BOUSSOLE Monthly Cruise Report

Cruise 24
July 13 – 15, 2003

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Vessel: R/V Téthys II
(Captain: Alain Stépahn)

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Fig 1. Oily seas!!!!

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

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Foreword

This report is part of the technical report series that is being established by the BOUSSOLE project.

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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. If the sky is clear and sea conditions are reasonably calm (no whitecaps or large swell), SIMBADA measurements are to be performed consecutively where possible with SPMR profiles. If sea conditions are poor but sky is good, SIMBADA 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 the filters stored in LN2 for 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.

For 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 four fixed locations on-route from Boussole and a final two station positions to be decided during the transect in order to sample on both sides of the main frontal structure between the coastal waters and Ligurian Sea. The time of day of this transect should be similar for each cruise, if possible to minimise influence of diurnal variability. On other uninterrupted transits between Nice and Boussole, Simbada measurements of optical thickness should be taken every 30 minutes to characterise variability between the Cap Ferrat sun photometer site and the Boussole site.

Cruise Summary:

All three days of the cruise consisted of very good weather and fairly calm to oily seas. The provisional program was changed significantly because we were not permitted to perform CTD profiles along the transect line on the 13th July. This did not pose any problems and still allowed for an unplanned short stop in Nice to pick up some science supplies from the lab.

On the 13th, low quantities of cumulus made the timing of SPMR profiles critical in order to avoid instabilities in the light field during profiling and may reduce the possibility of a SeaWiFS matchup for the day. However, oily seas provided excellent conditions and the floating frame proved useful in delaying profiles until there was clear sky and maximum solar irradiation. The final day (15th) was the only day where Meris was in a suitable position to cover the Boussole site without too much sunglint. For a matchup, sky conditions were very good, being cloud-free and visibly more blue than the previous day. Some small swell was rolling in from the north east with some breeze but possibility of a good matchup was high.

There were numerous marine life observations including a shark, suspected to be a ‘great white’, which appeared to be inspecting the SPMR as it was being hauled in through oily calm seas. A whale was sighted close to the ship in the afternoon and a large pod of dolphins chasing a tuna shoal were seen earlier on the last day.

Three successful days of optics work were completed during this cruise that marks two years of the Boussole time series study and the French national holiday Bastille Day, July 14th.

Cruise Report (all times in GMT)

Sunday 13th July, 2003

0430 Depart Port of Nice

0750 Arrival at Boussole Site (43°22'N 7°54'E).

0759 CTD Boussole 1. Max 400m. Bottle depths (m): 200,150,120,100,70,50,40,30,20,10, 5.

0828 CTD on deck.

0848 SPMR deployed

0900 SPMR on deck (2 profiles)

1030 Commencement of quadrilateral

1130 Completion of quadrilateral

1152 SPMR surface float deployed

1220 SPMR surface float recovered (2 profiles + SeaWiFS 1219)

1229 SPMR deployed

1246 SPMR on deck (2 profiles)

1319 SPMR deployed

1350 SPMR on deck (3 profiles)

1407 CTD Boussole 2. Max 400m. Bottle depths (m): 200,150,120,100,70,55,40,30,20,10, 5.

1437 CTD on deck

1503 SPMR surface float deployed

1605 SPMR surface float recovered (2 profiles)

2230 Arrive Port of Nice

2400 Depart Port of Nice

Monday 14th July, 2003

0630 Arrival at Boussole Site

0649 CTD Boussole 3. Max 400m. Bottle depths (m): 200,100,80,65,50,40,30,20,10, 5

0719 CTD on deck

0732 SPMR surface float deployed

0800 SPMR surface float recovered (2 profiles)

0840 SPMR deployed.

0920 SPMR on deck (4 profiles).

1028 CTD Boussole 4. Max 400m. Bottle depths (m): 10, 5

1053 CTD on deck

1105 SPMR surface float deployed

1115 SPMR surface float recovered (1 profile)

1117 SPMR deployed.

1140 SPMR on deck (3 profiles + SeaWiFS 1121)

1149 SPMR surface float deployed

1200 SPMR surface float recovered (1 profile)

1252 SPMR surface float deployed

1302 SPMR surface float recovered (1 profile + SeaWiFS 1259)

1305 SPMR deployed.

1325 SPMR on deck (2 profiles)

1329 SPMR surface float deployed

1350 SPMR surface float recovered (1 profile)

1405 CTD Boussole 5. Max 400m. Boussole Site.

1502 CTD Boussole 6. Max 400m. Transect Station 1 (43°25'N 7°28'E).

1600 CTD Boussole 7. Max 400m. Transect Station 2 (43°28'N 7°42'E).

1709 CTD Boussole 8. Max 400m. Transect Station 3 (43°31'N 7°37'E).

1811 CTD Boussole 9. Max 400m. Transect Station 4 (43°34'N 7°31'E).

1912 CTD Boussole 10. Max 400m. Transect Station 5 (43°37'N 7°25'E).

2002 CTD Boussole 11. Max 400m. Transect Station 6 (43°39'N 7°21'E).

2030 Remain in vicinity of Boussole

Tuesday 15th July, 2003

0615 Relocate on Boussole Site

0622 CTD Boussole 12. Max 400m. Bottle Depths (m) 200,150,120,100,70,50,40,30,20,10, 5.

0651 CTD on deck

0708 SPMR surface float in water

0735 SPMR surface float on deck (2 profiles)

0825 SPMR in water

0855 SPMR on deck (3 profiles)

0957 SPMR in water

1050 SPMR on deck (4 profiles)

1114 CTD Boussole 13. Max 400m. Bottle depths (m): 10, 5

1139 CTD on deck

1145 SPMR in water

1315 SPMR on deck (5 profiles + SeaWiFS 1202 + Meris 1126)

1324 SPMR surface float in water

1334 SPMR surface float on deck (1 profiles)

1353 CTD Boussole 14. Max 400m. Bottle Depths (m) 200,150,120,100,70,50,40,30,20,10, 5

1422 CTD on deck

1425 Depart Boussole Site for Port of Nice

1425-1700 Simbada measurements every 30 minutes

1730 Arrive Port of Nice

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

SeaWiFS (times in GMT)

13 Jul 2003 12:19 at 66.33 degrees elevation

14 Jul 2003 11:21 at 26.47 degrees elevation

14 Jul 2003 12:59 at 31.10 degrees elevation

15 Jul 2003 12:02 at 61.34 degrees elevation

Meris (times in GMT)

15 Jul 2003 10:01 (source GSFC) 09:23 (source ESOV)

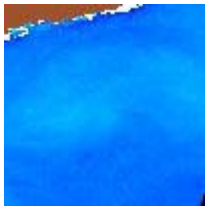
Ligurian Sea Boussole Site Images

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

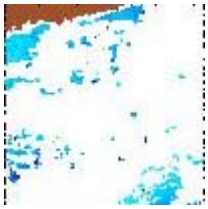
SeaWiFS

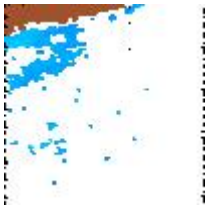




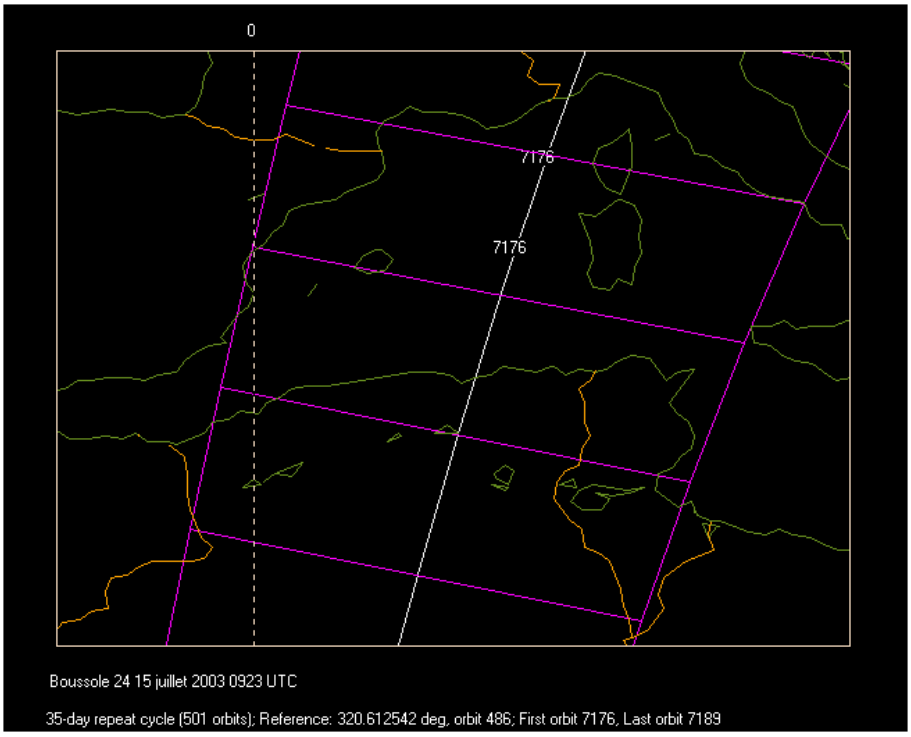
Modis



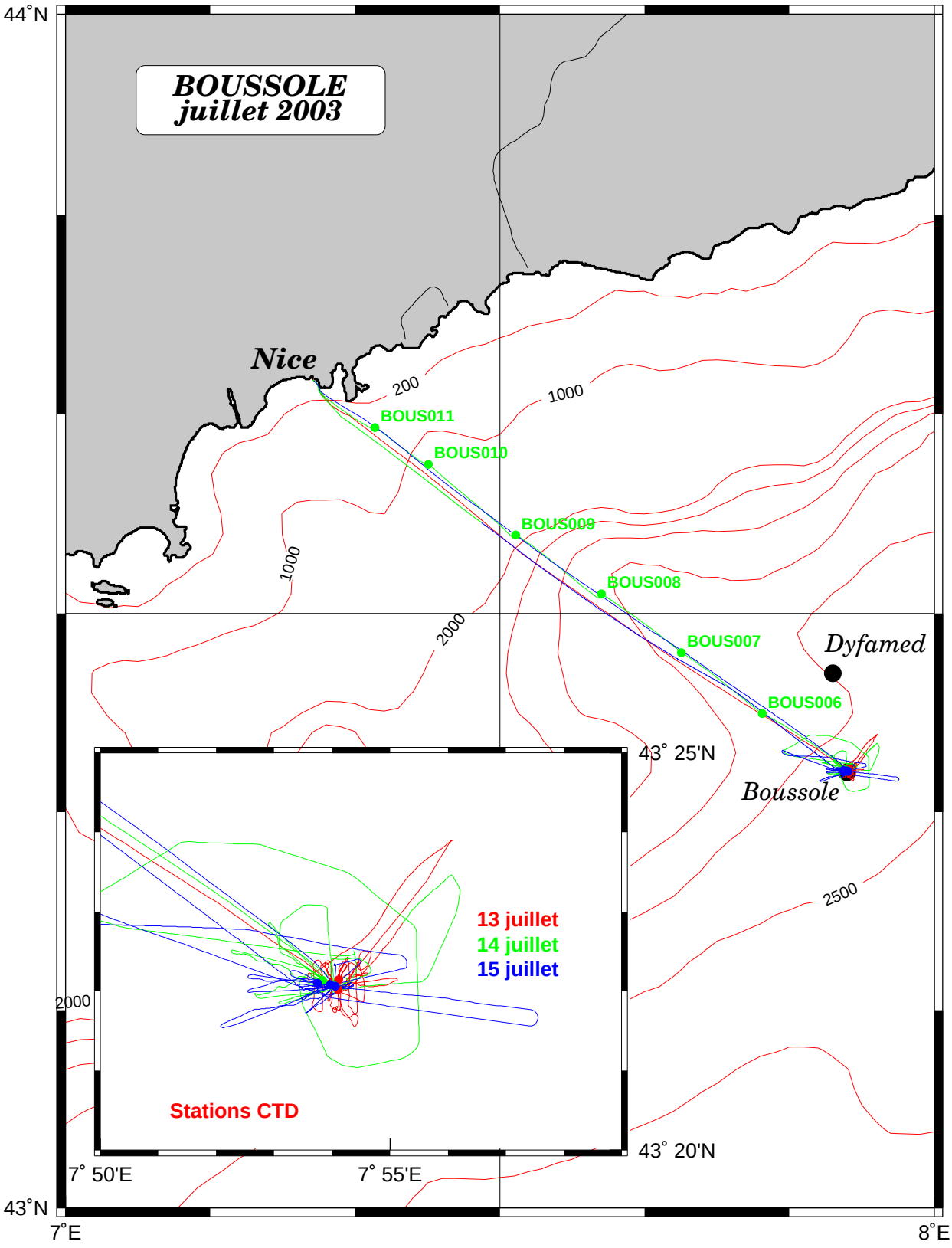
July 13th 2003 July 14th 2003 July 15th 2003

