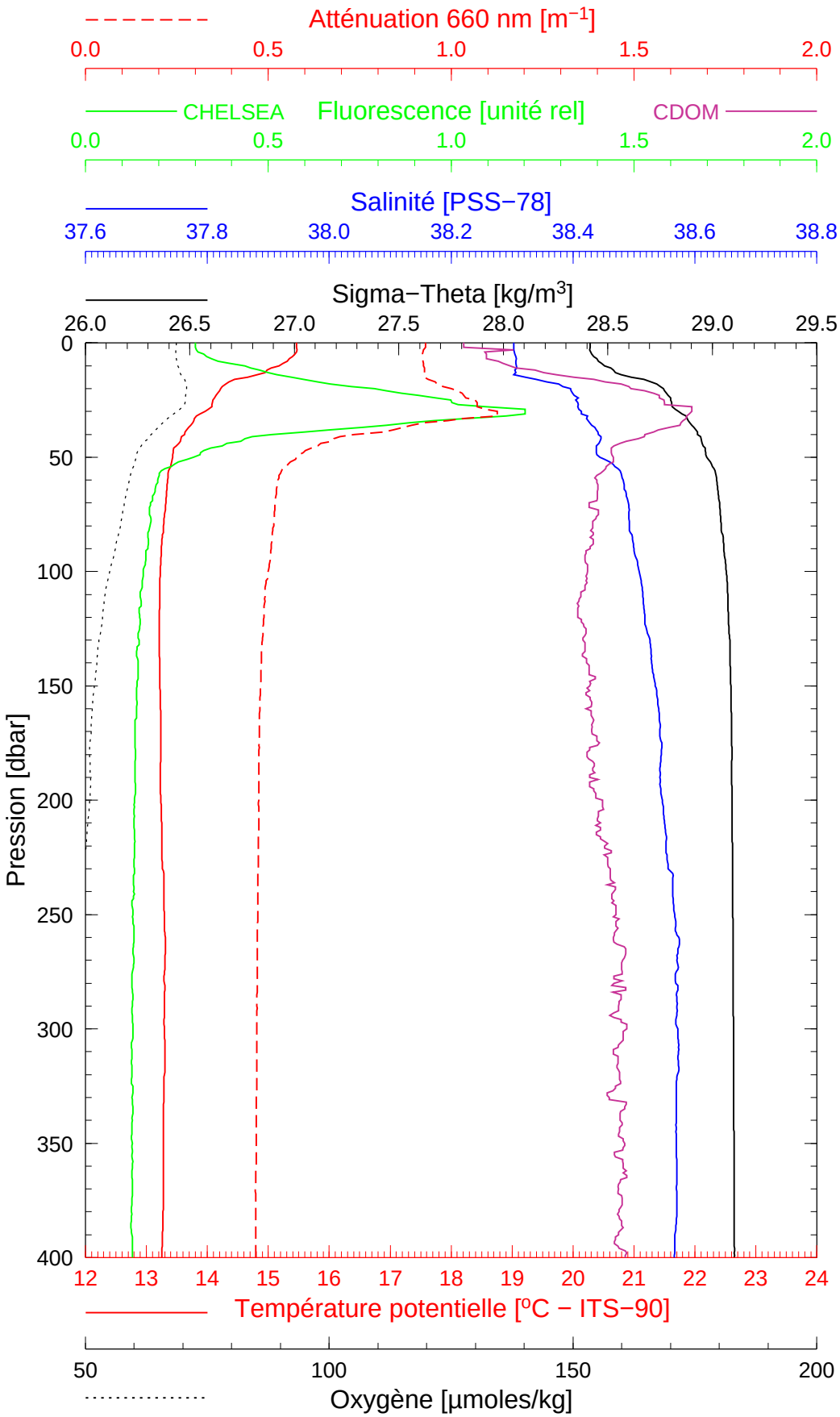
BOUS001



Date	*30/04/2008*	*Latitude*	*43°22.218*
Heure déb	*07h 50min [TU]*	*Longitude*	*07°53.829*

