BOUSSOLE Monthly Cruise Report

Cruise 23
June 27 – 29, 2003

Duty Chief: Alec Scott (alec.scott@obs-vlfr.fr)
Vessel: R/V Téthys II
(Captain: Alain Stépahn)

Science Personnel: Alec Scott, Dominique Tailliez, Guillaume Lecomte

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Fig 1. Hauling in the SPMR on the capstan.

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

December 2, 2005

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 of the USA

Centre National de la Recherche Scientifique, France

Institut National des Sciences de l'Univers, France

Université Pierre & Marie Curie, France

Observatoire Océanologique de Villefranche sur mer, France

Cruise Objectives:

Multiple SPMR profiles are to occur within 1 hour of satellite overhead passes of SeaWiFS and MERIS and around solar noon. Optimal conditions: Clear blue skies and flat, calm sea surface. SIMBADA measurements are to be performed consecutively where possible with SPMR if conditions are suitably good. If sea conditions are poor but sky is good, SIMBADA data will be collected and used only to measure atmospheric optical thickness. A floating platform is to be used to support the SPMR Eu sensor approximately 20cm below the surface for several minutes 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. This data will later be compared with the near-surface extrapolation methods used in processing. CTD deployments are required before and after the SPMR profiling day. In addition to the depth profile from the CTD, CDOM fluorometer, Chl fluorometer and AC9, seawater samples are to be collected, filtered and the filters stored in LN2 for further HPLC pigment and particulate absorption filter analysis 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.

An additional feature intended to be continued for all Boussole cruises is a ctd transect between the boussole site and the Port of Nice. This transect consists of four fixed locations on route from Boussole and with the last two station positions to be decided on each cruise in order to sample on each side of the main ocean front. The time of day of this transect should be similar for each cruise, if possible. Also on this transect line, Simbada measurements of optical thickness should be taken to characterise variability between the Cap Ferrat sun photometer and the Boussole site.

Student Guillaume Lecomte will participate in the cruise in order to carry out two profiles to 1000m with a bathyphotometer, for the measurement of bioluminescence.

Cruise Summary:

Departure was at 0630 in adjusting to the earlier high sun angles but no earlier to avoid problems with ship crew work hours. On arrival at site the conditions were a little choppy to the extent that the SPMR surface buoy could not be deployed but were certainly acceptable for the normal and CTD. However, throughout the morning sea conditions improved although cloud cover seemed to be very variable and quick-changing; switching rapidly between cloudy and clear. By late morning, the conditions were fairly good for optics but prone to rapid changes in cloud cover still. The schedule was maintained fairly well throughout the day. When it was discovered that there was a problem with diesel leaking into the oil of the ship engine, the plan for the day was continued with the exception that we would be stopping in Nice overnight, rather than returning straight to Boussole after the transect. Stations 3 and 6 were missed from the transect too in order to get the ship into port a little sooner.

The ship engines were repaired Saturday morning allowing us to return to site with very good conditions and just enough sun angle for a SPMR session and ctd cast. This fitted in with the end of the optics session on the schedule, as if we been at sea all day.

The final day yielded super conditions for optics and a good possibility for Meris and SeaWiFS matchups. The skies were very clear and seas glassy towards the afternoon. Simbada measurements were taken from the normal upper deck and for some measurements, also from the top of the bridge with the sun slightly to the starboard bow. During high sun angle sessions, SPMR profiles were taken to 200m rather than 120m as typical of recent cruises. The conditions should provide some good data for the SPMR surface buoy surface extrapolation model comparisons.

Cruise Report (all times in GMT)

Friday 27th June 2003

0630 Depart Port of Nice.

0915 Arrival at Boussole Site (43°22'N 7°54'E).

1012 CTD Boussole 1. Max 400m. Bottle depths (m): 200,150,100,80,60,50,25,20,10, 5.

1045 CTD on deck.

1057 SPMR deployed

1113 SPMR on deck (4 profiles)

1114 SPMR surface float deployed

1139 SPMR surface float recovered (2 profiles)

1213 SPMR deployed

1242 SPMR on deck (4 profiles)

1407 SPMR deployed

1425 SPMR on deck (3 profiles)

1502 CTD Boussole 2. Max 400m. Bottle depths (m): 10, 5.

1530 CTD on deck

1612 CTD Boussole 3 Transect Station 1

1712 CTD Boussole 4 Transect Station 2

1848 CTD Boussole 5 Transect Station 4

1947 CTD Boussole 6 Transect Station 5

2030 Arrive Nice

Saturday 28th June, 2003

1230 Depart Nice

1230-1600 Simbada solar measurements every 30 minutes

1600 Arrive Boussole

1608 SPMR deployed.

1625 SPMR on deck (2 profiles).

1730 CTD Boussole 7. Max 400m. Bottle Depths (m) 10, 5.

1754 CTD on deck.

1755 Commence quadrilateral

1850 Quadrilateral completed

1855 Bathyphotometer profile

2000 Remain in vicinity of Boussole

Sunday 29th June, 2003

0530 Bathyphotometer profile

0635 CTD Boussole 8. Max 400m. Bottle Depths (m) 400,150,120,100,80,70,60,40,20,10, 5.

0703 CTD on deck

0726 SPMR in water

0745 SPMR on deck (3 profiles)

0906 SPMR in water

0925 SPMR on deck (2 profiles + Meris 0926)

1105 SPMR in water

1123 SPMR on deck (2 profiles + SeaWiFS 1059)

1238 SPMR surface float in water

1305 SPMR surface float on deck (2 profiles +SeaWiFS 1237)

1453 CTD Boussole 9. Boussole Site. Max 100m. Bottle Depths (m) 10, 5

1518 CTD on deck

1523 SPMR in water

1538 SPMR on deck (2 profiles)

1540 Depart Boussole Site for Port of Nice

1540-1700 Simbada measurements every 30 minutes

1900 Arrive Port of Nice

Satellite Overhead Passes at Boussole Site (43°22'N 7°54'E)

SeaWiFS (times in GMT)

- 27 Jun 2003 11:15 at 23.41 degrees elevation
- 27 Jun 2003 12:53 at 34.87 degrees elevation
- 28 Jun 2003 11:56 at 55.36 degrees elevation
- 28 Jun 2003 13:33 at 15.70 degrees elevation
- 29 Jun 2003 10:59 at 16.30 degrees elevation
- 29 Jun 2003 12:37 at 48.89 degrees elevation

Meris (times in GMT)