Calculated Swath paths for Modis Sensor (ESOV Software)



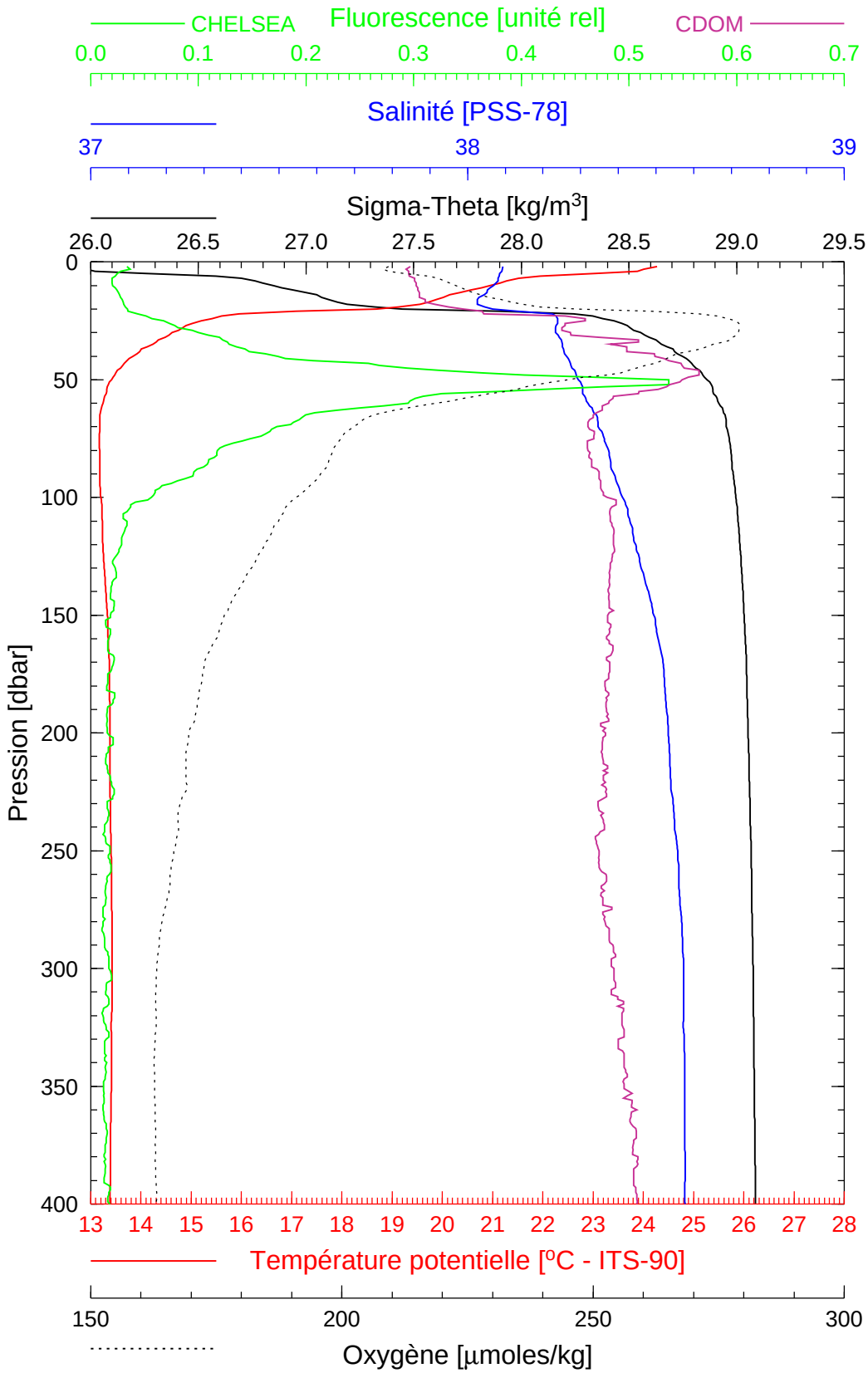
Tabulated Cruise Summary for Boussole 24

Date	Sensors:	Black names	Profile names	CTD notées /	Start Time	Duration	Depth max	Latitude (N)		50		Other sensors	Their 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)	(hyperspectral:HS)			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
13/07/03				CTDBOUS001	7.59	29:00	400	43	22.144	7	54.117							0	2	167	1015.5	84		24.4	24.3	calm			
	spmr&smsr	bou130703black1			8.36	03:00																						
			bou130703a		8.50	01:02	50	43	21.768	7	54.136			PAR20030713A		milky	cumulus	5	3	114	1015.3	81	fair	24.3		glassy			
			bou130703b		8.57	04:04	200	43	21.7	7	54.217			PAR20030713A	1(start)	milky	cumulus	5	3	114	1015.3	81	fair	24.3		glassy			
		bou130703black2			9.22	00:03																						
				Quadrilatere 001	10.36		5	43	22.35	7	54.443																		
				Quadrilatere 002	10.58		5	43	21.774	7	54.069																		
				Quadrilatere 003	11.21		5	43	22.352	7	53.688																		
		bou130703black3			11.25	03:00																						
			bou130703spmratsurface1		11.54		200	43	22.212	7	54.312			PAR20030713B	1,2,3	milky	cumulus	3	3	152	1014.3	78	good	25.6		glassy			
			bou130703spmratsurface2	SeaWiFS 1219	12.14	47:00	150	43	22.111	7	54.313			PAR20030713B	4,5,6	milky	cumulus	3	3	152	1014.3	78	good	25.6		glassy			
			bou130703c		12.31	09:47	100	43	22.059	7	54.695			PAR20030713B	7,8	milky	cumulus	3	3	152	1014.3	78	good	25.6		glassy			
			bou130703d		12.41	04:12	200	43	22.073	7	54.94			PAR20030713B	9,10	milky	cumulus	3	3	152	1014.3	78	good	25.6					
		bou130703black4			13:00	03:00						Simbada	13:10															
			bou130703e		13:21	04:13	200	43	22.14	7	54.103	Simbada	13:23	PAR20030713C	1,2	milky	cumulus	1	4	196	1013.5	80	good	25.5					
			bou130703f		13:33	03:58	200	43	22.286	7	54.152	Simbada	13:35	PAR20030713C	3,4	milky	cumulus	1	4	196	1013.5	80	good	25.5					
			bou130703g		13:43		200	43	22.362	7	54.213	Simbada	13:46	PAR20030713C	5,6	milky	cumulus	1	4	196	1013.5	80	good	25.5					
		bou130703black5			13:59	03:00																						
				CTDBOUS002	14.07	30:00	400	43	22.018	7	54.106							3	4	176	1013.2	80		25.3	24.5	calm			
		bou130703black6			14.58	03:00																						
			bou130703spmratsurface3		15.05	06:19	150	43	22.206	7	53.959			PAR20030713D	1,2,3	milky	cumulus	1	7	226	1012.8	81	good	25			0.1		
			bou130703spmratsurface4		15.55	06:57	180	43	22.163	7	54.182			PAR20030713E		milky	cumulus	1	7	226	1012.8	81	good	25			0.1		
		bou130703black7			16.12	03:00																						
14/07/03				CTDBOUS003	6.49	30:00	400	43	22.14	7	53.838							3	6	40	1012.2	86		25.3	24.2	calm			
		bou140703black1			7.17	03:00																						
			bou140703spmratsurface1		7.34		200	43	22.141	7	53.372			PAR20030714A	1,2,3	very milky	clear	0	10	50	1012.2	79	good	27		Bit choppy	0.3-0.4	350	few
			bou140703spmratsurface2		7.54	06:37	200	43	22.04	7	53.04			PAR20030714A	4,5,6	very milky	clear	0	10	50	1012.2	79	good	27		Bit choppy	0.3-0.4	350	few
		bou140703black2			8.11	03:00																						
		bou140703black3			8.30	03:00																						
			bou140703a		8.41		200	43	22.073	7	54.028	Simbada	08:40	PAR20030714B	1,2	milky	cumulus	1	8	60	1012.4	75	good	26.4		Bit choppy	0.2-0.3		0
			bou140703b		8.49		200	43	22.027	7	53.88	Simbada	08:53	PAR20030714B	3,4	milky	cumulus	1	8	60	1012.4	75	good	26.4		Bit choppy	0.2-0.3		0
			bou140703c		9.02		200	43	21.981	7	53.611	Simbada	09:05	PAR20030714B	5,6	milky	cumulus	1	8	60	1012.4	75	good	26.4		Bit choppy	0.2-0.3		0
			bou140703d		9.15		200	43	21.981	7	53.333	Simbada	09:15	PAR20030714B	7,8	milky	cumulus	1	8	60	1012.4	75	good	26.4		Bit choppy	0.2-0.3		0
		bou140703black4			9.30	03:00																						
				CTDBOUS004	10.28	25:00	400	43	22.076	7	54.014							1	6	24	1012.5	83		25.1	24.6	calm			
		bou140703black5			10.54	03:00																						
			bou140703spmratsurface3		11.07		200	43	22.11	7	53.574			PAR20030714C	1,2,3	milky	clear	0	7	48	1012.4	84	good	25.6			0.1		
			bou140703e		11.18	01:23	50	43	22.246	7	53.281	Simbada	11:20	PAR20030714C	4,5	milky	clear	0	7	48	1012.4	84	good	25.6			0.1		
			bou140703f	SeaWiFS 1121	11.22	04:00	200	43	22.289	7	53.215			PAR20030714C	6,7	milky	clear	0	7	48	1012.4	84	good	25.6			0.1		
			bou140703g		11.32	04:06	200	43	22.342	7	53.034	Simbada	11:37	PAR20030714C	8,9	milky	clear	0	7	48	1012.4	84	good	25.6			0.1		
			bou140703spmratsurface4		11.50	06:35	200	43	22.427	7	52.632	Simbada	11:53	PAR20030714C	10,11,12	milky	clear	0	7	48	1012.2	83	good	25.6			0.1	50	0
		bou140703black6			12.07	03:00																						
		bou140703black7			12.48																							
			bou140703spmratsurface5	SeaWiFS 1259	12.53		200	43	22.1	7	53.893	Simbada	12:59	PAR20030714D	1,2,3	milky	clear	0			1012.1	83	good	25.7			0.1		0
			bou140703h		13.07		200	43	22.273	7	53.617	Simbada	13:10	PAR20030714D	4,5	milky	clear	0			1012.1	83	good	25.7			0.1		0
			bou140703i		13.18		200	43	22.357	7	53.393	Simbada	13:21	PAR20030714D	6,7	milky	clear	0			1012.1	83	good	25.7			0.1		0
			bou140703spmratsurface6		13.30	04:05	10	43	22.5225	7	53.225			PAR20030714D	8	milky	clear	0			1012.1	83	good	25.7			0.1		0
			bou140703spmratsurface7		13.42	02:56	200	43	22.688	7	53.057	Simbada	13:43	PAR20030714D	10,11,12	milky	clear	0			1012.1	83	good	25.7			0.1		0
				CTDBOUS005	14.05	24:00	400	43	22.084	7	54.021							2	4	70	1011.9	82		26	25.2	calm			
				CTDBOUS006	15.02	22:00	400	43	24.969	7	48.14							1	2	55	1011.7	79		25.9	25.6	calm/flat			
				CTDBOUS007	16.00	24:00	400	43	28.034	7	42.535	Simbada	15:50					0	2	330	1011.6	80		26	25.4	calm/flat			
				CTDBOUS008	17.09	25:00	400	43	31.001	7	37.015							0	2	298	1011.1	77		26.1	25.4	calm/flat			
				CTDBOUS009	18.11	23:00	400	43	33.953	7	31.1							0	3	304	1011.1	77		25.8	25.4	calm			
				CTDBOUS010	19.12	26:00	400	43	37.496	7	25.046							0	4	298	1011.2	71		27.6	24.8	calm/flat			
				CTDBOUS011	20.02	26:00	400	43	39.33	7	21.358							9	2	286	1011.6	69		26.4	26.7				
15/07/03				CTDBOUS012	6.22	29:00	400	43	22.102	7	53.752							2	9	56	1012.9	82		24.9	24.6	little choppy			
		bou150703black1			6.50	03:00																						
			bou150703spmratsurface1		7.09	05:48	150	43	22.06	7	53.814			PAR20030715A	1,2,3	milky	clear	0	10	41	1012.8	81	good	25.3		little choppy	0.3-0.4		few
			bou150703spmratsurface2		7.29	04:33	150	43	22.06	7	53.814			PAR20030715A	4,5,6	milky	clear	0	10	41	1012.8	81	good	25.3		little choppy	0.3-0.4		few
		bou150703black2			8.18	03:00																						
			bou150703a		8.26	04:14	200	43	22.031	7	54.038			PAR20030715B	1,2				13	53	1012.7	76	good	25.3		choppy	0.5		some
			bou150703b		8.37		200	43	21.974	7	54.06			PAR20030715B	3,4				13	53	1012.7	76	good	25.3		choppy	0.5		some
			bou150703c		8.47		200	43	21.834	7	54.022			PAR20030715B	5,6				13	53	1012.7	76	good	25.3		choppy	0.5		some
		bou150703black3			9.05	03:00																						
		bou150703black4			9.52	03:00																						
			bou150703d	Meris 0923	9.58	03:51	200	43	21.935	7	53.832			PAR20030715B	7,8	milky	clear	0	12	59	1013.1	76	good	25.7		choppy	0.4-0.5	50	some
			bou150703e		10.11	04:02	200	43	21.881	7	53.522	Simbada	10:07	PAR20030715B	9,10	milky	clear	0	12	59	1013.1	76	good	25.7		choppy	0.4-0.5	50	some
			bou150703f		10.26	04:09	200	43	21.8	7	53.025	Simbada	10:22	PAR20030715B	11,12	milky	clear	0	12	59	1013.1	76	good	25.7		choppy	0.4-0.5	50	some
			bou150703g		10.41		200	43	21.728	7	52.507	Simbada	10:36	PAR20030715B	13,14	milky	clear	0	12	59	1013.1	76	good	25.7		choppy	0.4-0.5	50	some
		bou150703black5			11.00	03:00																						
				CTDBOUS013	11.14	25:00	400	43	22.08	7	53.971							1	12	67	1013.1	78		25.3	24.4	little choppy			
		bou150703black6			11.43	03:00																						
			bou150703h		0.00	03:58	200	43	22.098	7	53.828			PAR20030715C	1,2	very milky	clear	0	10	60	1013	79	good	25		little choppy	0.3		some
			bou150703i		11.54	04:21	200	43	22.155	7	53.409	Simbada	11:58	PAR20030715C	3,4	very milky	clear	0	10	60	1013	79	good	25		little choppy	0.3		some
			bou150703j	SeaWiFS 1202	12.05	03:53	200	43	22.107	7	52.962			PAR20030715C	5,6	very milky	clear	0	10	60	1013	79	good	25		little choppy	0.3		some
			bou150703k		12.20		200	43	22.107	7	52.962			PAR20030715C	5,6	very milky	clear	0	10	60	1013	79	good	25		little choppy	0.3		some
			bou150703l		12.54	04:01	200	43	22.118	7	53.734			PAR20030715D	1(end)	milky	clear	0	6	72	1012.8	77	good	24.5		little choppy	0.3-0.5		a few
			bou150703m		13.09		200	43	22.131	7	53.326			PAR20030715D	2,3	milky	clear	0	6	72	1012.8	77	good	24.5		little choppy	0.3-0.5		a few
			bou150703spmratsurface3		13.25		200	43	22.127	7	52.944			PAR20030715D	4,5,6	milky	clear	0	6	72	1012.8	77	good	24.5		little choppy	0.3-0.5		a few
		bou150703black7			13.42	03:00																						
				CTDBOUS014	13.53	29:00	400	43	22.064	7	54.053							0	6	85	1013	84		25.3	24.8	calm			
												Simbada	14:28						4		1013								
												Simbada	15:05						6		1012.5								
												Simbada	15:33						7		1012.3								
												Simbada	16:03						4		1012.2								
												Simbada	16:31						5		1011.9								
												Simbada	17:05						4		1012								