Boussole **30/04/2008** **BOUS080430_02**

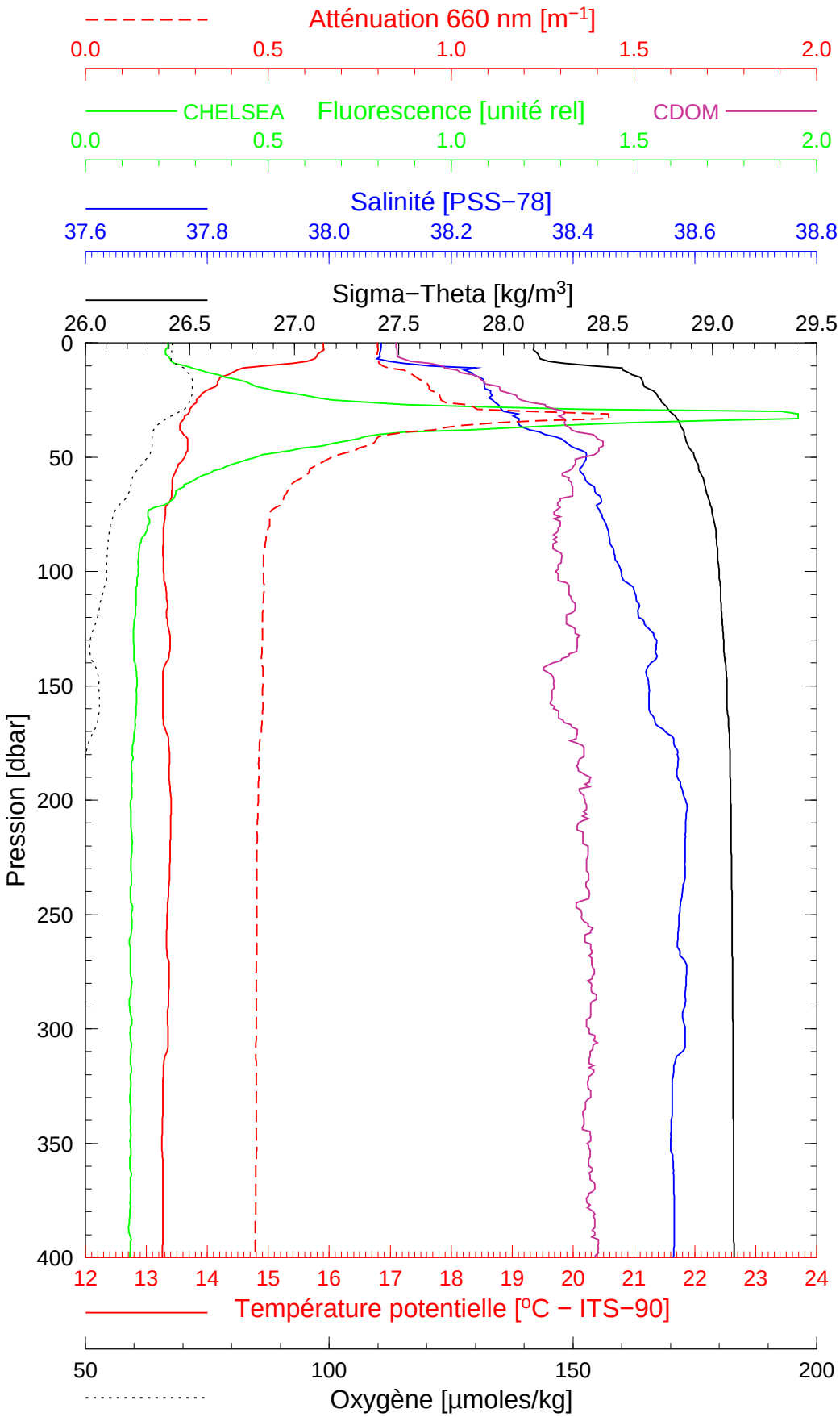
BOUS002



Date	*30/04/2008*	*Latitude*	*43°25.047*
Heure déb	*10h 58min [TU]*	*Longitude*	*07°47.912*