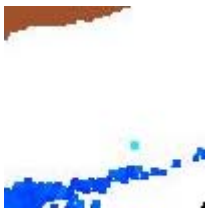
- 29 June 2003 09:26

Ligurian Sea Boussole Site Images

http://seawifs.gsfc.nasa.gov/cgi/seawifs_region_extracts.pl

SeaWiFS



Modis

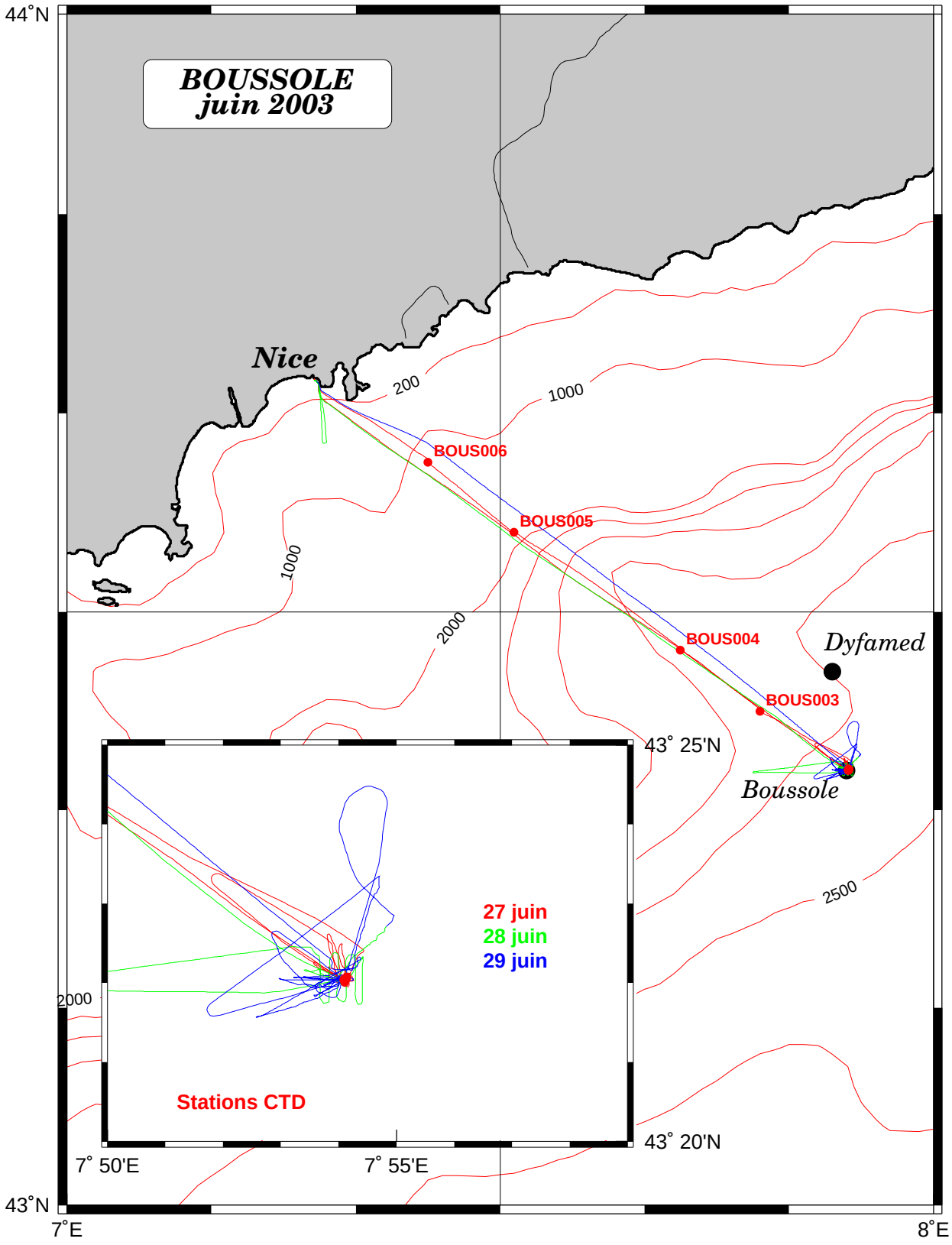




27th June, 2003 27th June, 2003 27th June, 2003

Tabulated Cruise Summary for Boussole 23

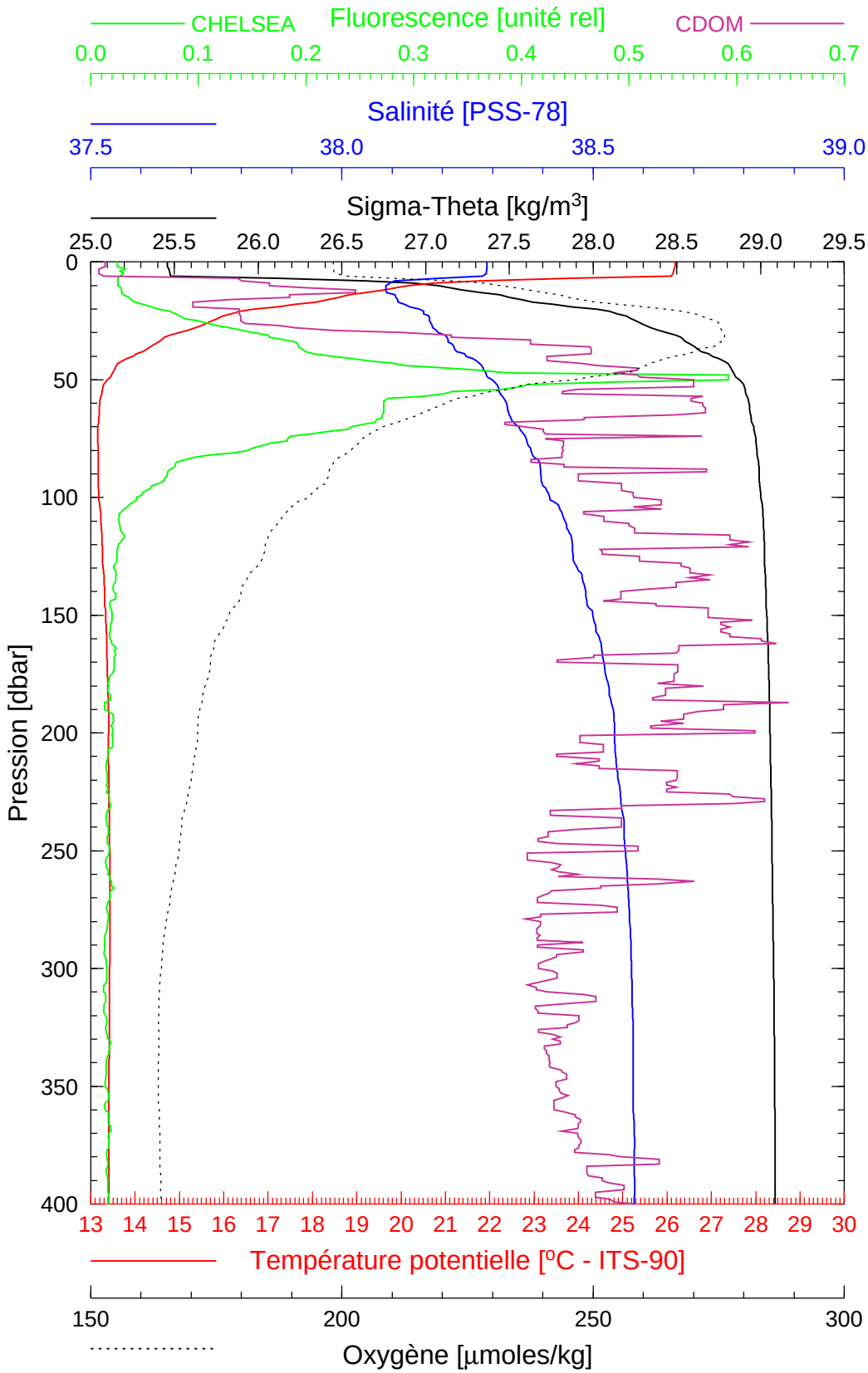
Date	Sensors:	Black names	Profile names	CTD notées /	Start Time	Duration	Depth max	Latitude (N)		50		Other sensors	cast	PAR	Start/Finish				Weather							Sea		
	spmr&smsr, smsr	(file extension: *.raw*)	(file extension: *.raw*)	satellite overpass	GMT (hour.min)	(min.sec)	(meter)	(Degree)	(Minute)	(Degree)	(Minute)				S/F mark#	Sky	Clouds	Qty (#/8)	Wind speed	Wind dir.	Atm. Press	humidity	Visibility	T air	T water	Sea	Swell height	Swell dir.	White horses
27/06/03				CTDBOUS001	10.12	33:00	400	43	22.009	7	54.103							1	3	211	1010.8	85		26	26.2	good			
	spmr&smsr	bou270603black1			8.50	03:00																						
			bou270603a		8.59	04:17	200	43	22.047	7	54.112	Simbada	08:53			milky	light cirrus	1	0	-	1010.9	79	good	27.2		quite calm	0		0
			bou270603b		9.11	04:01	200	43	22.018	7	54.222	Simbada	09:03			milky	light cirrus	1	0	-	1010.9	79	good	27.2		quite calm	0		0
			bou270603c		11.02	01:46	80	43	22.135	7	53.811	Simbada	10:57	par20030627a	1,2		cumulus	7	0	-	1011	79	good	27.2		quite calm	0		0
			bou270603d		11.08		120	43	22.125	7	53.811			par20030627a	3,4		extensive cumulus	7	0	-	1010.9	79	good	27.2		quite calm	0		0
			bou270603spmratsurface1	SeaWiFS 1115	11.14		120	43	22.028	7	53.929	Simbada	11:14	par20030627a	5,6		extensive cumulus	7	0	-	1010.9	79	good	27.2		quite calm	0		0
			bou270603spmratsurface2		11.29		120	43	22.028	7	53.929	Simbada	11:28	par20030627a			extensive cumulus	7	0	-	1010.4	79	good	27.2		quite calm	0		0
			bou270603e		12.14	04:18	200	43	22.182	7	54.099	Simbada	12:10	par20030627b	1,2	very milky	cumulus	2	5knts	177	1010.4	74	good	27.8		calm	0.5		0
			bou270603f		12.27		200	43	22.322	7	54.017			par20030627b	3,4	very milky	cumulus	2	5knts	177	1010.4	74	good	27.8		calm	0.5		0
			bou270603g	SeaWiFS 1253	12.37		200	43	22.464	7	53.939	Simbada	12:37	par20030627b		very milky	cumulus	2	5knts	177	1010.4	74	good	27.8		calm	0.5		0
		bou270603black2			14.58	03:00																						
		bou270603black3			14.00	03:00																						
			bou270603h		14.08		200	43	22.104	7	53.967	Simbada	14:07			milky	cirrus and cumulus	4	0	-	1009.9					calm	0		0
			bou270603i		14.18	04:04	200	43	22.284	7	53.921	Simbada	14:18			milky	cirrus and cumulus	4	0	-	1009.9					calm	0		0
		bou270603black4			14.48	03:00																						
				CTDBOUS002	15.02	28:00	400	43	22.055	7	54.142							5	6knts	192	1009.9	84		26	27	good			
	spmr&smsr			CTDBOUS003	16.12	24:00	400	43	22.993	7	47.983							8	5knts	187	1009.9	84		26.2	26.3	good			
				CTDBOUS004	17.12	27:00	400	43	28.073	7	42.462							8	4knts	177	1010.2	86		26.3	26.7	good			
				CTDBOUS005	18.48	20:00	400	43	34.019	7	30.968							8	3knts	272	1010.2	85		26.2	25.8	v calm			
				CTDBOUS006	19.47	00:22	400	43	37.535	7	24.996							8	1knts	317	1010.6	87		25.9	26.3	v calm			
28/06/03												Simbada	13:21				Cumulus	3	6knts		1010.3								
												Simbada	14:02				Cumulus	3	4knts		1010.3								
												Simbada	14:29				Cumulus	3	3knts		1010.2								