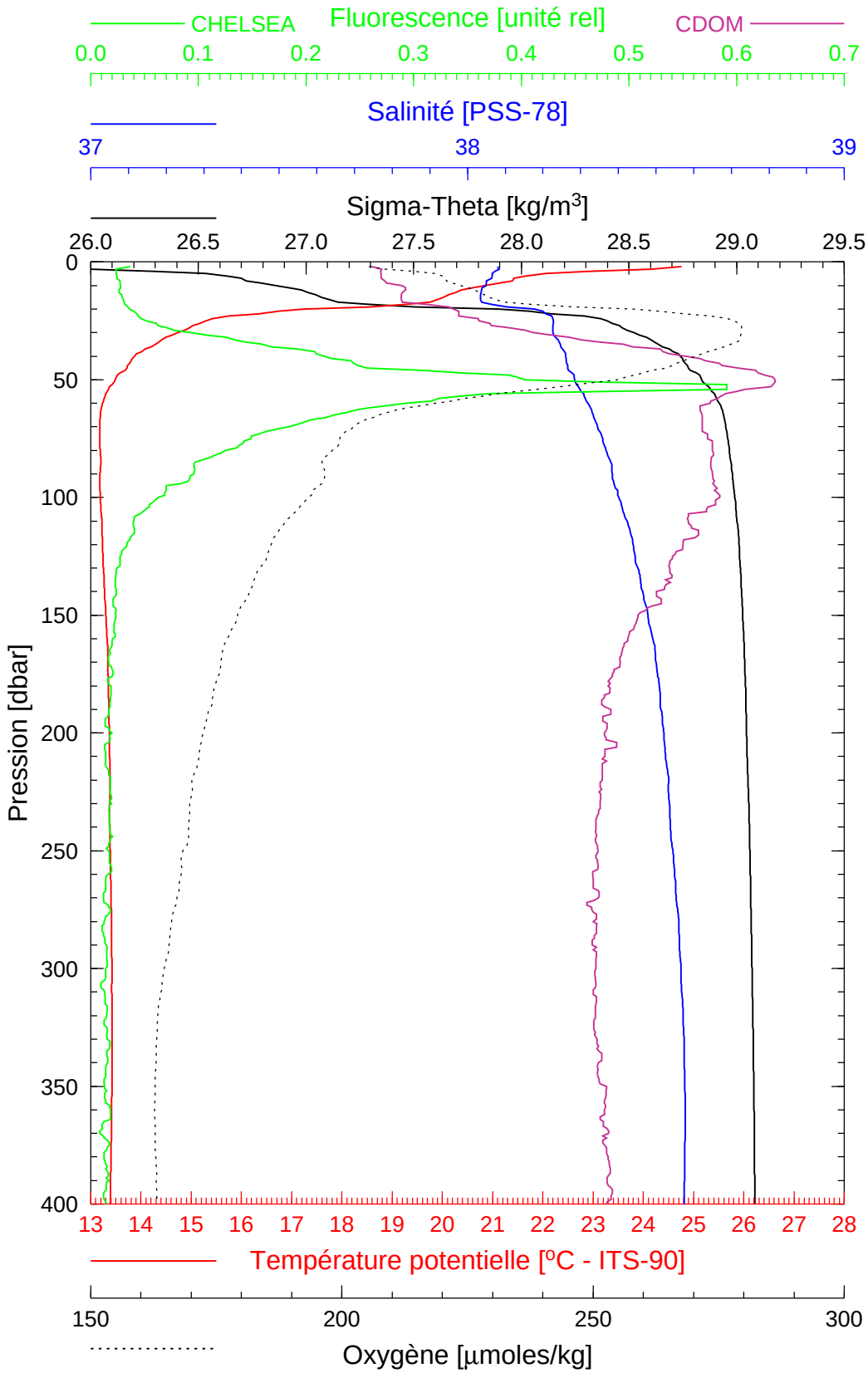
GMT 2003 Jul 16 10:09:14

Boussole 24 **Juillet 2003** **bous001**



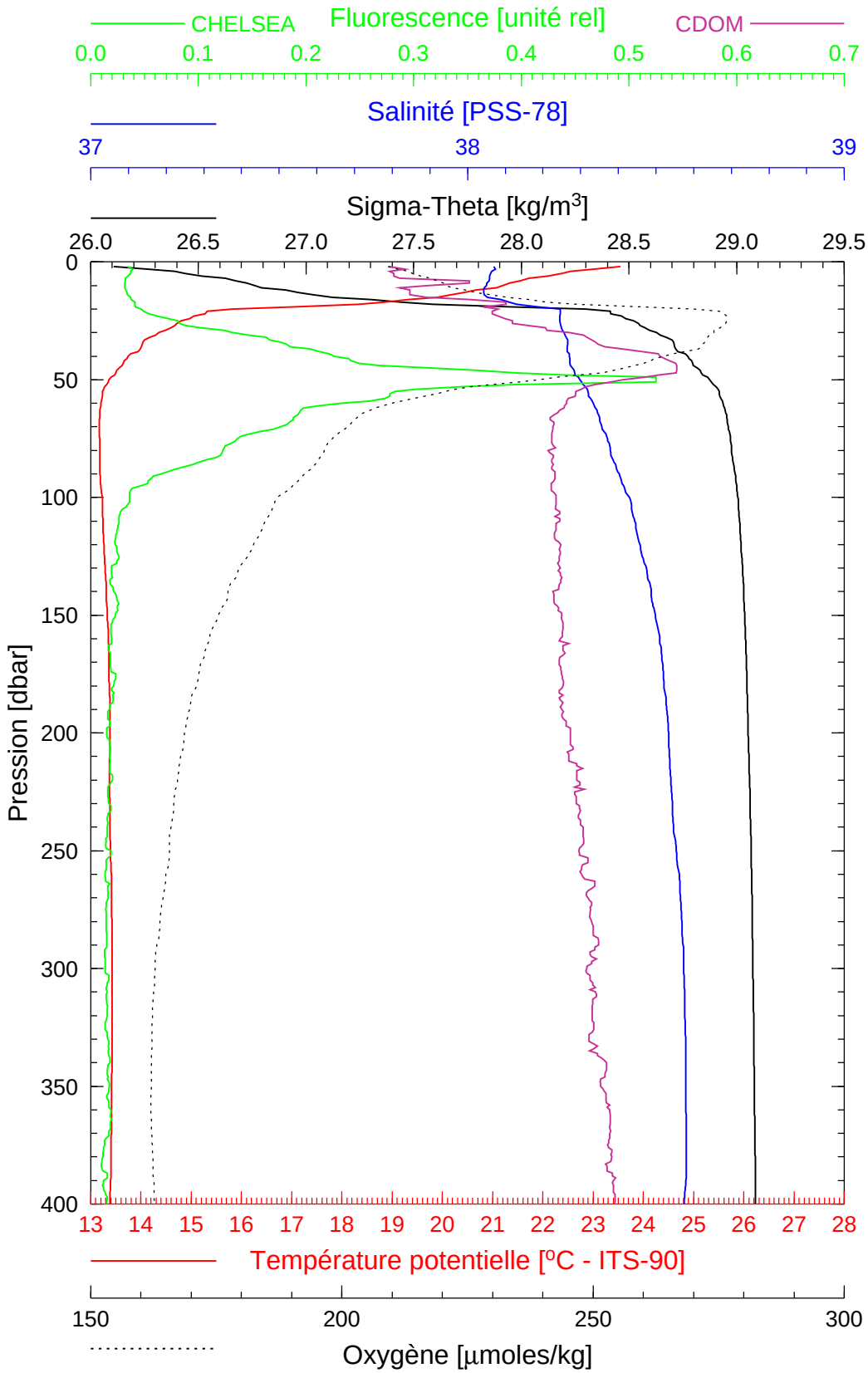
Date *13/07/2003* *Latitude* *43°22.144 N*
Heure déb *07h 59min [TU]* *Longitude* *07°54.117 E*