Boussole **30/04/2008** **BOUS080430_03**

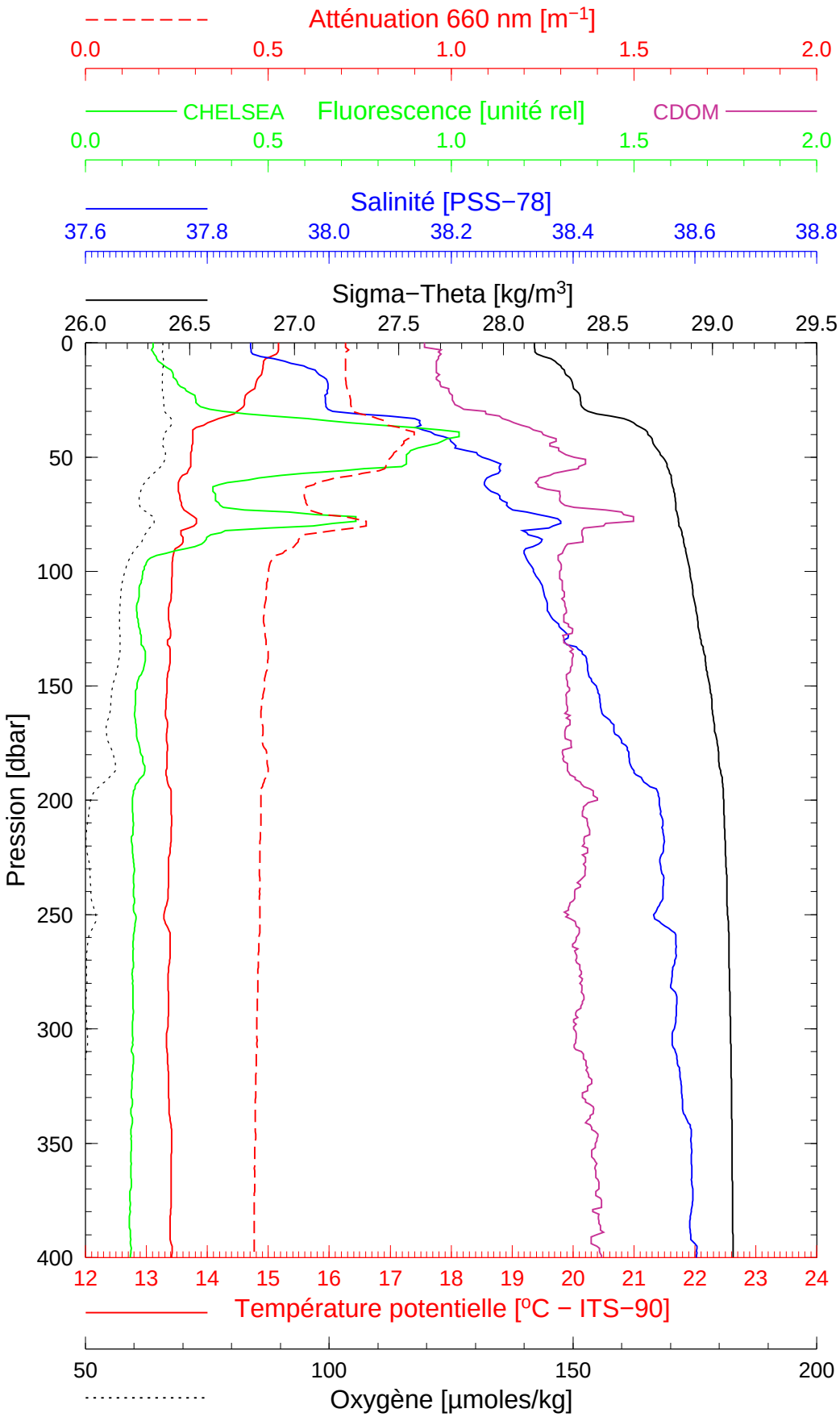
BOUS003



Date	*30/04/2008*	*Latitude*	*43°27.946*
Heure déb	*11h 53min [TU]*	*Longitude*	*07°42.052*