												Simbada	14:59				Cumulus	3			1009.8								
												Simbada	15:43				Cumulus	3											
	spmr&smsr	bou280603black1			16.00	03:00																						
			bou280603a		16.09		150	43	22.086	7	53.807	Simbada	16:05	par20030628a	1(start)	milky	fine cirrus	1	0	-	1009.8	75	good	27.7		v calm	0	0	0
			bou280603b		16.18	06:00	150	43	22.115	7	53.712			par20030628a	2,3	milky	fine cirrus	1	0	-	1009.8	75	good	27.7		v calm	0	0	0
		bou280603black2			16.31	03:00																						
				CTDBOUS008	17.30	24:00	400	43	22.038	7	54.09							6	2knts	197	1009.8	78		26.8	26.9	v calm			
				Quadrilatere 001	18.15		5	43	22.319	7	54.401																		
				Quadrilatere 002	18.32		5	43	21.784	7	54.021																		
				Quadrilatere 003	18.45		5	43	22.335	7	53.668																		
29/06/03				CTDBOUS009	6.35	28:00	400	43	22.075	7	54.14							4	12knts	68	1009.7	77		25.4	26.5	a little rough			
	spmr&smsr	bou290603black1			7.22	03:00																						
			bou290603a		7.27	03:07	150	43	21.991	7	53.997			par20030629a	1,2	slightly milky	clear	0	13knts	79	1010.2	75	good	25.1		a little rough	0.5	90	some
			bou290603b		7.35		150	43	21.908	7	53.804			par20030629a	3,4	slightly milky	clear	0	13knts	79	1010.2	75	good	25.1		a little rough	0.5	90	some
	smsr only		bou290603c		7.48	03:00		43	21.806	7	53.608	Simbada	07:59	par20030629a	5(end)	slightly milky	clear	0	13knts	79	1010.2	75	good	25.1		a little rough	0.5	90	some
		bou290603black2			8.07	03:00																						
		bou290603black3			8.54	03:00																						
			bou290603d		9.07	04:00	200	43	22.25	7	54.333	Simbada	09:06	par20030629b		milky	clear	0	11knts	-	1010		good			choppy	0.5		few
			bou290603e	Meris 0926	9.20	04:12	200	43	22.178	7	54.191			par20030629b		milky	clear	0	11knts	-	1010		good			choppy	0.5		few
		bou290603black4			9.37	03:00						Simbada	09:36															
		bou290603black5			11.00	03:00																						
			bou290603f	SeaWiFS 1059	11.07		200	43	21.991	7	54.019	Simbada	11:04	par20030629c	1,2	milky blue	clear	0	5kts	104	1011	72	good	26.5		choppy, improving	0.4		no
			bou290603g		11.17		200	43	21.985	7	53.75			par20030629c	3,4	milky blue	clear	0	5kts	104	1011	72	good	26.5		choppy, improving	0.4		no
		bou290603black6			11.42	03:00																						
		bou290603black7			12.22	03:00																						
			bou290603spmratsurface1	SeaWiFS 1237	12.39	06:50	200	43	21.959	7	53.876	Simbada	12:35	par20030629d	1,2	blue	cirrus	1	3kts	106	1010.5	74	good	27.1		good	0.3		no
			bou290603spmratsurface2		12.56		200	43	21.956	7	53.627	Simbada	12:54	par20030629d	3,4	blue	cirrus	1	3kts	106	1010.5	74	good	27.1		good	0.3		no
		bou290603black8			13.43	03:00																						
				CTDBOUS010	14.53	25:00	400	43	22.06	7	54.114							2	3kts	270	1010.5	76		26.6	26.9	calm ideal			
			bou290603h		15.24	02:34	120	43	22.171	7	53.939	Simbada	15:19			milky	clear	0	3kts		1009.9	77	good	26.2		glassy	0		no
			bou290603i		15.32	02:20	120	43	22.206	7	53.877					milky	clear	0	3kts		1009.9	77	good	26.2		glassy	0		no
		bou290603black9			15.42	03:00																						
												Simbada	16:04				clear	0	1kts		1009.7								
												Simbada	16:42				clear	0	0kts		1009.6								
												Simbada	17:31				clear	0	4kts		1009.5								