Boussole 24 **Juillet 2003** **bous002**



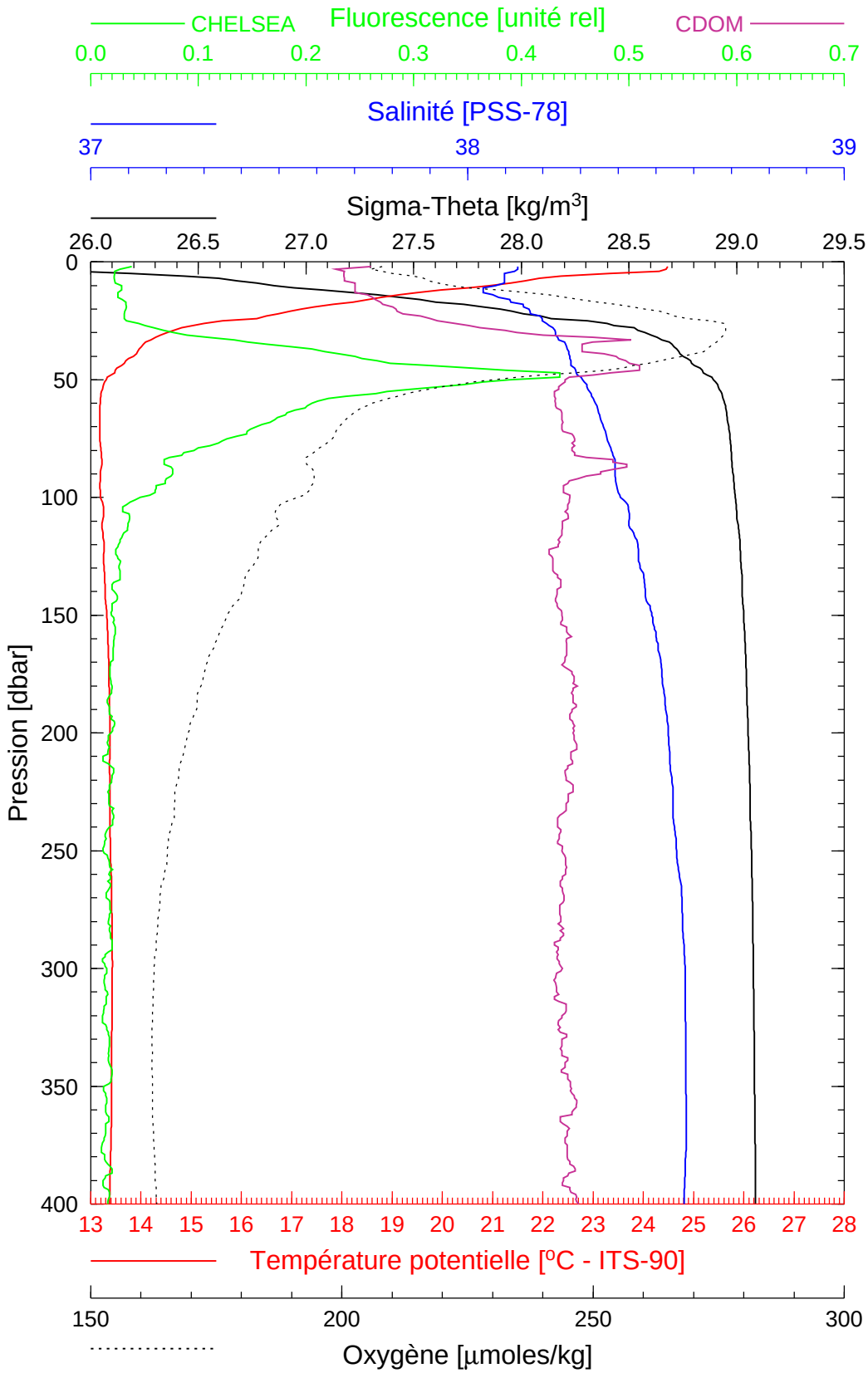
Date *13/07/2003* *Latitude* *43º22.018 N*
Heure déb *14h 07min [TU]* *Longitude* *07º54.106 E*

Boussole 24 **Juillet 2003** **bous003**



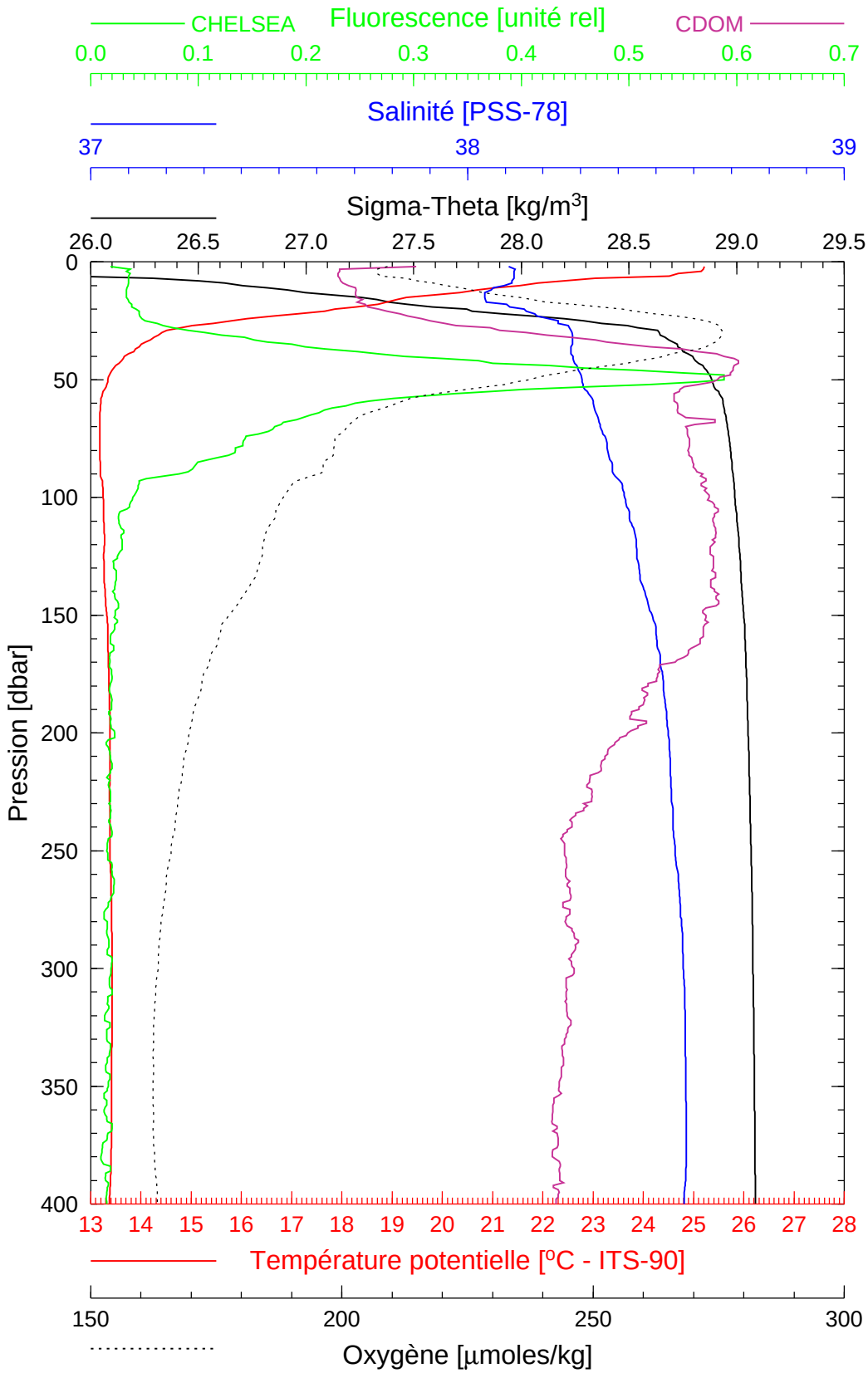
Date *14/07/2003* *Latitude* *43º22.140 N*
Heure déb *06h 49min [TU]* *Longitude* *07º53.838 E*

Boussole 24 **Juillet 2003** **bous004**



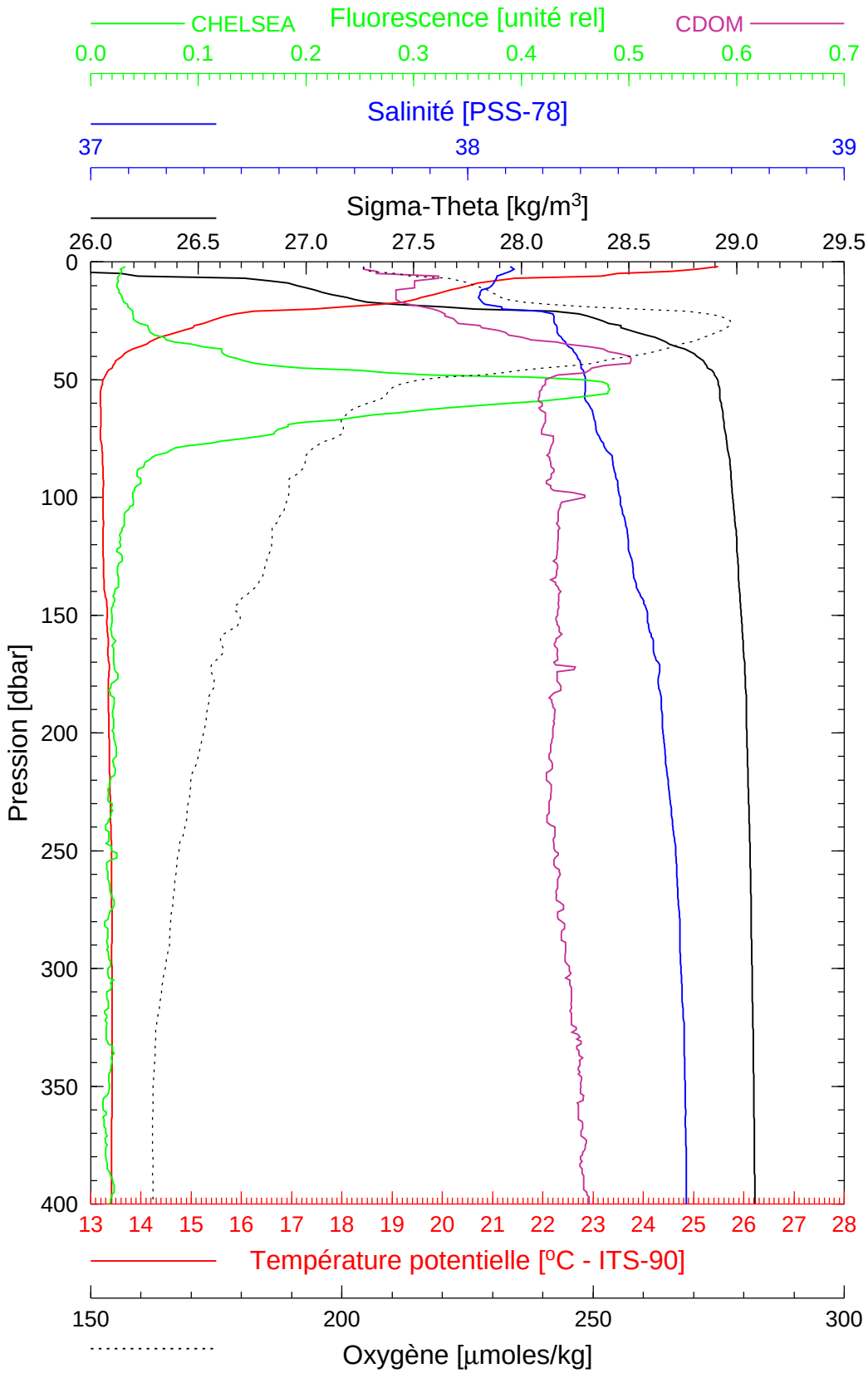
Date *14/07/2003* *Latitude* *43º22.076 N*
Heure déb *10h 28min [TU]* *Longitude* *07º54.014 E*