Boussole **30/04/2008** **BOUS080430_04**

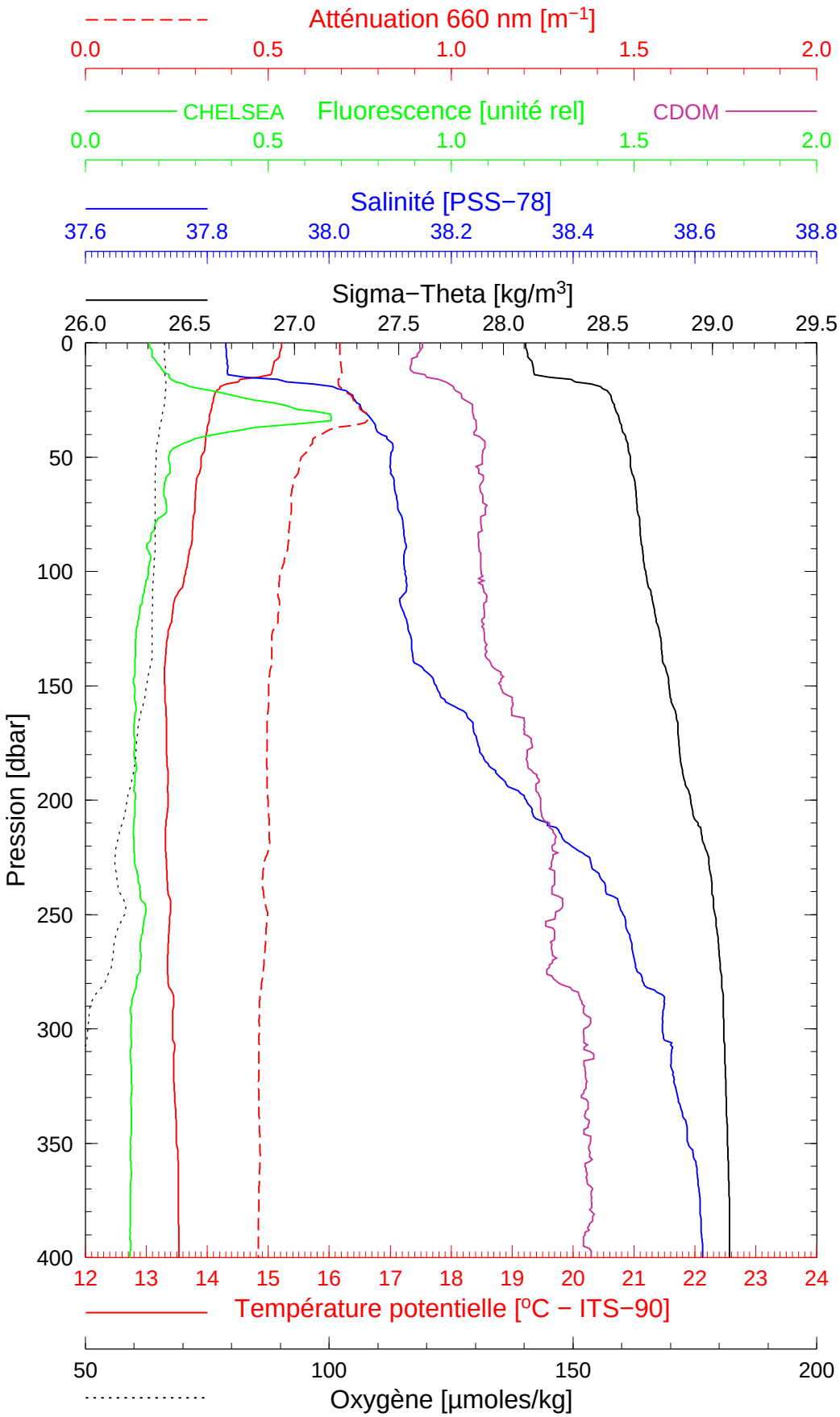
BOUS004



Date	*30/04/2008*	*Latitude*	*43°30.958*
Heure déb	*12h 47min [TU]*	*Longitude*	*07°36.875*

