BOUSSOLE Monthly Cruise Report

Cruise 34
July 05 – 07, 2004

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

Science Personnel: Alec Scott, Dominique Tailliez, Guislain Becu, Davey Merien, Marc Picheral, David Luquet, 2 divers

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

Fig 1. A typical scene at the buoy site where fishing boats trawl past as close to the buoy structure as possible.

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

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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 stored in LN2 for HPLC pigment and particule absorption spectrophotometric 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.

Additionally to Alec Scott and Dominique Tailliez, Davey Merien will be assisting Mr Tailliez with CTD operations in order to establish an efficient protocol for processing the data from the AC9. Guislain Becu, the newly recruited engineer for Boussole, will be participating on the cruise to be trained up on protocols so that he may eventually take over the responsibilities of Alec Scott

Three CNRS divers will be aboard to check on the physical state of the buoy below the surface, providing underwater photographs and cleaning the sensors. They will also bring to the surface the emergency Argos beacon so that it might be tested on deck by activation then cleaned up before being fixed back into position.

Other activities will also be performed on the buoy to download the data off the buoy and verify that everything is as expected above the waterline. The solar panel which was found damaged two weeks earlier will be disconnected from the buoy system to avoid the risk of electrical faults in the case that water penetrates into the circuitry.

Cruise Summary

Monday 5th July

Departure was later than the planned 07h30 because loading time and returning the boat trailer to Villefranche took longer than expected. Further delays were then caused by the Corsica ferry manoeuvring in port at the same time.

In the absence of any Argos communication for almost two weeks, it was a relief to find that the buoy was still there and seemingly normal. The diving operations were the first activity with the objectives of filming and photographing underwater, cleaning the optics sensors and finally removing the emergency argos beacon for on-deck testing. The operation was a success in all respects. No further problems with the buoy system were reported although it was confirmed that there was evidence of a heavy impact on one of the main vertical tubes at around the 4m depth. The 4m arm was reported as missing but this is the same arm that was removed by Alec Scott three weeks ago during a mission on the Sailing Vessel Sacanagem.

Three profiles with the SPMR and one for the CTD were performed for matchups with Modis and SeaWiFS overhead passes at 1013 and 1239, respectively. The divers went back to the buoy to replace the argos beacon and continue with the photography. Once completed, Alec Scott and Guislain Becu climbed on the buoy to download the data. This was successful although the test of the buoy to take the weight of two people proved that one person is the limit.. A broken solar panel discovered 2 weeks earlier was disconnected and dummy-plugged.

Two SPMR profiles were performed down to 150m followed by a CTD profile before the ship departed for Nice.

The conditions for the day were very hot and humid with clear but milky skies and very calm seas.

Mardi 6 juillet
Despite a punctual departure, arrival at the Boussole site was slightly delayed because of a mechanical problem with the ship during transit. However, conditions were very good with a clear sky that was slightly bluer than that of the previous day. The sea was once again very calm.

After the CTD profile, there was time for 2 SPMR profiles, one using the surface float and all optimising on the ideal conditions and a Meris pass. After the break for lunch, the sky was partly cloudy making the timing of profiling critical to avoid disturbances in the light field. Using the surface float, some high quality profiles were achieved.

Mercredi 7 juillet
The weather conditions were overcast with wind blowing 12 to 15 knots. After the dark measure of the radiometers, the deckbox unit was found with a short warning light indicated in the reference. After restarting deckbox, the profiler side indicated an open fault but no short was indicated. After several repetition tests, both instruments worked okay if the other was disconnected. Once both instruments were connected, the profiler showed open fault and both telemetry and frame sync green LEDs lit continuously.

The CTD had a data overflow problem which was corrected by Mr Tailliez but the ISUS nitrate sensor and AC9 were not able to be used. In addition, the underwater video recorder of Mark Picheral had technical problems so was unable to be tested as planned. Due to excessive biofouling on the flow system of the thermosalinograph causing problems with the pump, this data was not collected during the final day.