Boussole 24 **Juillet 2003** **bous005**



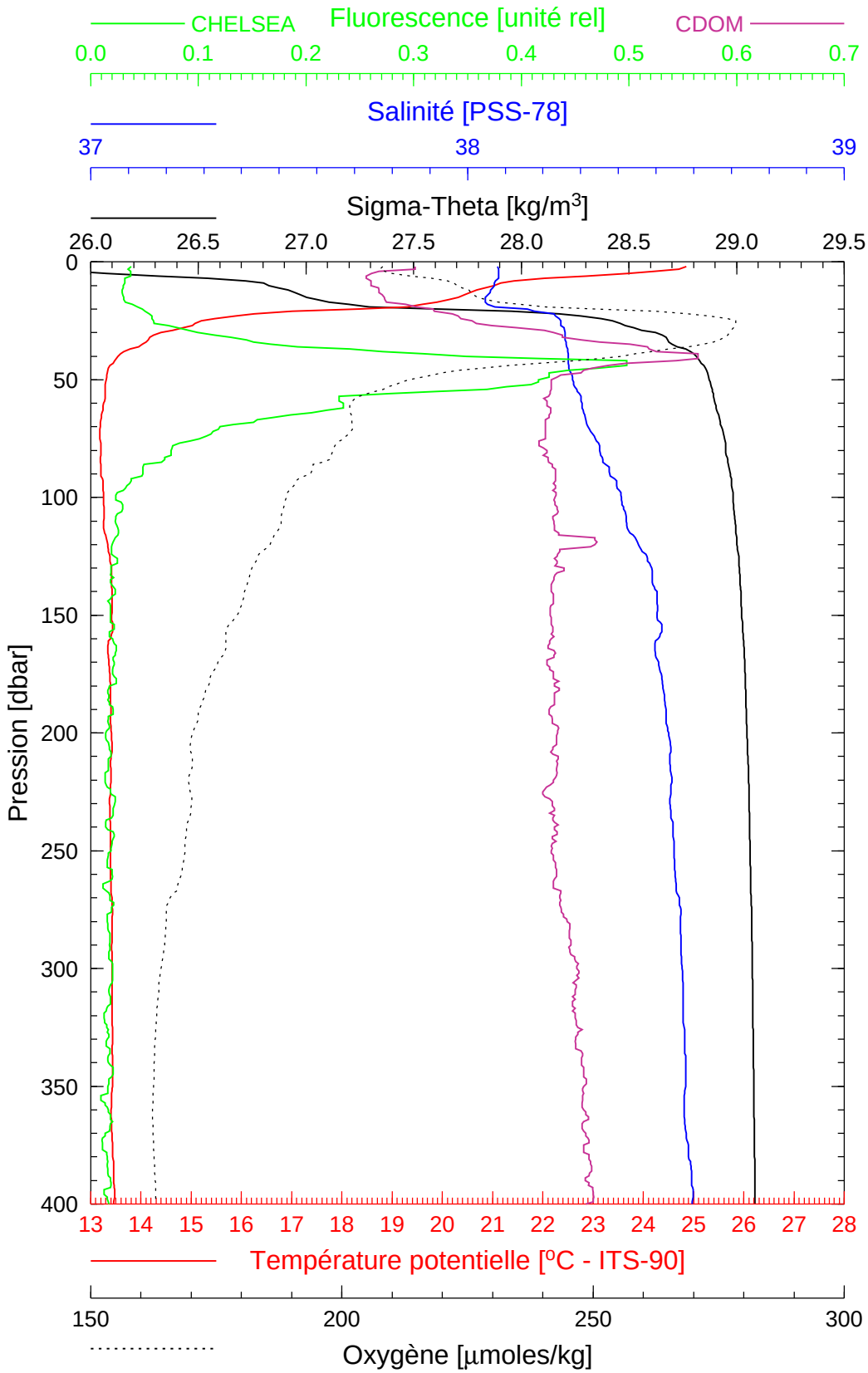
Date *14/07/2003* *Latitude* *43°22.084 N*
Heure déb *14h 05min [TU]* *Longitude* *07°54.021 E*

Boussole 24 **Juillet 2003** **bous006**



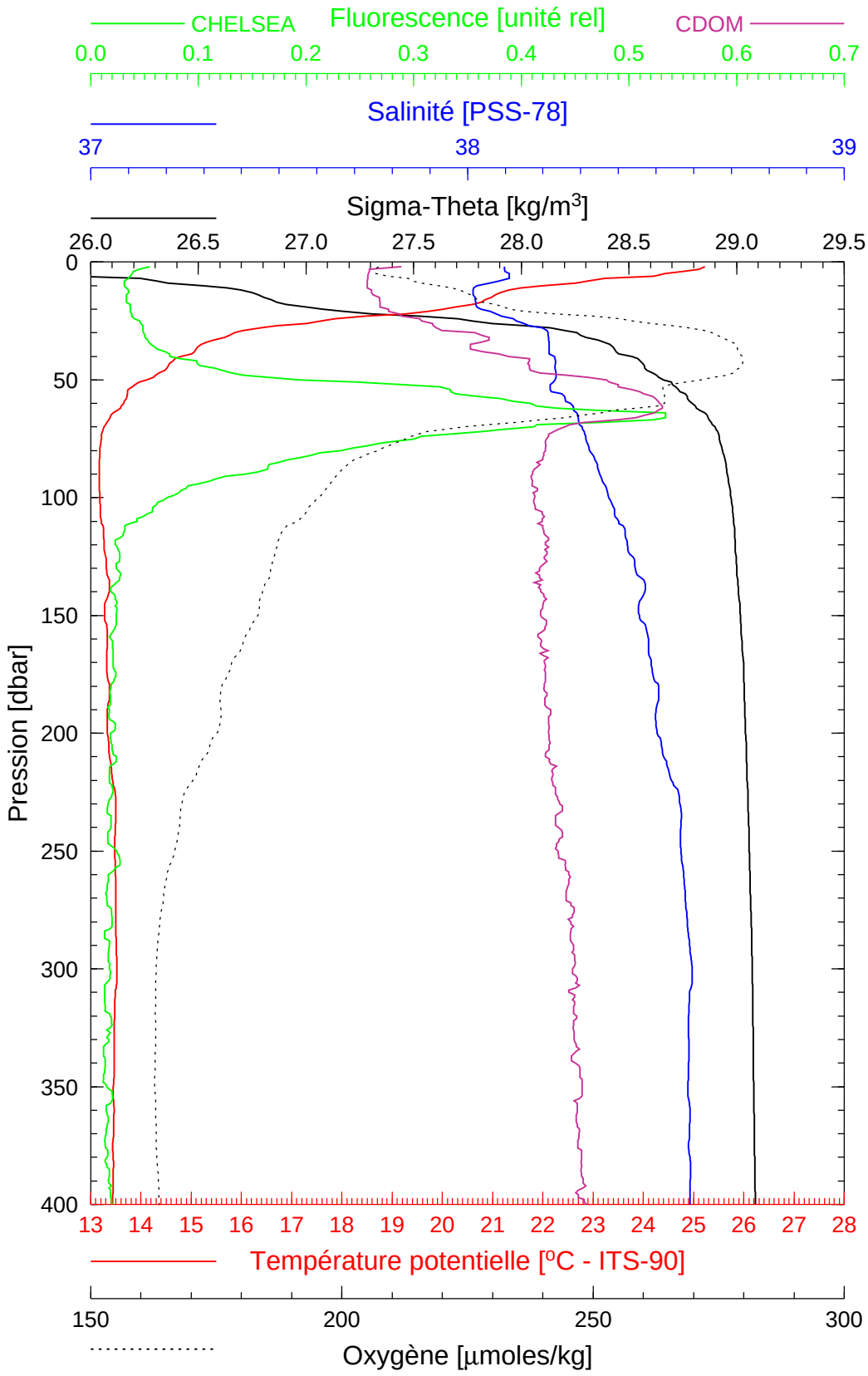
Date *14/07/2003* *Latitude* *43°24.969 N*
Heure déb *15h 02min [TU]* *Longitude* *07°48.140 E*

Boussole 24 **Juillet 2003** **bous007**



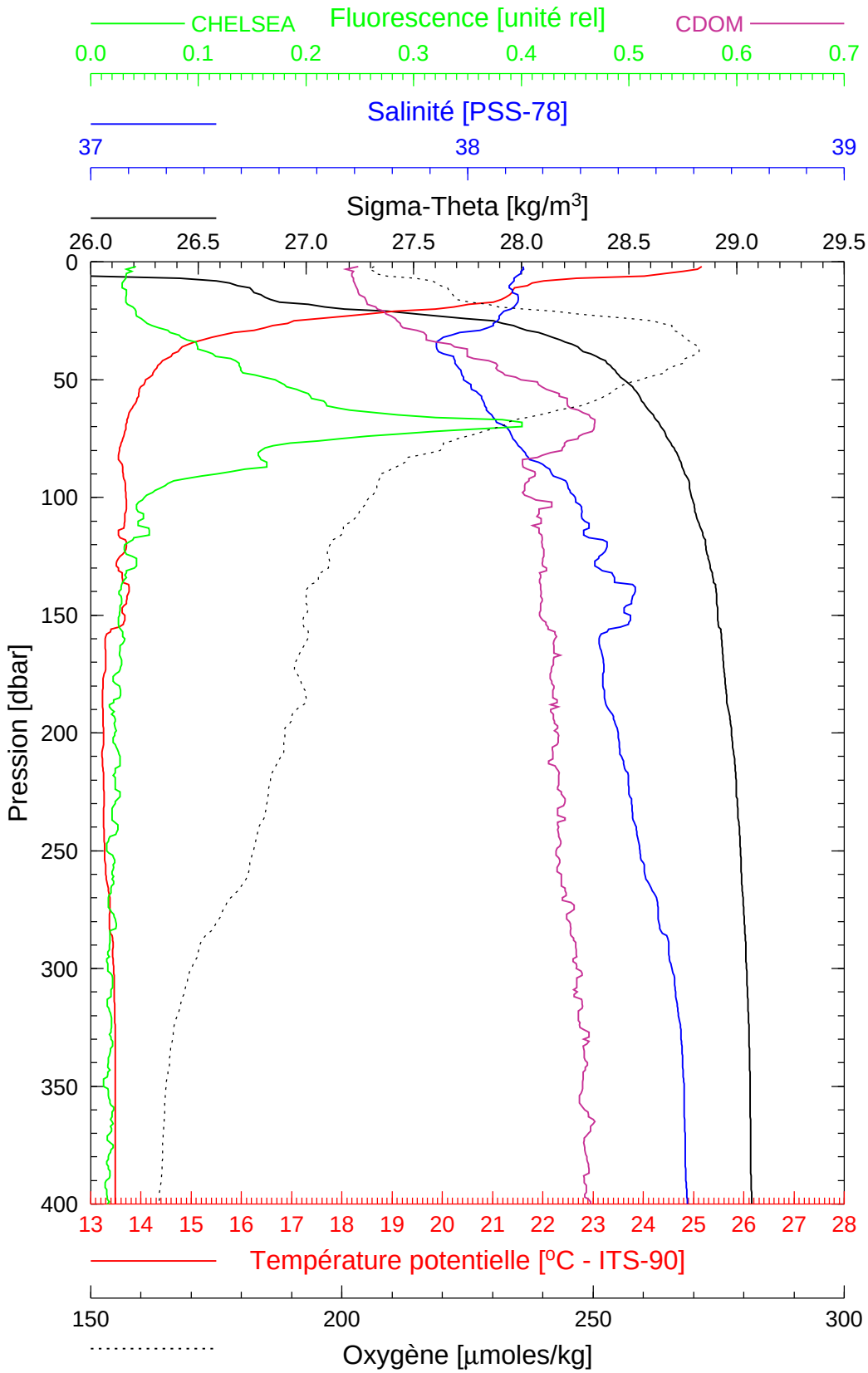
Date *14/07/2003* *Latitude* *43º28.034 N*
Heure déb *16h 00min [TU]* *Longitude* *07º42.535 E*