Boussole **30/04/2008** **BOUS080430_05**

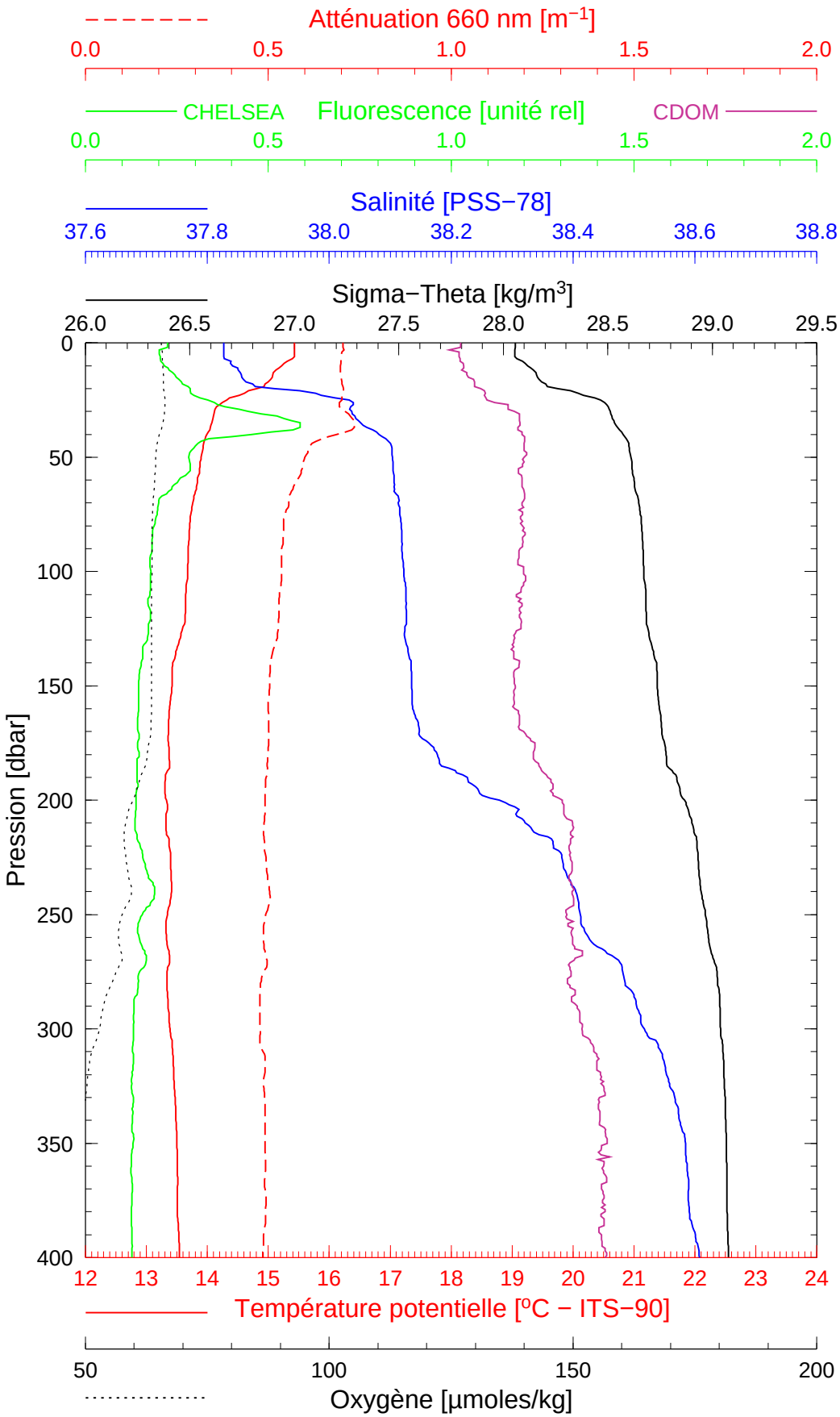
BOUS005



Date	*30/04/2008*	*Latitude*	*43°34.036*
Heure déb	*13h 47min [TU]*	*Longitude*	*07°31.262*