Numerous fishing boats were seen passing within a few meters of the buoy on each of the three days. A high abundance of fish was also seen in the region, including bonita. Long finned pilot whales were observed during the transit back to Nice on the second day.

Cruise Report

5th July, 2004 (Times UTC)

0605 Depart port of Nice
0935 Arrival at Boussole Site (43°22'N 7°54'E).
0950 Divers in water
1055 Divers back on deck
1125 SPMR in water
1210 SPMR on deck (3 profiles + Meris 1013 + SeaWiFS 1239)
1227 CTD Boussole 1. Max 400m. Bottle depths (m): 200,100,70,60,50,40,30,20,10, 5.
1257 CTD on deck
1255 Divers in water
1330 Divers on deck
1331 SPMR in water
1345 SPMR on deck (2 profiles)
1445 Alec on buoy to recuperate data
1559 CTD Boussole 2. Max 400m. Bottle depths (m): 10, 5
1625 CTD on deck
1630 Depart for Port of Nice
1940 Arrival in Port of Nice

6th July, 2004

0430 Depart port of Nice
0830 Arrival at Boussole Site (43°22'N 7°54'E).
0905 CTD Boussole 3. Max 400m. Bottle depths (m): 200,100,70,60,50,40,30,20,10, 5.
0905 CTD on deck
0915 SPMR in water
0925 SPMR on deck (1 profile + Meris 0941)

0940 SPMR float in water
0958 SPMR on deck deck (1 profile + Meris 0941)
1205 SPMR float in water
1302 SPMR on deck deck (5 profiles + SeaWiFS 1143)
1330 Start of quadrilateral
1430 End of quadrilateral.
1437 CTD Boussole 4. Max 400m. Bottle depths (m): 10, 5.
1539 CTD Boussole 5. Max 400m. Transect Station 1 (43°25'N 7°28'E).
1641 CTD Boussole 6. Max 400m. Transect Station 2 (43°28'N 7°42'E).
1806 CTD Boussole 7. Max 400m. Transect Station 3 (43°31'N 7°37'E).
1921 CTD Boussole 8. Max 400m. Transect Station 4 (43°34'N 7°31'E).
2028 CTD Boussole 9. Max 400m. Transect Station 5 (43°37'N 7°25'E).
2115 Arrival in port of Nice

7th July, 2004

0430 Depart port of Nice
0745 Arrival at Boussole Site (43°22'N 7°54'E).
0848 CTD Boussole 10. Max 400m. NEED TO CONFIRM WITH DOMINIQUE.
0917 CTD on deck
0920 SPMR session experienced electronic faults.
0930 Underwater video recorder test in water for testing
1000 UVR back on deck – test failed.
1130 SPMR tested but failed
1145 UVR tested but failed
1345 TO CONFIRM WITH DOMINIQUE
1350 Depart for Nice
1715 Arrival in port of Nice

Boussole Site Satellite Overhead Pass Schedules

SeaWiFS: Viewing Times

Date Time (UTC)	Lat (DEG)	Lon (DEG)	Sat. Azi.	Sat. Elev.	Range (km)	Sun Azi.	Sun Elev.	Tilt	Flags*
05 Jul 2004 12:39:44	43.220	7.540	251.44	54.57	839	218.58	65.46	AFT	2
06 Jul 2004 11:42:27	43.220	7.540	116.67	34.52	1127	185.11	69.35	AFT	2
06 Jul 2004 13:19:53	43.220	7.540	279.71	24.35	1413	235.00	60.05	AFT	2 3
07 Jul 2004 12:22:46	43.220	7.540	198.59	67.96	749	209.46	67.04	AFT	2