Boussole 24 **Juillet 2003** **bous008**



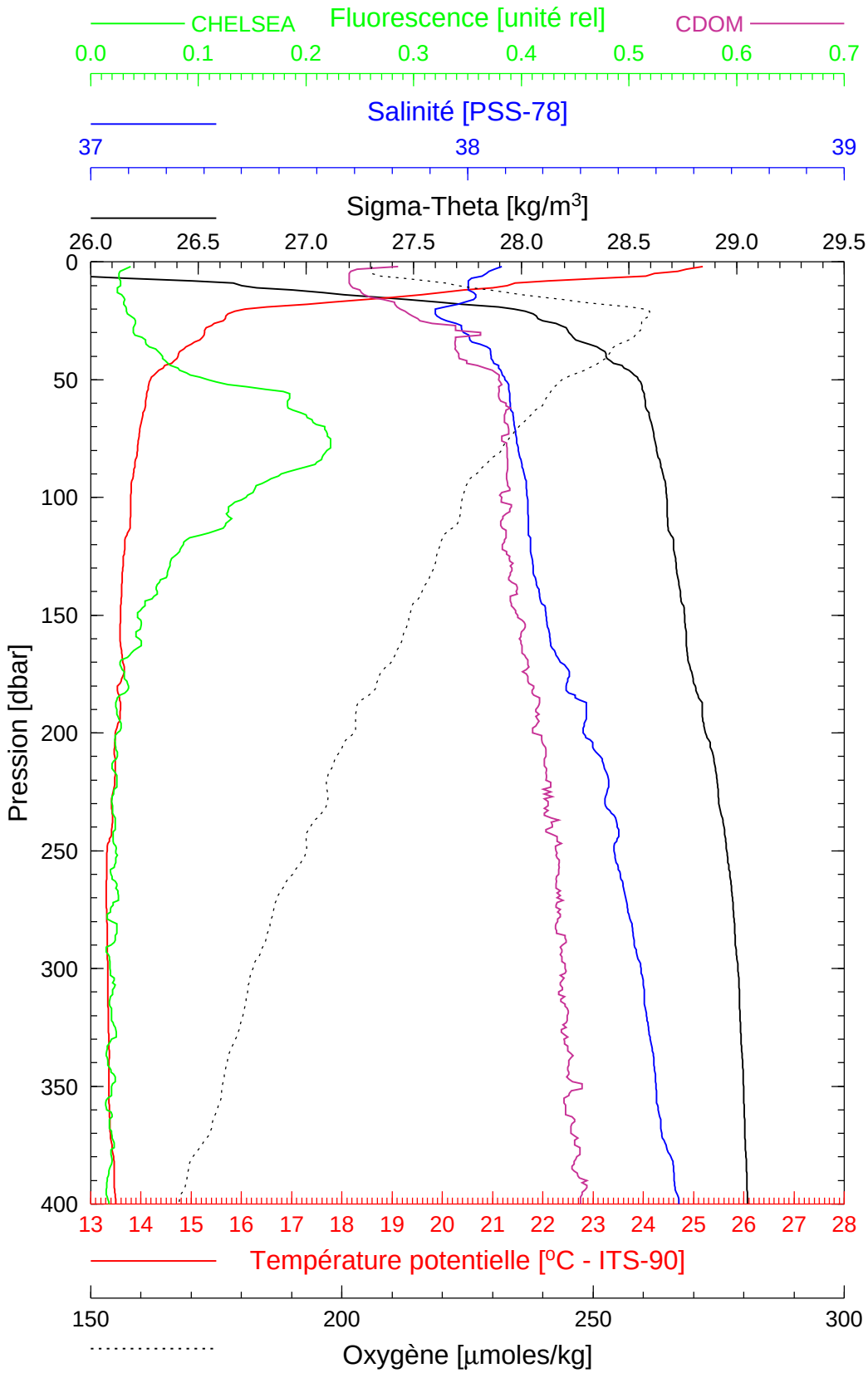
Date *14/07/2003* *Latitude* *43º31.001 N*
Heure déb *17h 09min [TU]* *Longitude* *07º37.015 E*

Boussole 24 **Juillet 2003** **bous009**



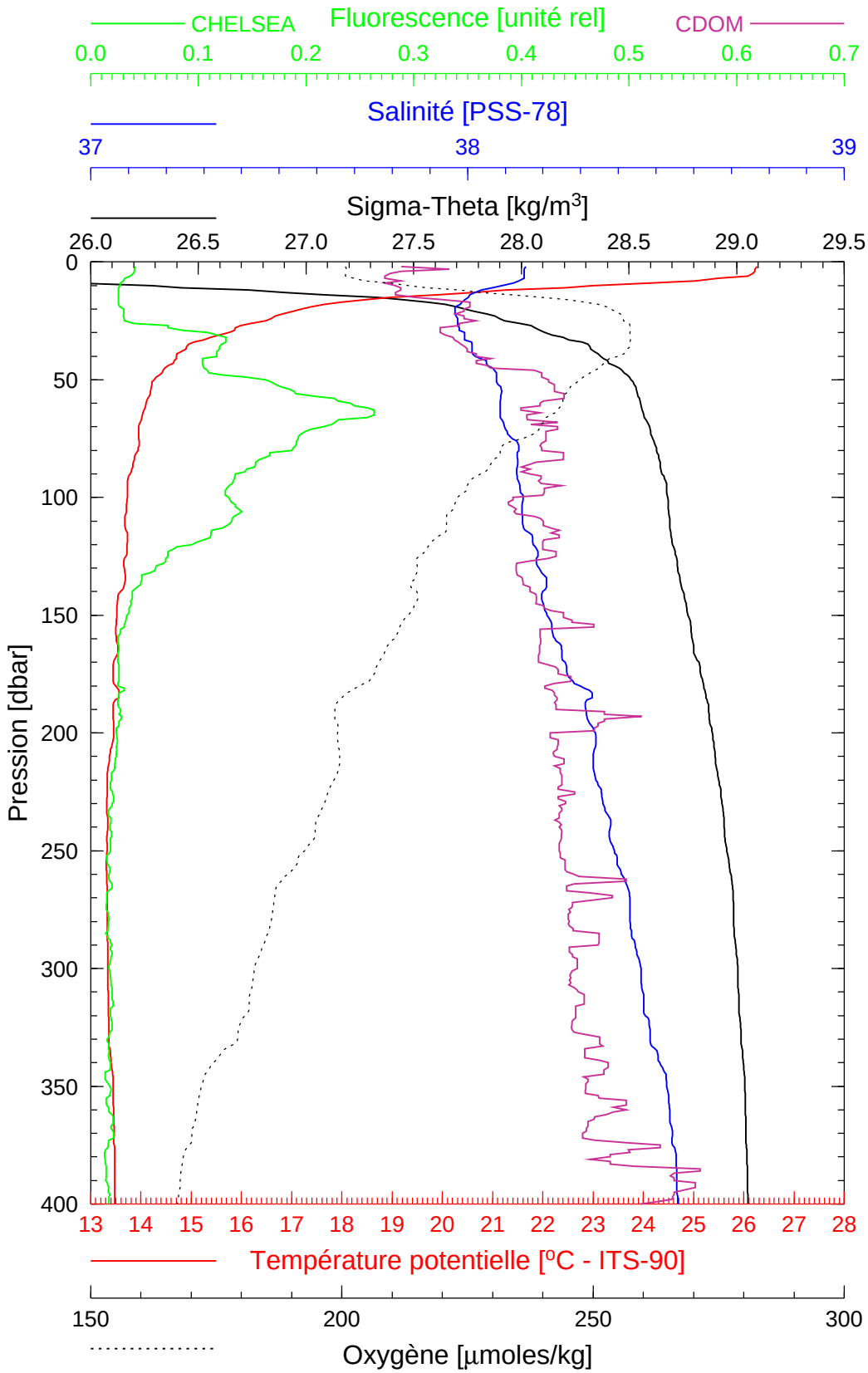
Date *14/07/2003* *Latitude* *43°33.953 N*
Heure déb *18h 11min [TU]* *Longitude* *07°31.100 E*

Boussole 24 **Juillet 2003** **bous010**



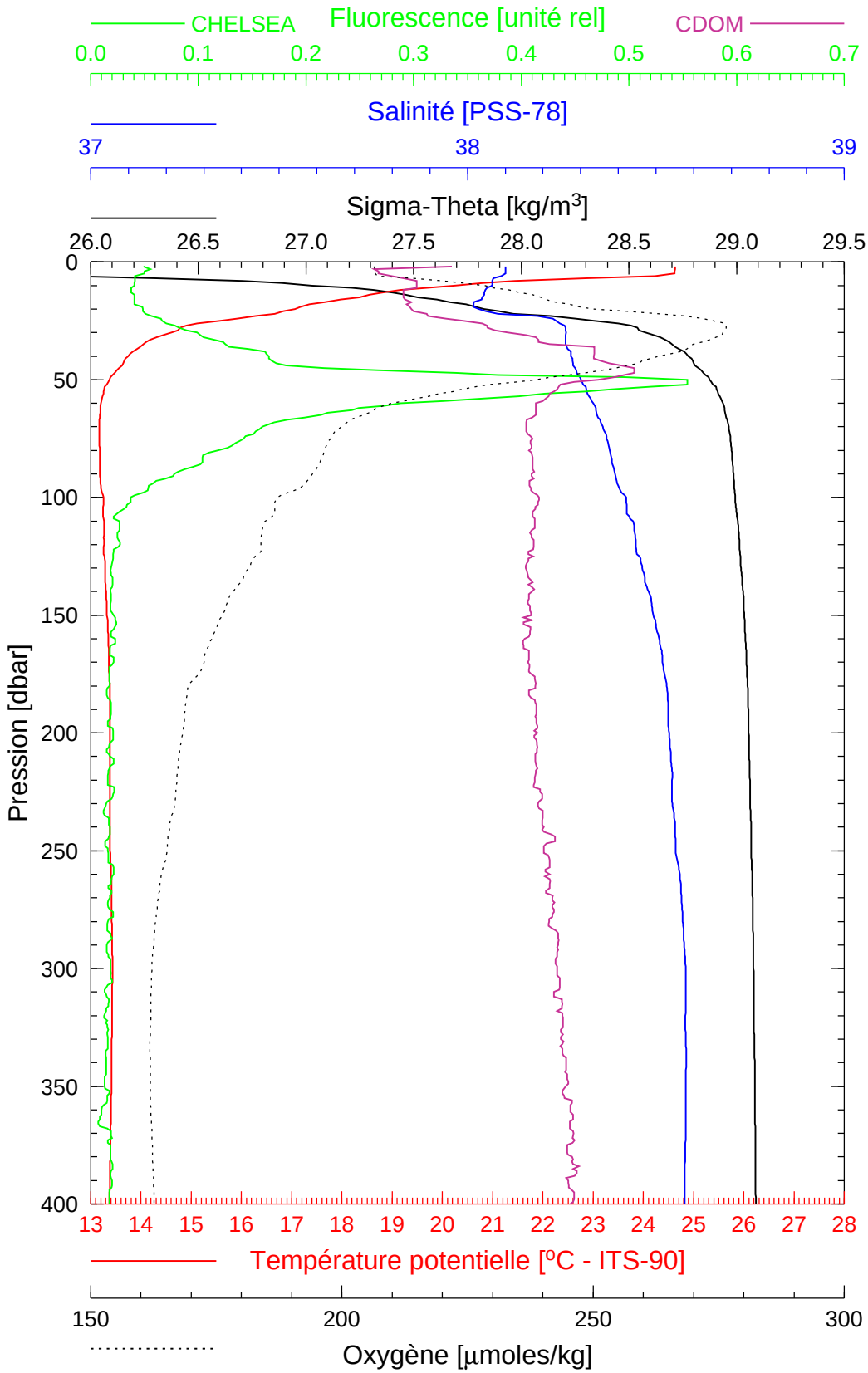
Date *14/07/2003* *Latitude* *43º37.496 N*
Heure déb *19h 12min [TU]* *Longitude* *07º25.046 E*

Boussole 24 **Juillet 2003** **bous011**



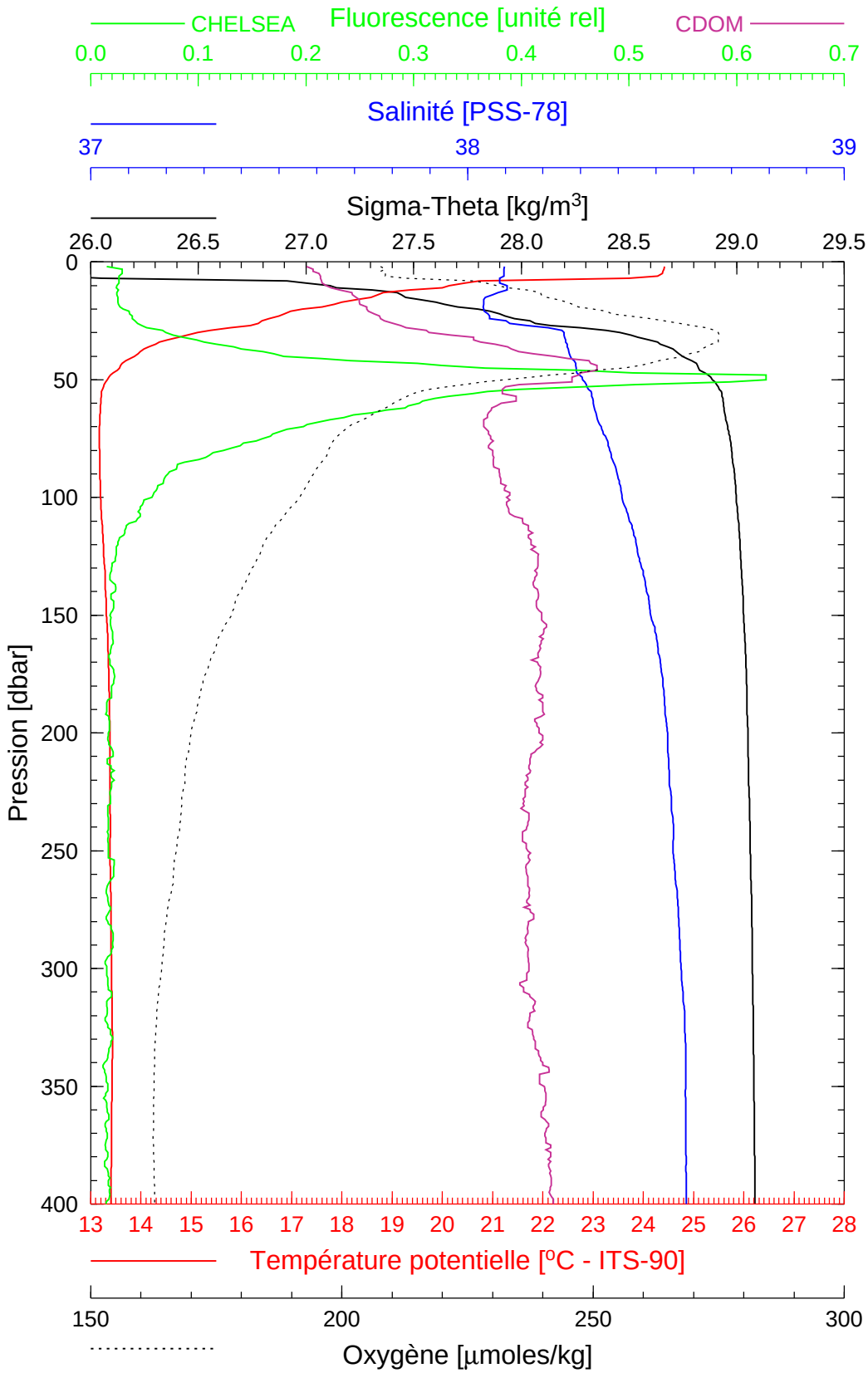
Date *14/07/2003* *Latitude* *43º39.330 N*
Heure déb *20h 02min [TU]* *Longitude* *07º21.358 E*