GMT 2005 Apr 8 10:14:49

Boussole 23 **27/06/2003** **BOUS030627_01**

BOUS001

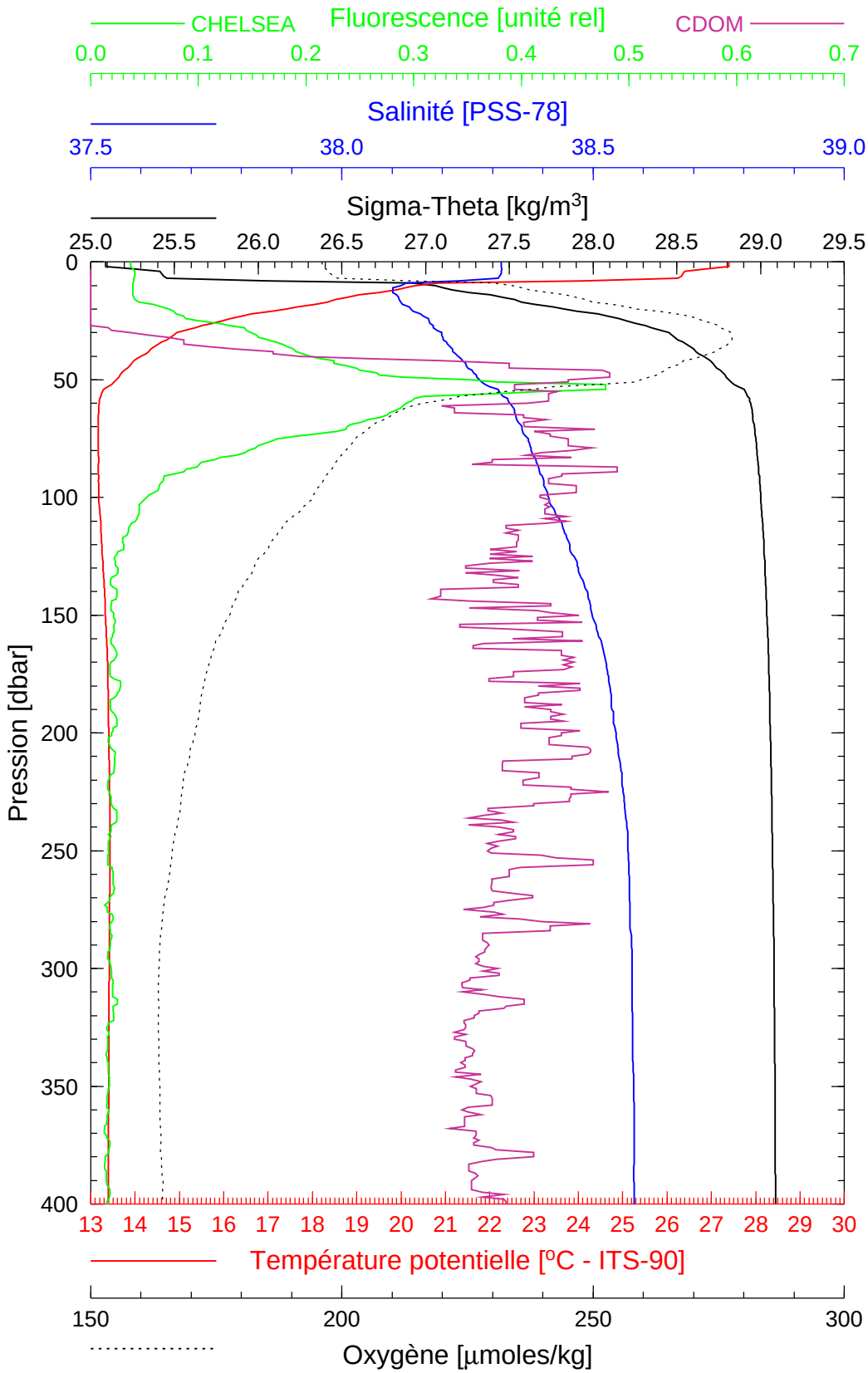


Date *27/06/2003* *Latitude* *43º22.009 N*

Heure déb *08h 12min [TU]* *Longitude* *07º54.103 E*

Boussole 23 **27/06/2003** **BOUS030627_02**

BOUS002

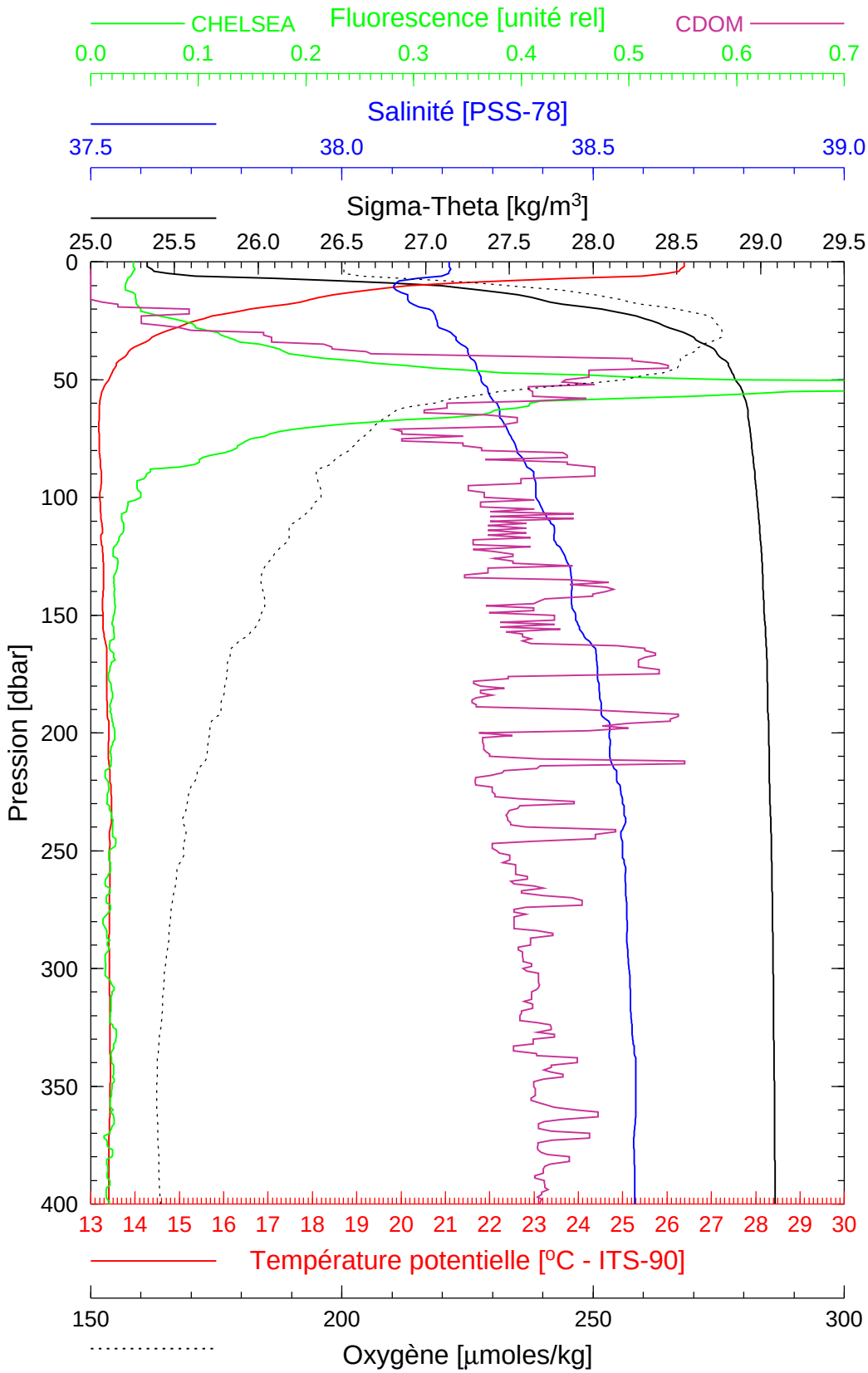


Date *27/06/2003* *Latitude* *43º22.055 N*

Heure déb *15h 02min [TU]* *Longitude* *07º54.142 E*

Boussole 23 **27/06/2003** **BOUS030627_03**

BOUS003

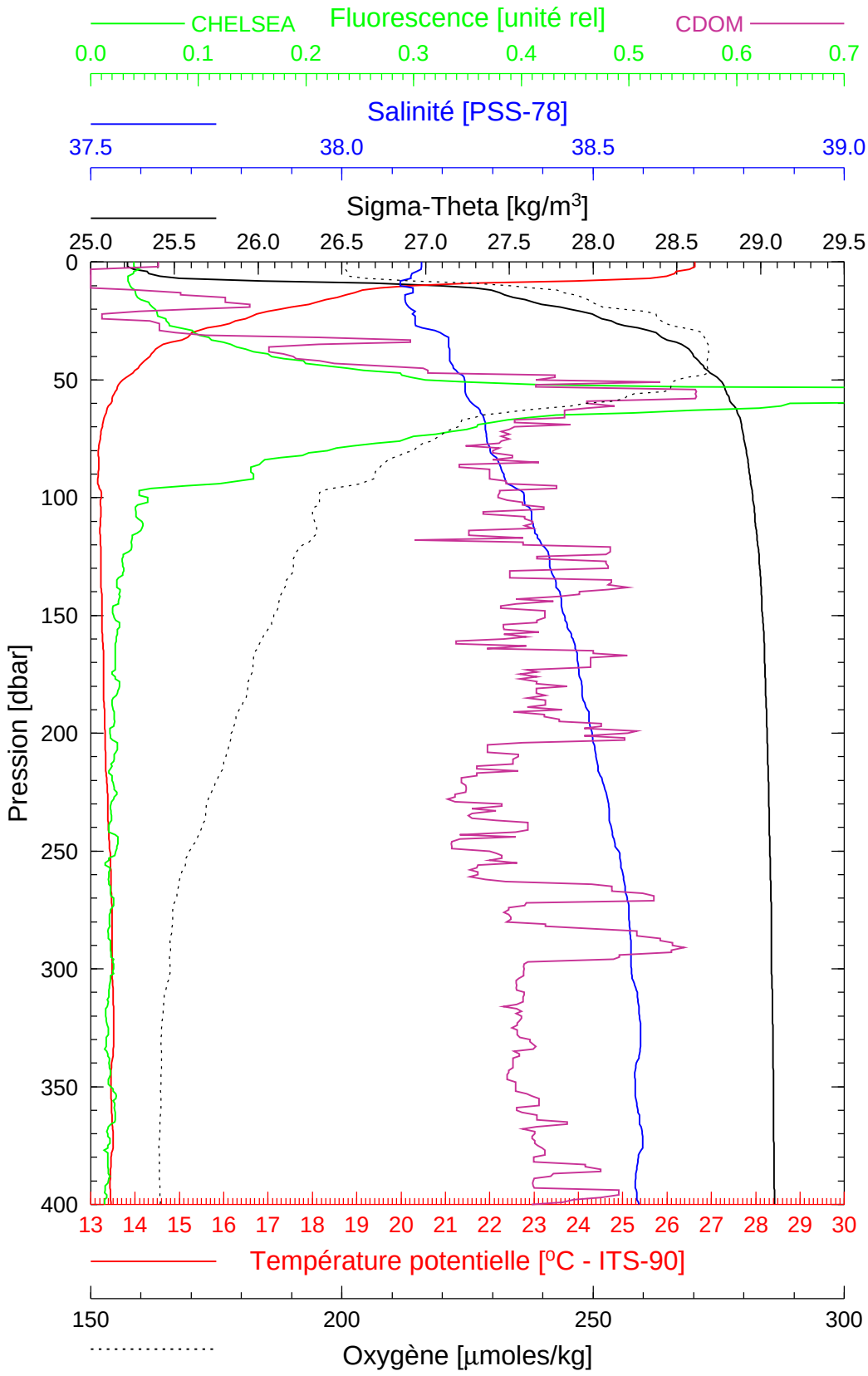