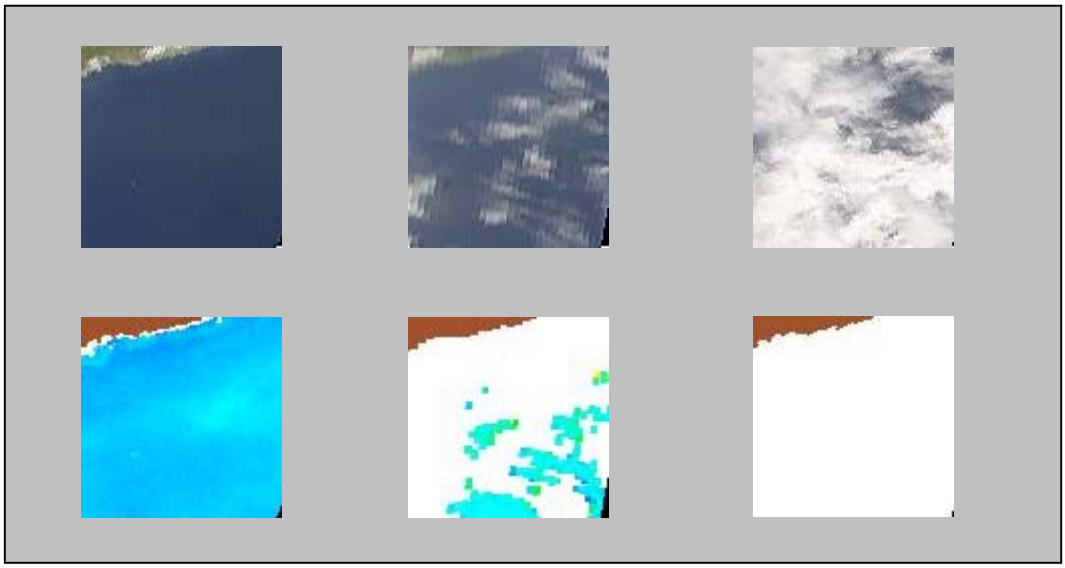
MERIS: Viewing Times

Date Time (UTC)	Lat (DEG)	Lon (DEG)	Sat. Azi.	Sat. Elev.	Range (km)	Sun Azi.	Sun Elev.	Tilt	Flags*
05 Jul 2004 10:13:07	43.220	7.540	287.46	73.04	822	134.10	63.50	NADIR	4
06 Jul 2004 09:41:52	43.220	7.540	100.52	59.29	902	122.39	58.92	NADIR	

Ligurian Sea Boussole Site Satellite Images

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

SeaWiFS



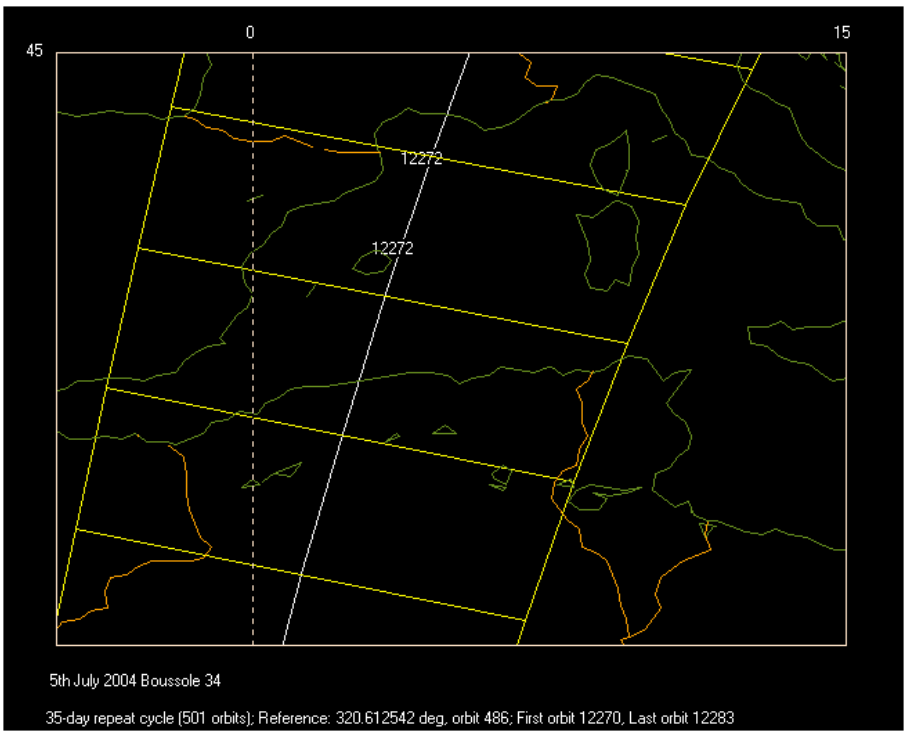
5th July 2004 6th July 2004 7th July 2004