Boussole 24 **Juillet 2003** **bous012**



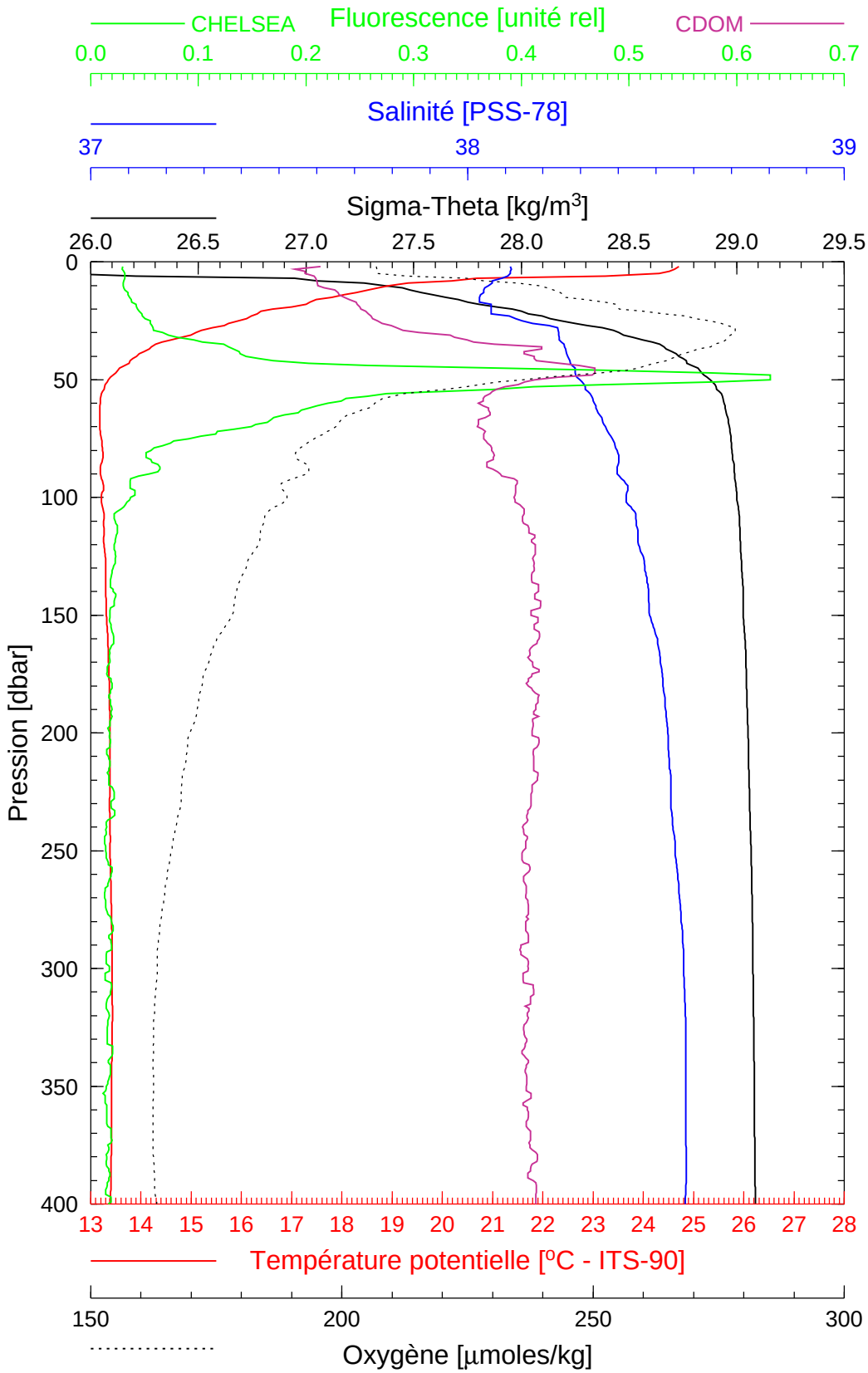
Date *15/07/2003* *Latitude* *43º22.102 N*
Heure déb *06h 22min [TU]* *Longitude* *07º53.752 E*

Boussole 24 **Juillet 2003** **bous013**



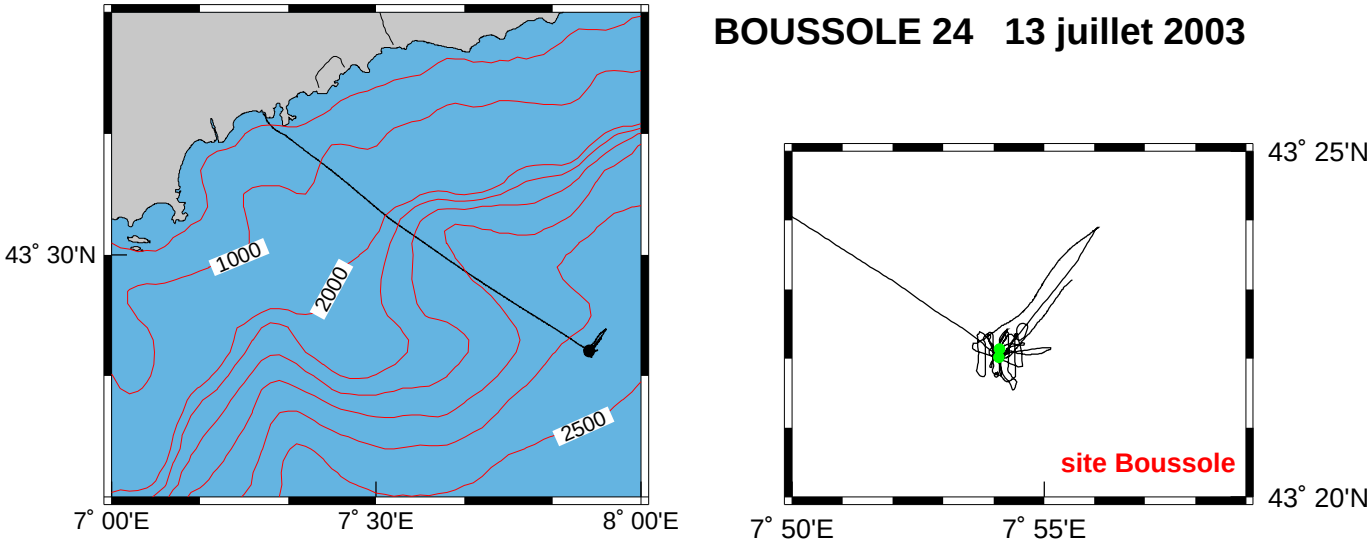
Date *15/07/2003* *Latitude* *43º22.080 N*
Heure déb *11h 14min [TU]* *Longitude* *07º53.971 E*

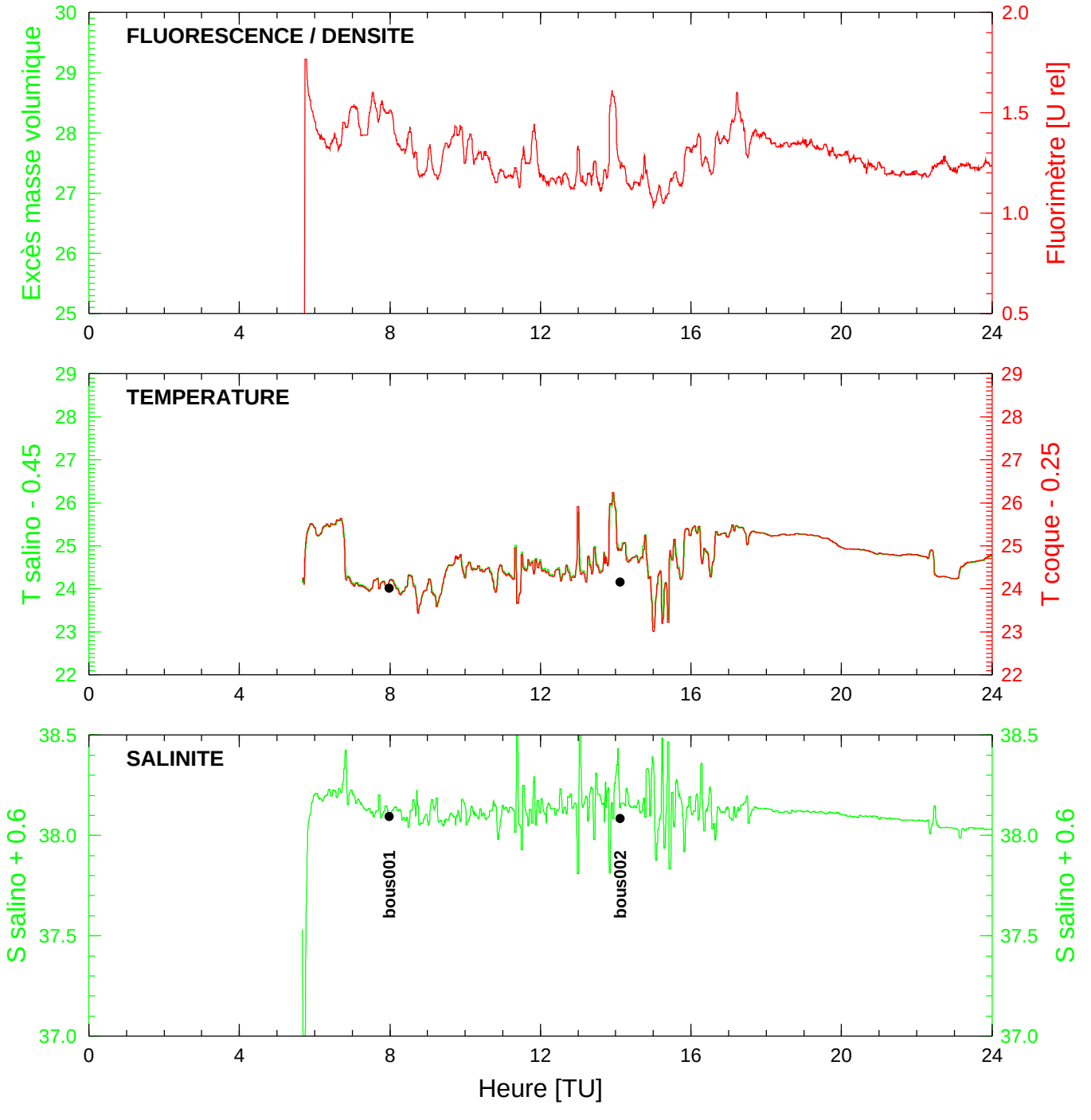
Boussole 24 **Juillet 2003** **bous014**