Boussole **30/04/2008** **BOUS080430_06**

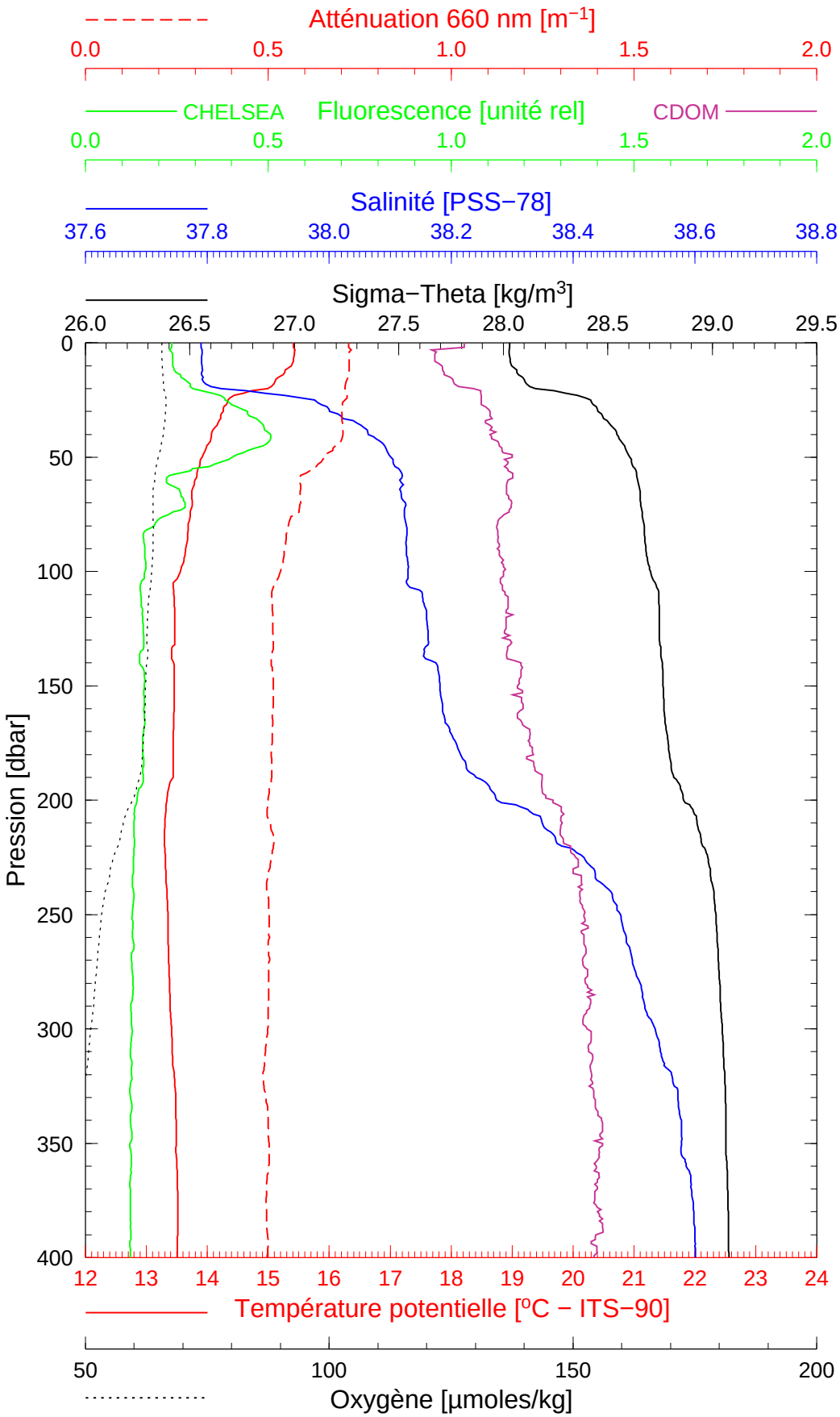
BOUS006