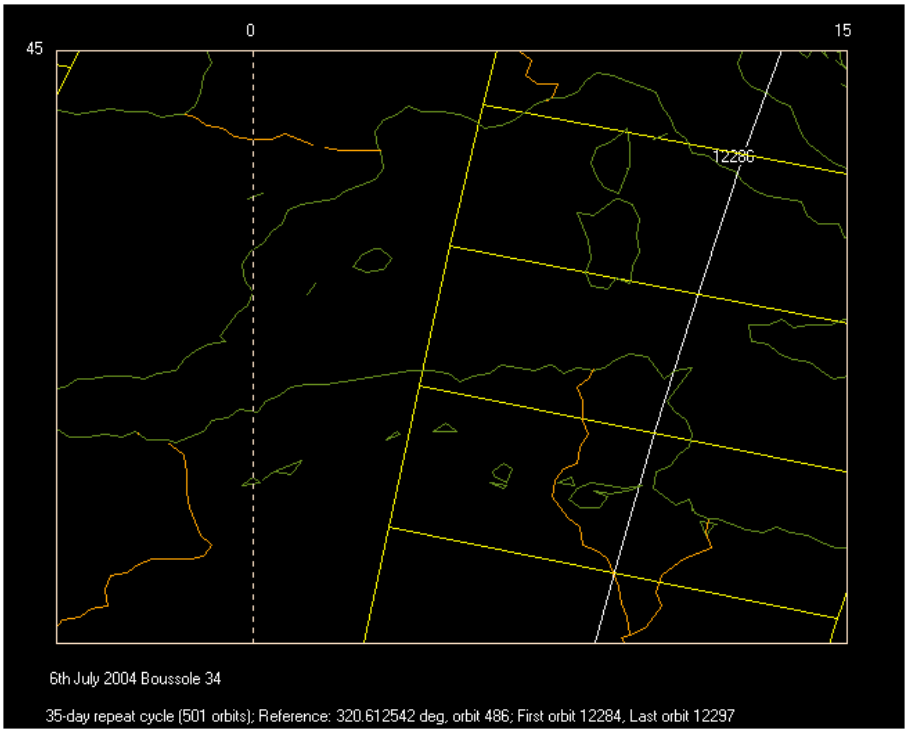
Figure 2. SeaWiFS images Level 1 hdf (upper) and Level 2 hdf (lower) images of the french coastline and Boussole site. (http://seawifs.gsfc.nasa.gov/cgi/seawifs_region_extracts)

Modis

Modis images not available at time of last edit

Calculated Swath paths for Modis Sensor (ESOV Software)