Date *27/06/2003* *Latitude* *43º24.993 N*

Heure déb *16h 12min [TU]* *Longitude* *07º47.984 E*

Boussole 23 **27/06/2003** **BOUS030627_04**

BOUS004

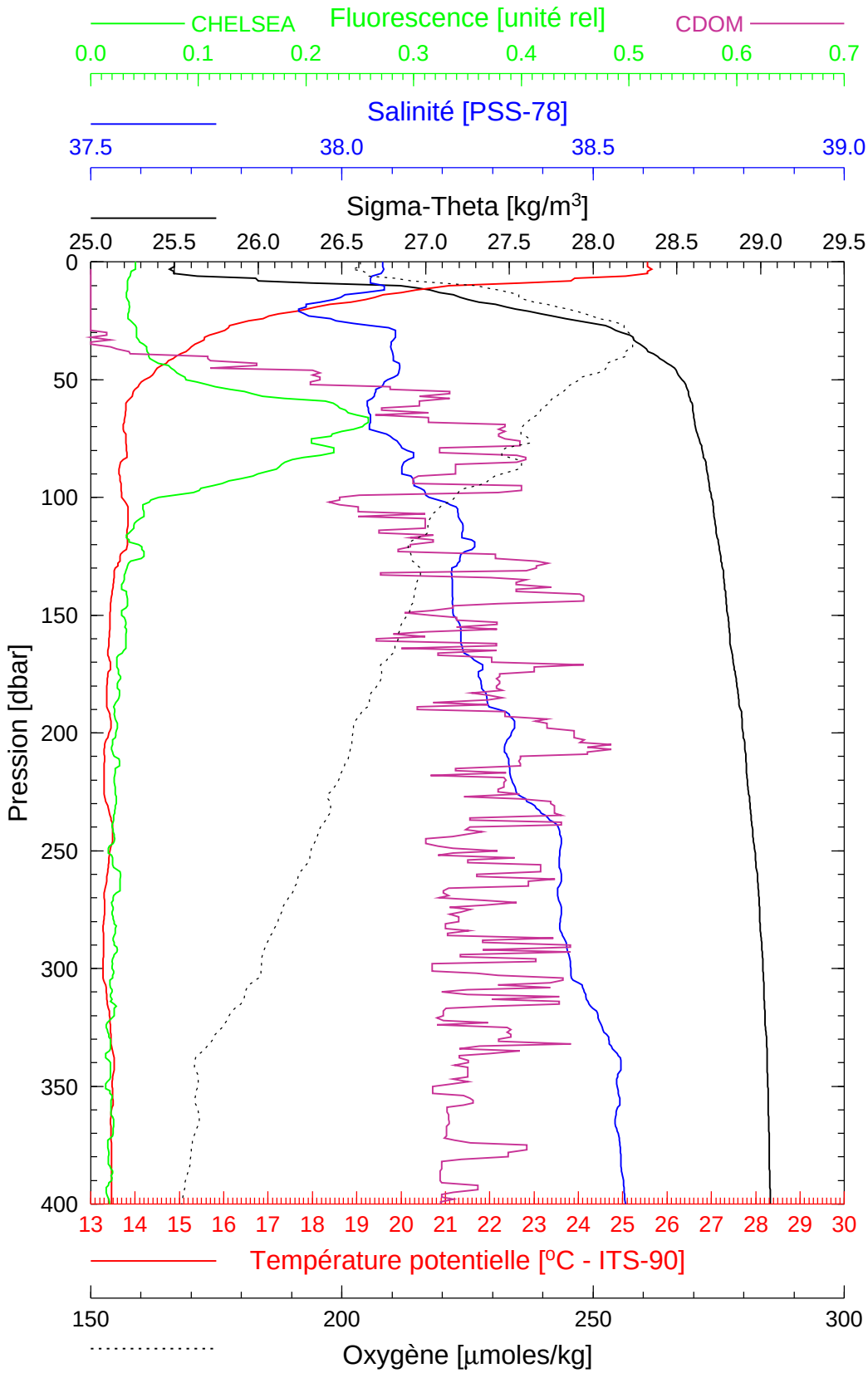


Date *27/06/2003* *Latitude* *43º28.073 N*

Heure déb *17h 12min [TU]* *Longitude* *07º42.462 E*

Boussole 23 **27/06/2003** **BOUS030627_05**

BOUS005

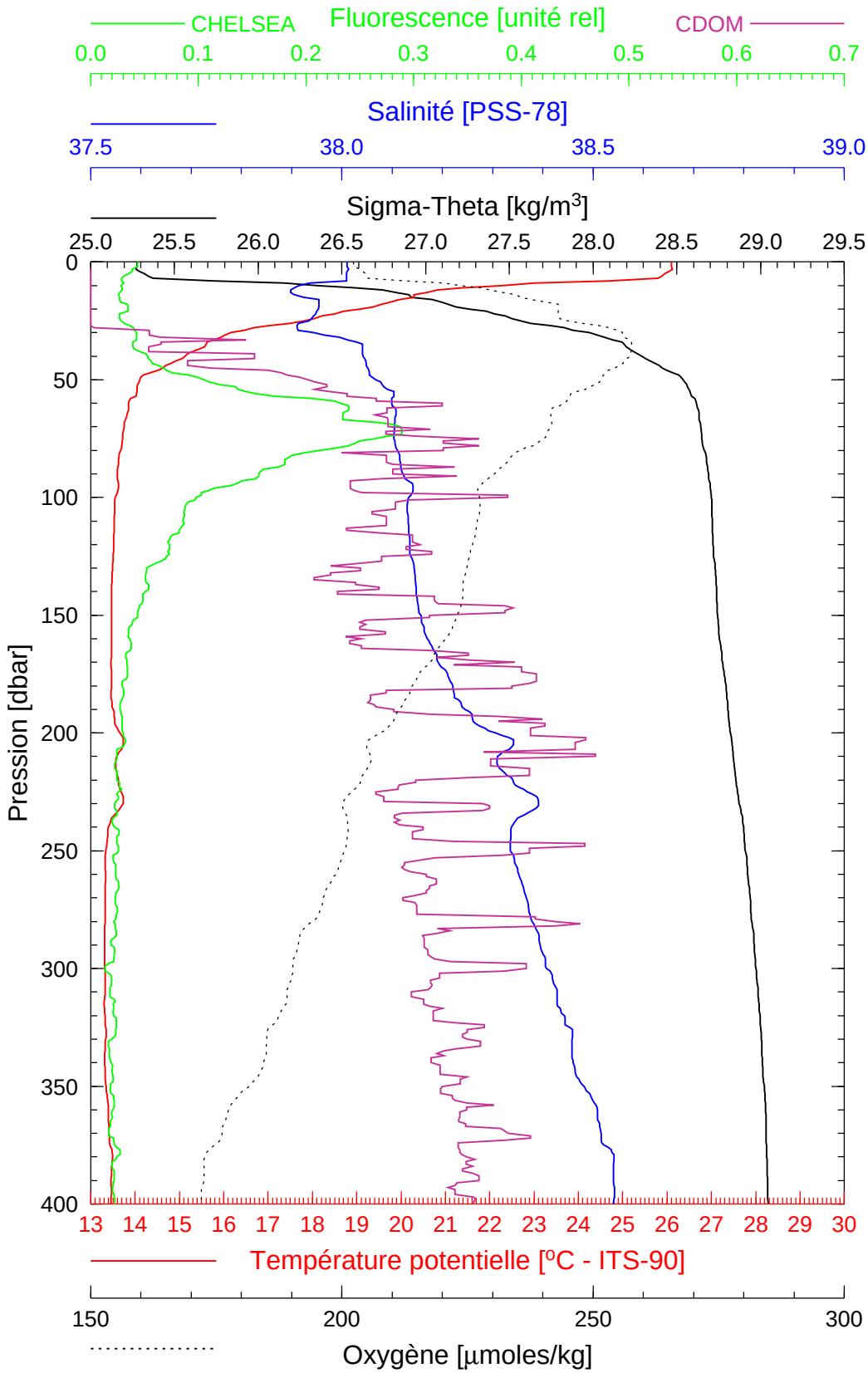


Date *27/06/2003* *Latitude* *43º34.019 N*

Heure déb *18h 48min [TU]* *Longitude* *07º30.968 E*

Boussole 23 **27/06/2003** **BOUS030627_06**

BOUS006