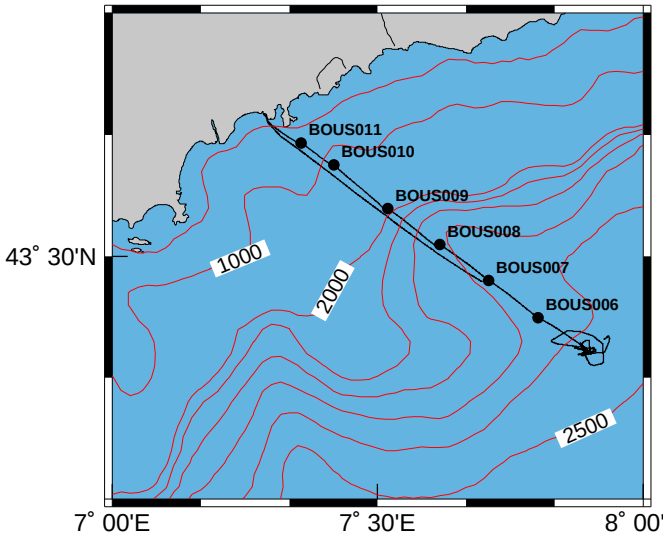
Date *15/07/2003* *Latitude* *43º22.064 N*
Heure déb *13h 53min [TU]* *Longitude* *07º54.053 E*

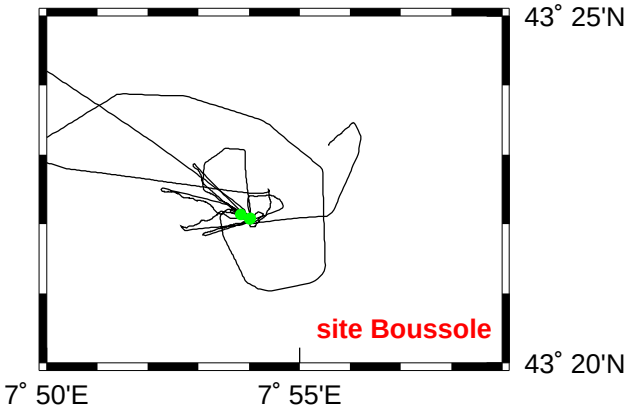
BOUSSOLE 24 13 juillet 2003

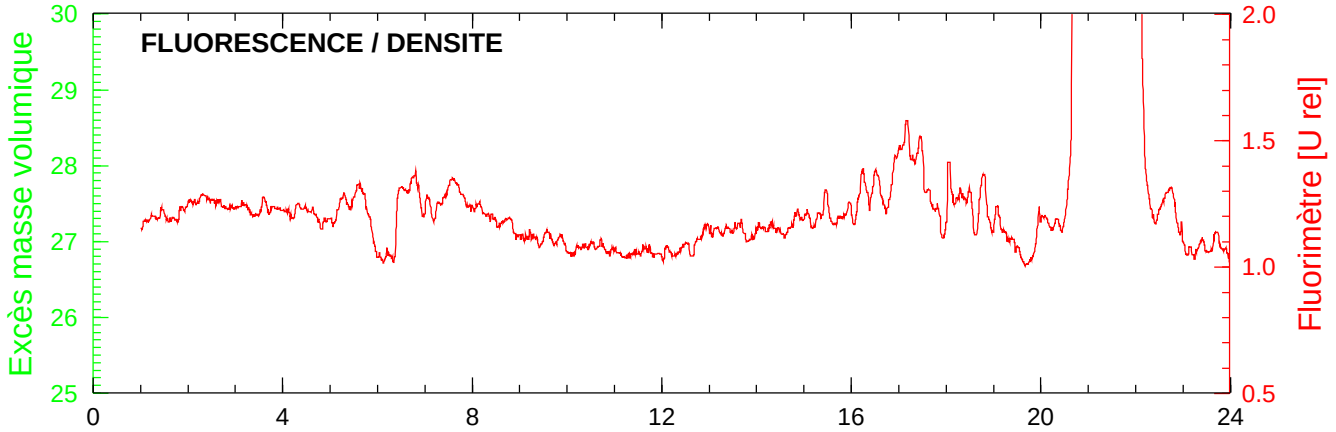


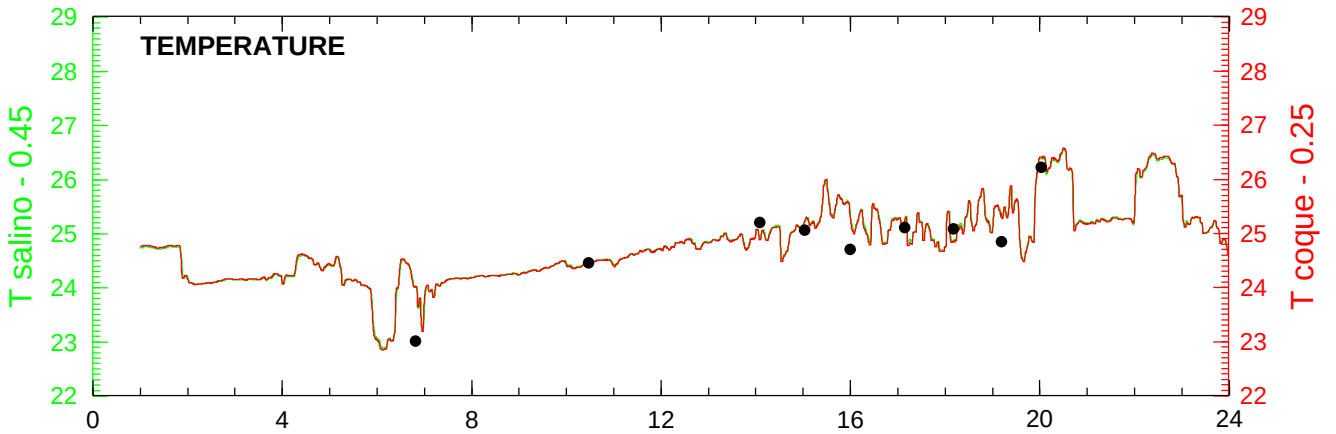


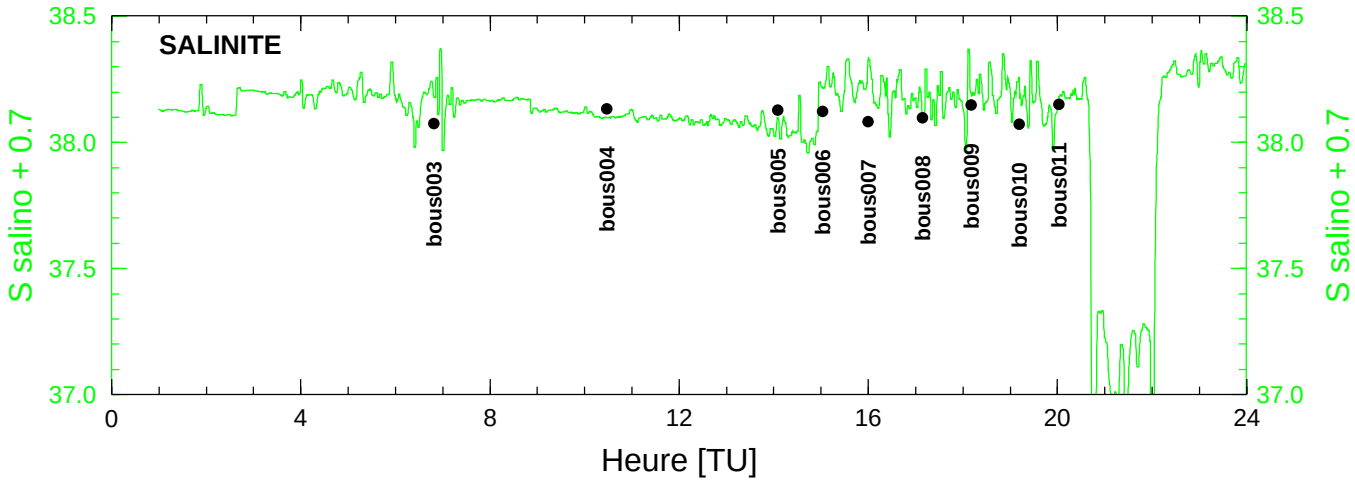
BOUSSOLE 24 14 juillet 2003

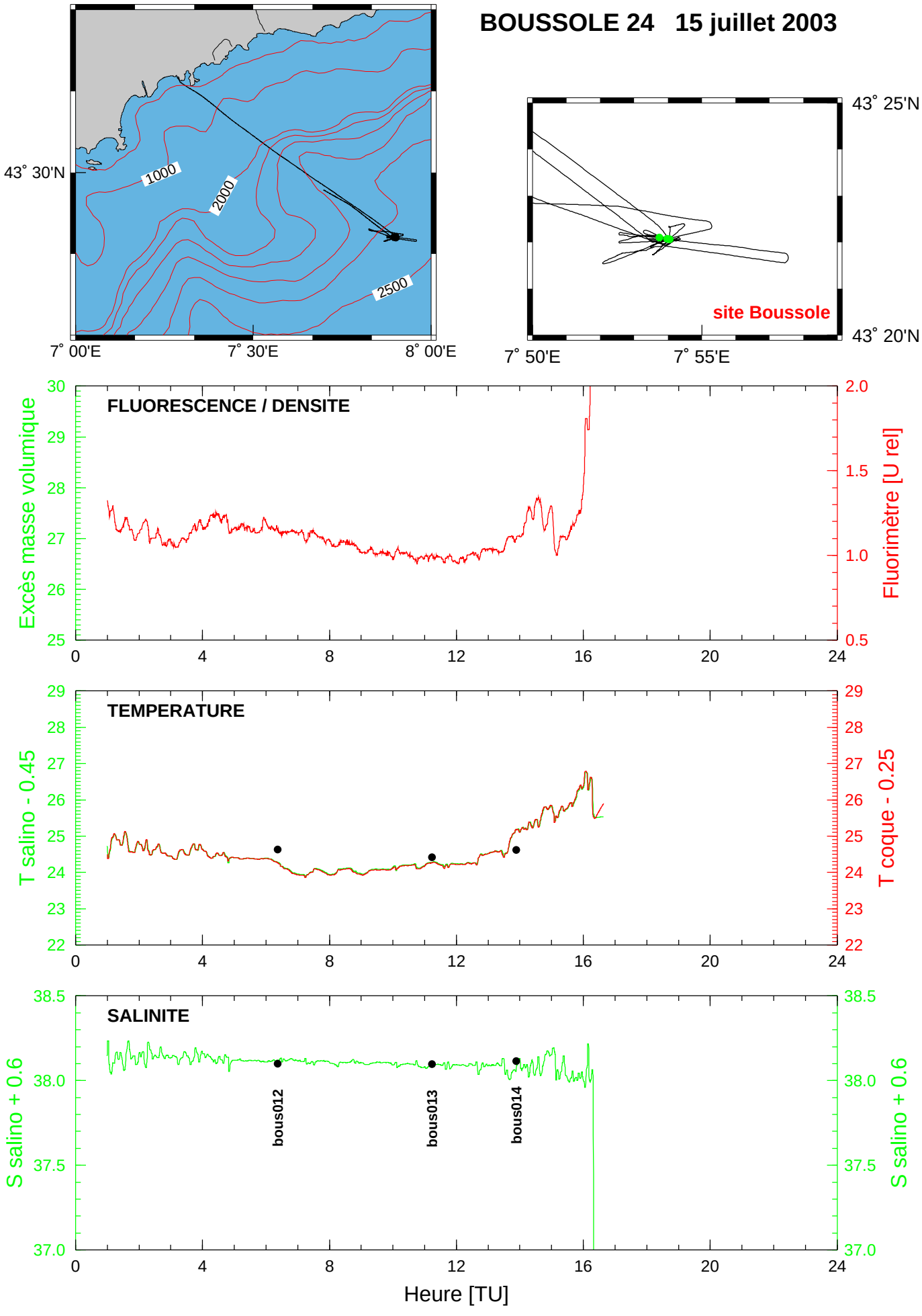











BOUSSOLE 24 15 juillet 2003
43° 30'N
1000
2000
2500
7° 00'E
7° 30'E
8° 00'E
43° 25'N
site Boussole
43° 20'N
7° 50'E
7° 55'E
FLUORESCENCE / DENSITE
Excès masse volumique
Fluorimètre [U rel]
TEMPERATURE
T salino - 0.45
T coque - 0.25
SALINITE
S salino + 0.6
bous012
bous013
bous014
Heure [TU]

Boussole 24 *13 juillet 2003* *Quadrillage*