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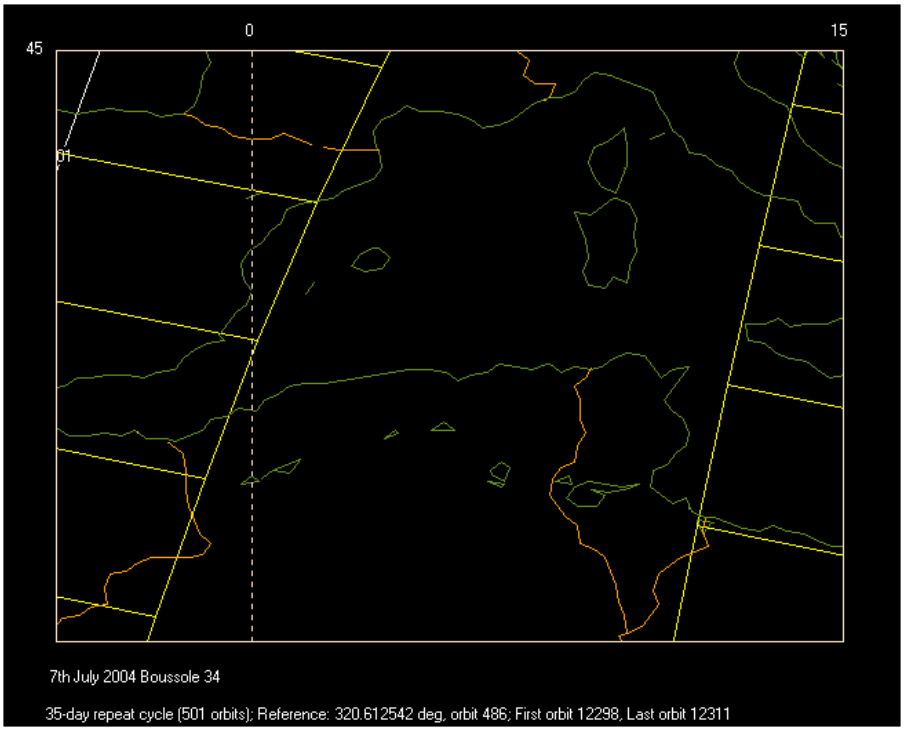
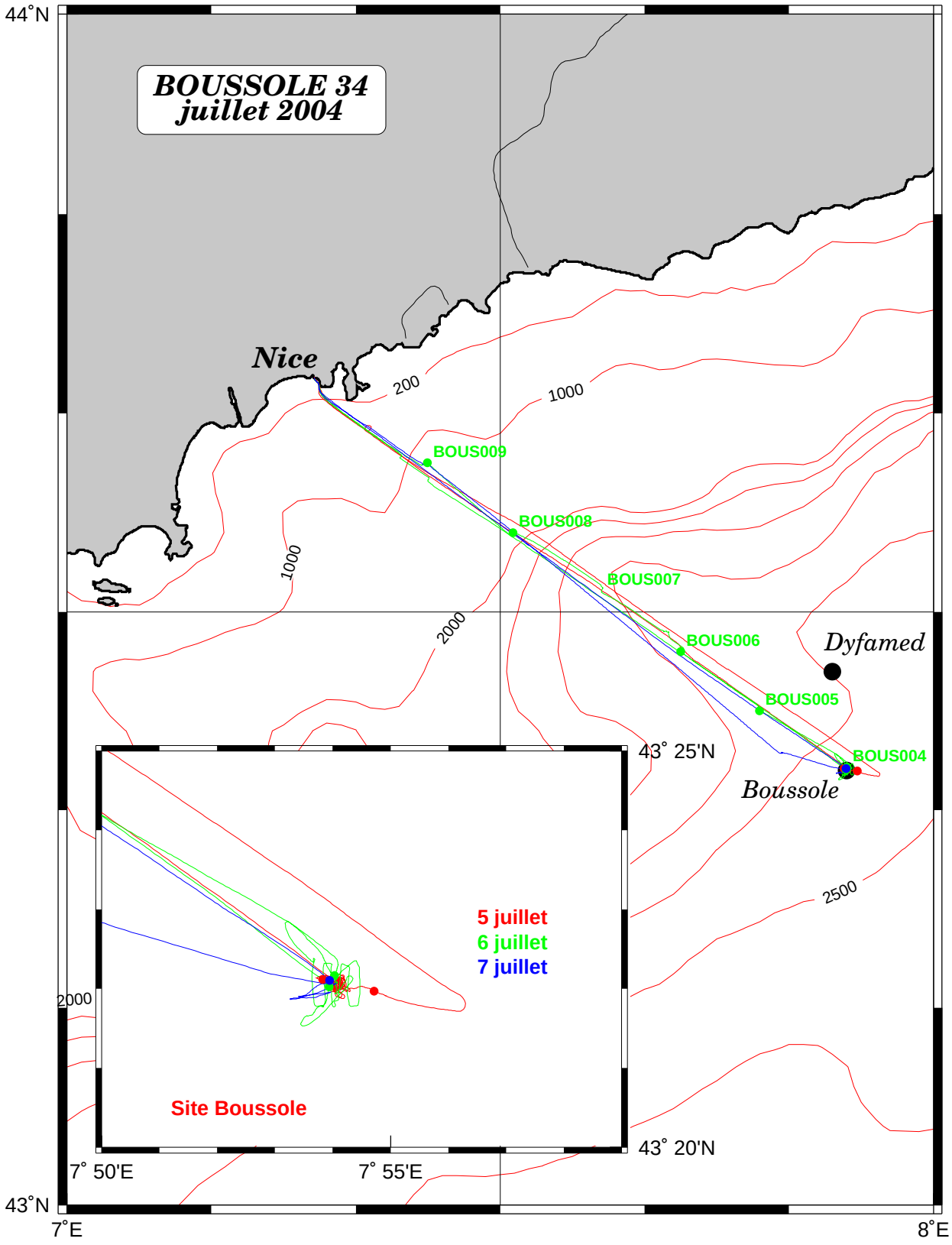
15
45
12286
6th July 2004 Boussole 34
35-day repeat cycle (501 orbits); Reference: 320.612542 deg, orbit 486; First orbit 12284, Last orbit 12297