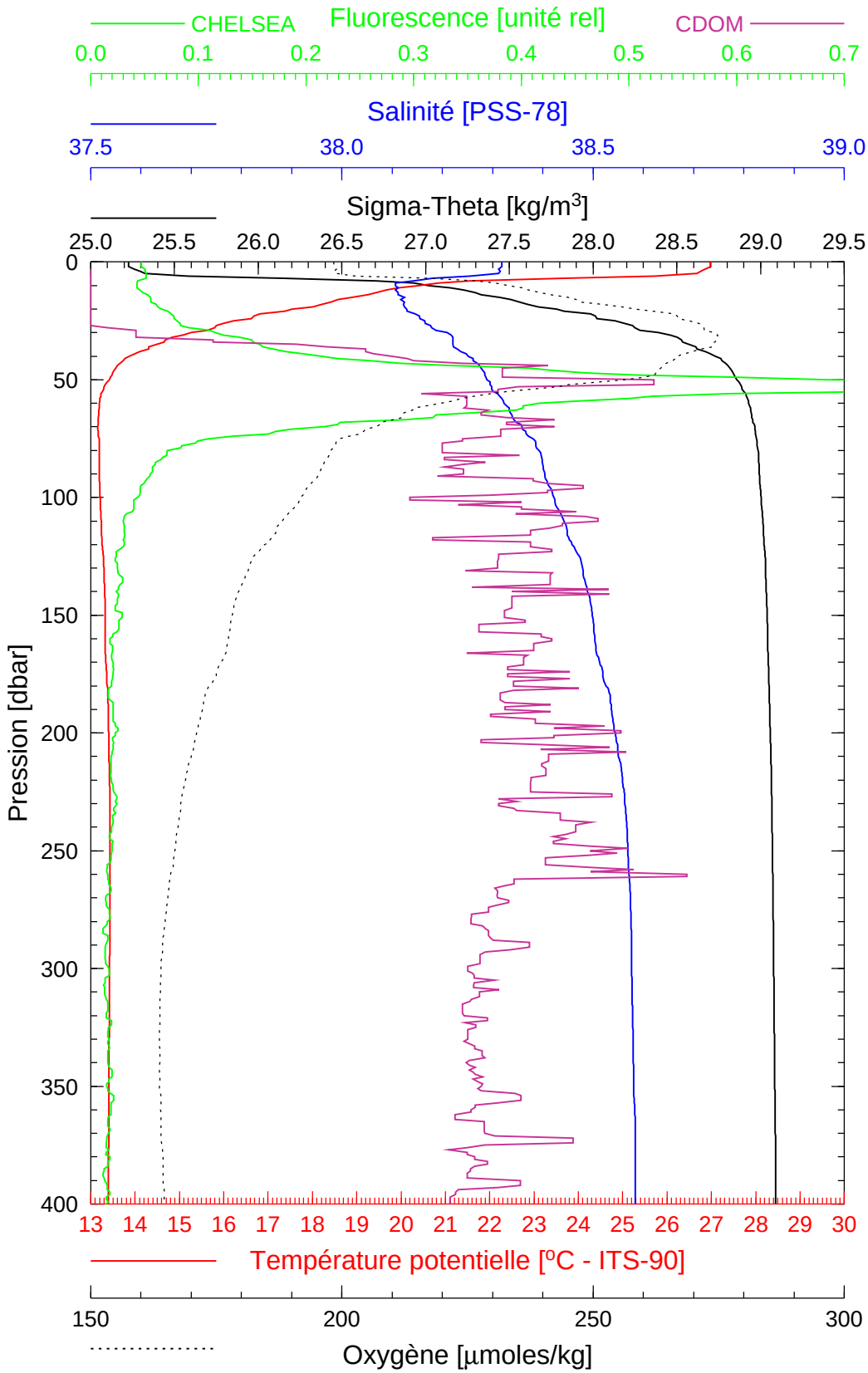


Date *27/06/2003* *Latitude* *43º37.535 N*

Heure déb *19h 47min [TU]* *Longitude* *07º24.996 E*

Boussole 23 **28/06/2003** **BOUS030628_01**

BOUS008

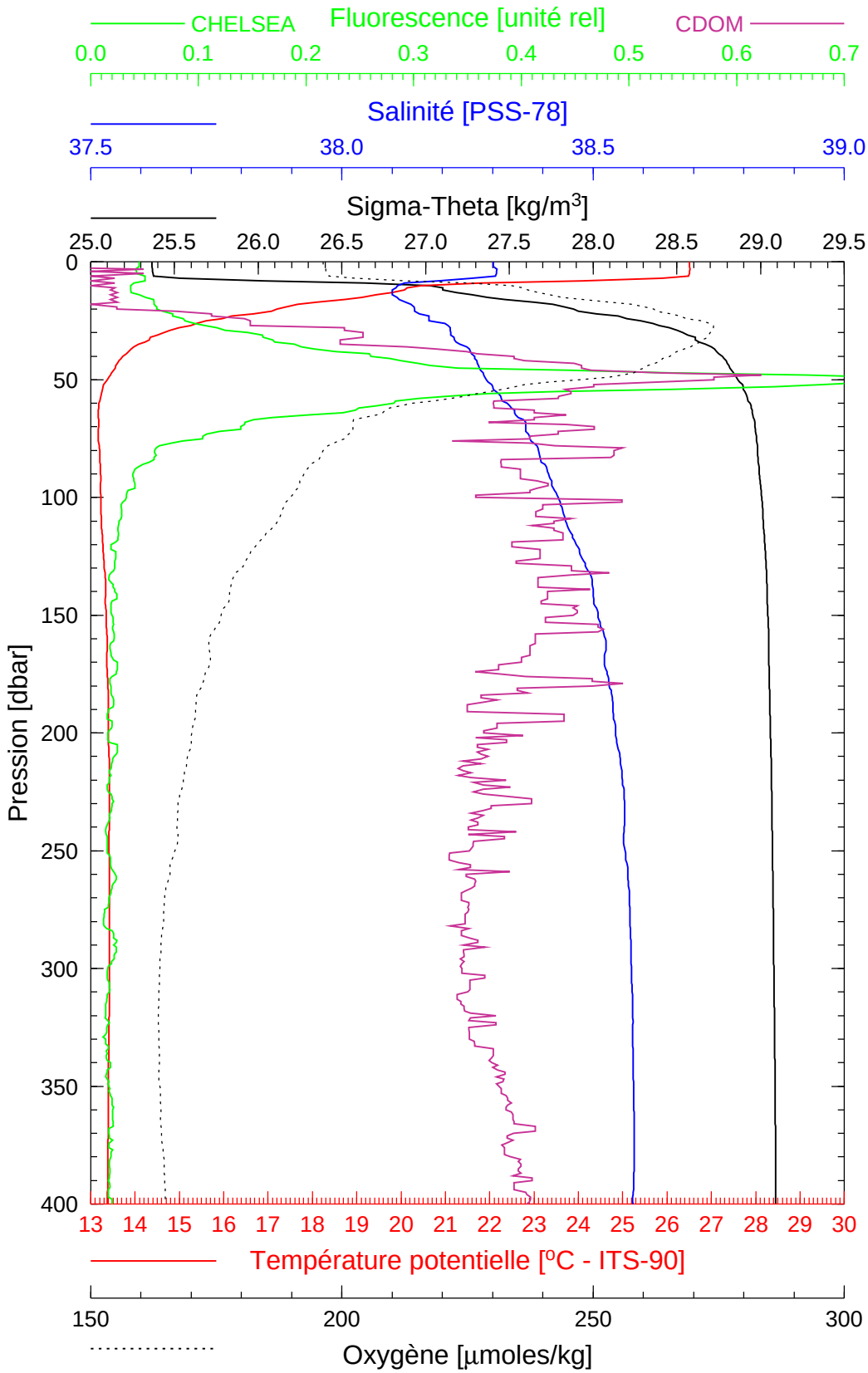


Date *28/06/2003* *Latitude* *43º22.038 N*

Heure déb *17h 30min [TU]* *Longitude* *07º54.090 E*

Boussole 23 **29/06/2003** **BOUS030629_01**

BOUS009

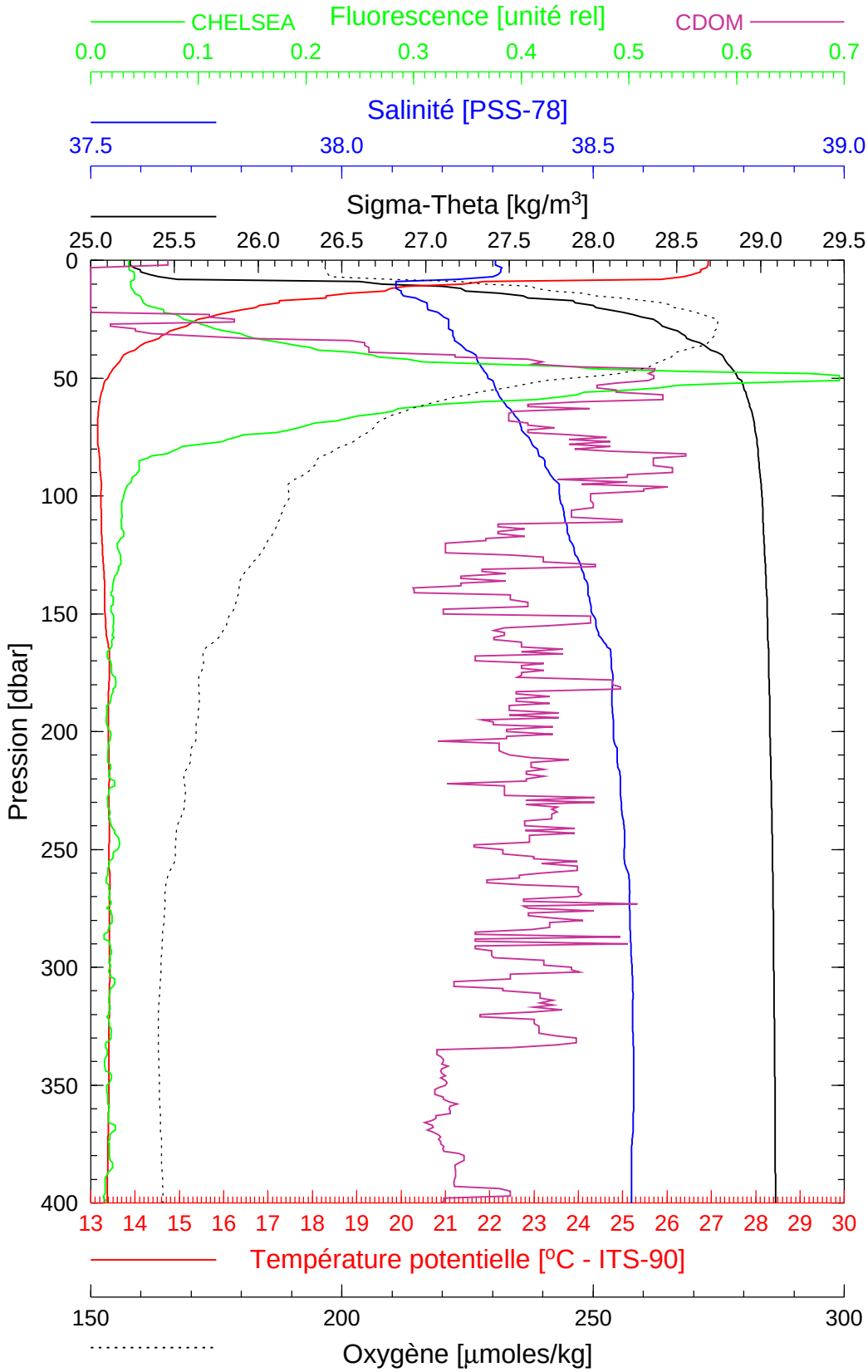


Date *29/06/2003* *Latitude* *43º22.075 N*

Heure déb *06h 35min [TU]* *Longitude* *07º54.140 E*