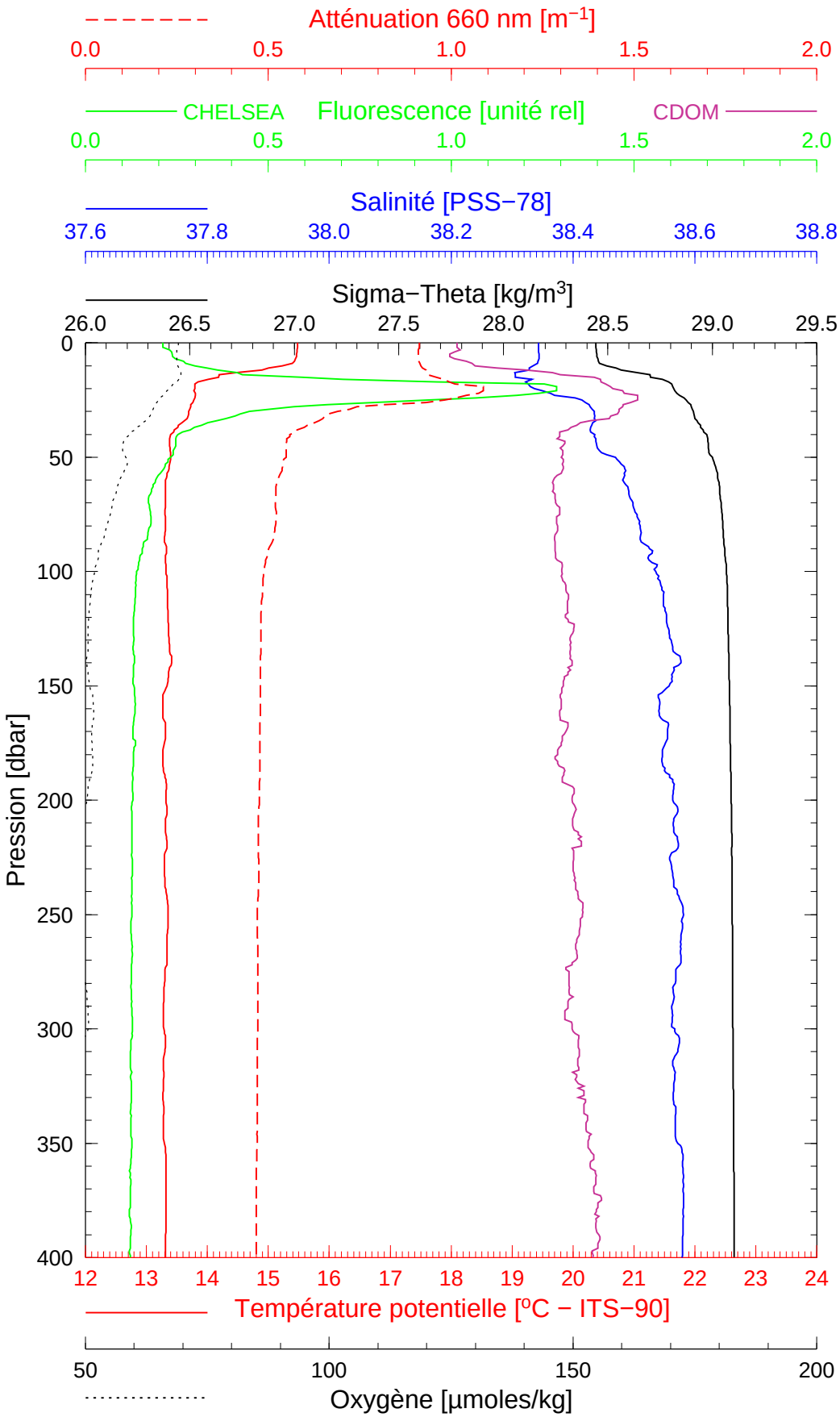
Date	*30/04/2008*	*Latitude*	*43°37.018*
Heure déb	*14h 46min [TU]*	*Longitude*	*07°25.085*

Boussole **30/04/2008** **BOUS080430_07**

BOUS007

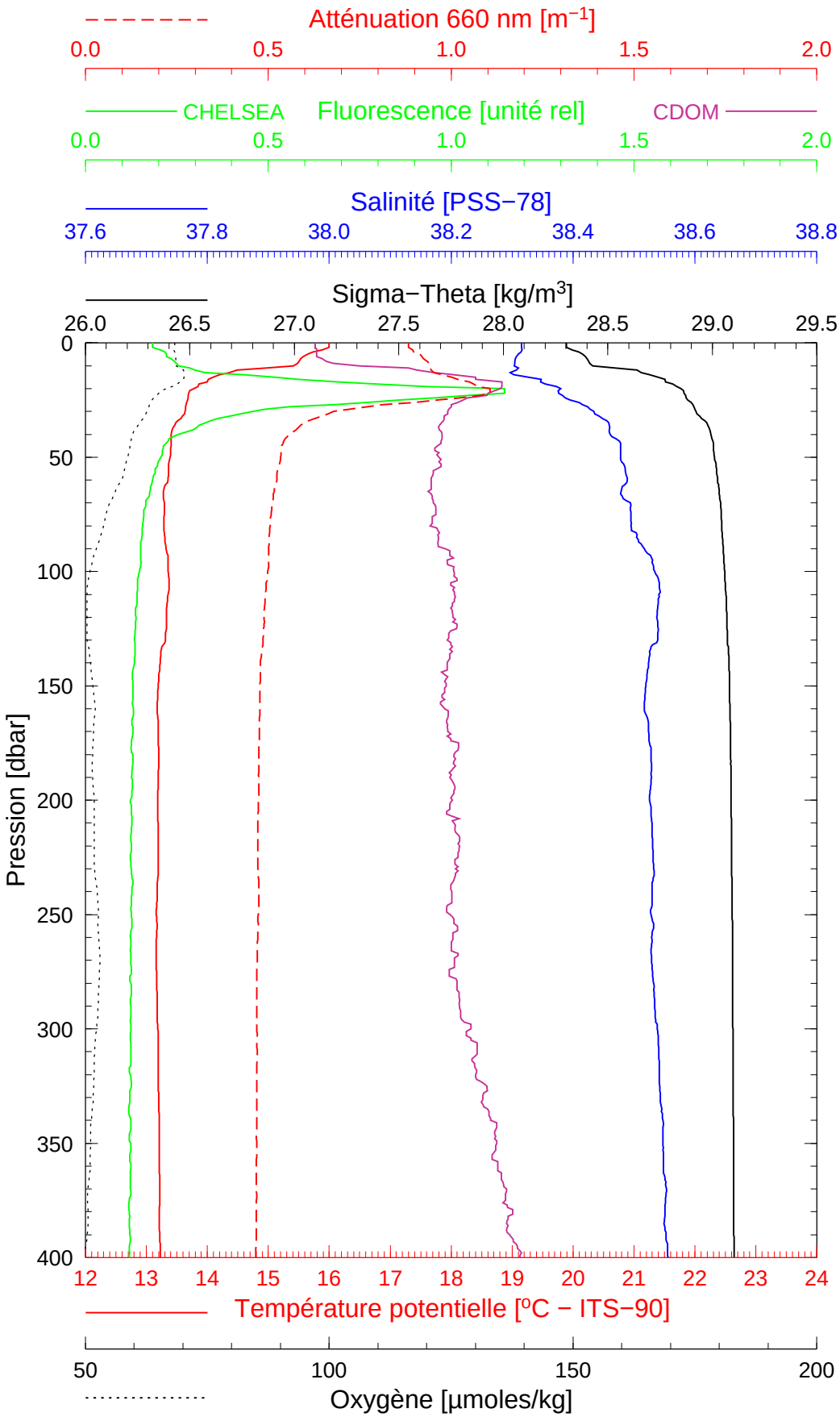


Date	*30/04/2008*	*Latitude*	*43°38.986*
Heure déb	*15h 35min [TU]*	*Longitude*	*07°20.996*


Atténuation 660 nm [m−1]
0.0
0.5
1.0
1.5
2.0
CHELSEA
Fluorescence [unité rel]
CDOM
0.0
0.5
1.0
1.5
2.0
Salinité [PSS−78]
37.6
37.8
38.0
38.2
38.4
38.6
38.8
Sigma−Theta [kg/m3]
26.0
26.5
27.0
27.5
28.0
28.5
29.0
29.5
Pression [dbar]
0
50
100
150
200
250
300
350
400
12
13
14
15
16
17
18
19
20
21
22
23
24
Température potentielle [°C − ITS−90]
50
100
150
200
Oxygène [µmoles/kg]

Boussole **01/05/2008** **BOUS080501_09**

BOUS009



Date	*01/05/2008*	*Latitude*	*43°23.231*
Heure déb	*12h 04min [TU]*	*Longitude*	*07°55.266*