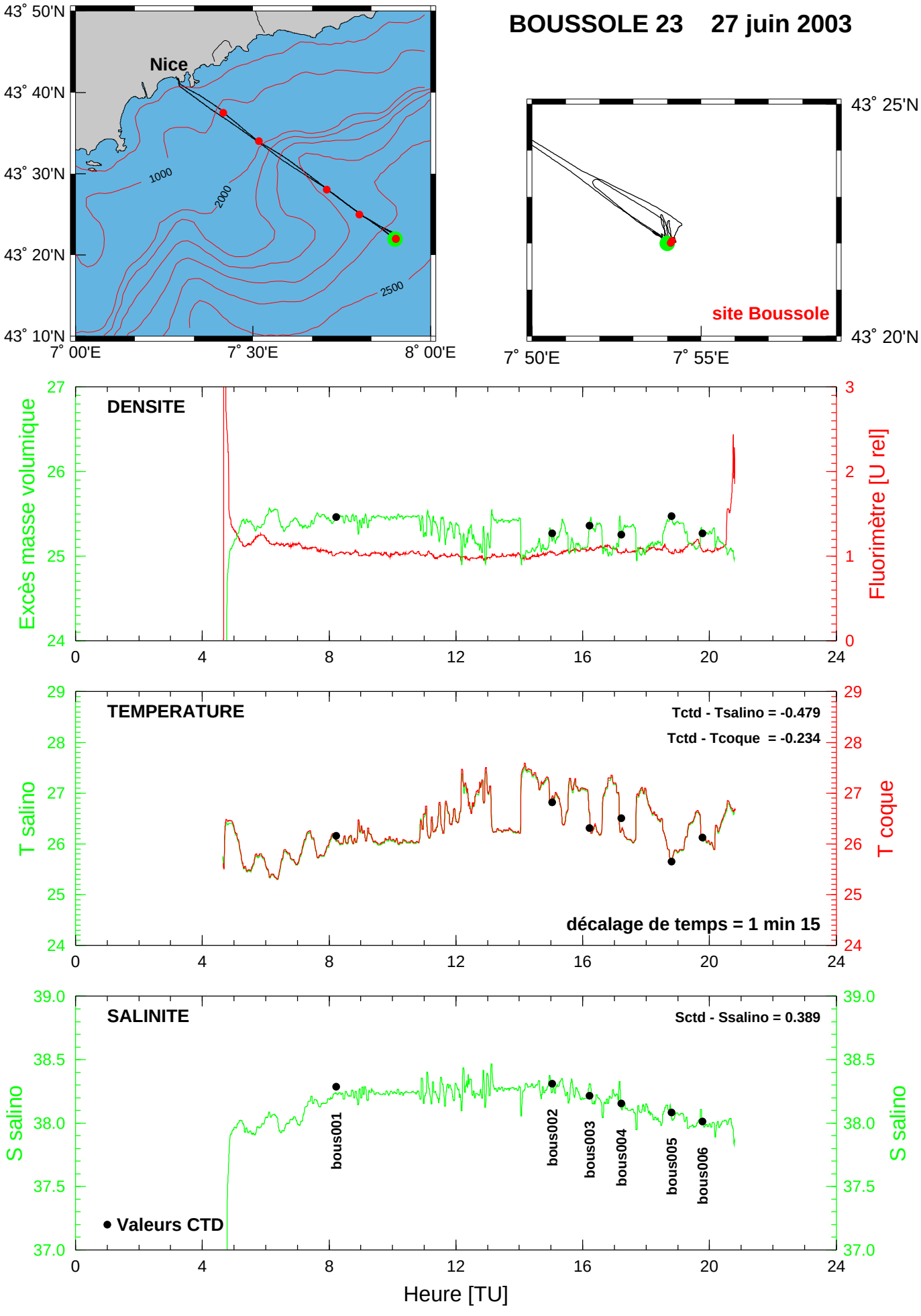
Boussole 23 **29/06/2003** **BOUS030629_02**

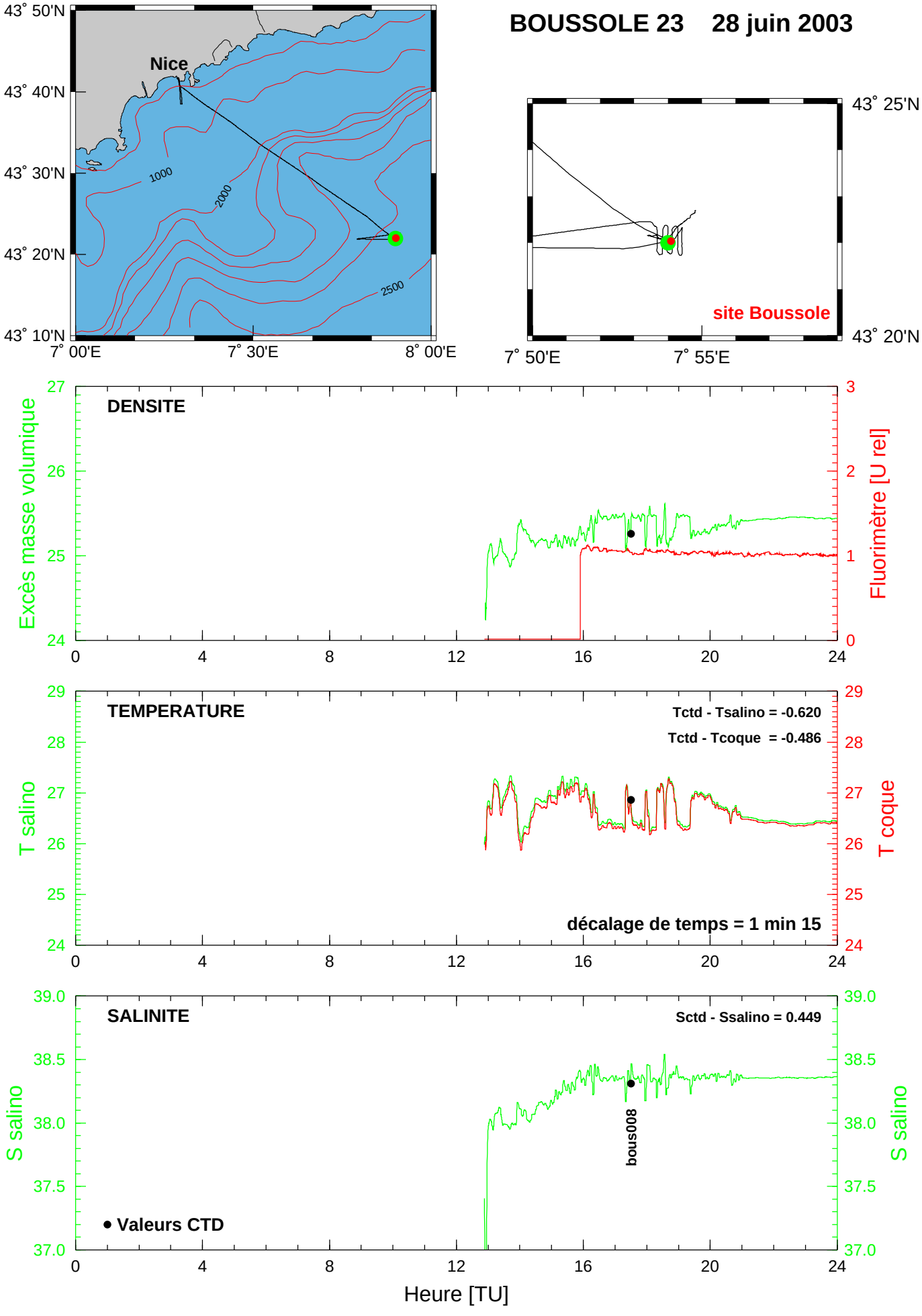
BOUS010



Date *29/06/2003* *Latitude* *43º22.060*

Heure déb *14h 53min [TU]* *Longitude* *07º54.114 E*


BOUSSOLE 23 27 juin 2003
Nice
43° 50'N
43° 40'N
43° 30'N
43° 20'N
43° 10'N
7° 00'E
7° 30'E
8° 00'E
1000
2000
2500
43° 25'N
43° 20'N
7° 50'E
7° 55'E
site Boussole
DENSITE
Excès masse volumique
Fluorimètre [U rel]
TEMPERATURE
Tctd - Tsalino = -0.479
Tctd - Tcoque = -0.234
T salino
T coque
décalage de temps = 1 min 15
SALINITE
Sctd - Ssalino = 0.389
S salino
bous001
bous002
bous003
bous004
bous005
bous006
• Valeurs CTD
Heure [TU]


BOUSSOLE 23 28 juin 2003
Nice
43° 50'N
43° 40'N
43° 30'N
43° 20'N
43° 10'N
7° 00'E
7° 30'E
8° 00'E
1000
2000
2500
43° 25'N
43° 20'N
7° 50'E
7° 55'E
site Boussole
DENSITE
Excès masse volumique
Fluorimètre [U rel]
TEMPERATURE
Tctd - Tsalino = -0.620
Tctd - Tcoque = -0.486
T salino
T coque
décalage de temps = 1 min 15
SALINITE
Sctd - Ssalino = 0.449
S salino
bous008
• Valeurs CTD
Heure [TU]