0
15
45
01
7th July 2004 Boussole 34
35-day repeat cycle (501 orbits); Reference: 320.612542 deg, orbit 486; First orbit 12298, Last orbit 12311

Cruise Summary Table for Boussole 34

Date	Black names	Profile names	CTD notées /	Start Time	Duration	Depth max	Latitude (N)		50		Other sensors	Their cast	Start/Finish			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 speed	Wind dir.	Atm. Pressure	humidity	Visibility	T air	T water	Sea	Swell height	Swell dir.	White horses
05/07/04																											
	bou050704black1			11:04	03:00																						
		bou050704A		11:31	04:35	220	43	22.049	7	53.979				Milky	-	0	2	197	1020	72	good	23.9			0		no
		bou050704B		11:42	04:16	200	43	22.155	7	53.953				Milky	-	0	2	197	1020	72	good	23.9			0		no
		bou050704C		11:51	04:18	200	43	22.167	7	53.881				Milky	-	0	2	197	1020	72	good	23.9			0		no
	bou050704black2			12:14	03:00																						
			CTDBOUS001	12:27	30:00	400	43	22.117	7	53.823						0	2	46	1019.5	72		23.9	23.13	calm			
		bou050704D		15:31	03:17	150	43	22.007	7	54.333				Milky	cirrus	3	7	49	1018.7	72	good	23.8		calm	0	0	no
		bou050704E		15:41	03:26	158	43	22.032	7	54.496																	
			CTDBOUS002	15:59	26:00	400	43	21.972	7	54.713						3	8	58	1018.7	71		23.7		calm			
	bou050704black3			16:00	03:00																						
06/07/04			CTDBOUS003	08:33	31:00	400	43	22.028	7	53.934						0	2	245	1017.4	77		23.2	22.52	calm			
	bou060704black1																										
		bou060704A		09:17	03:00	200	43	21.652	7	53.529				slightly milky	fine cirrus	<1	3	268	1017.5	70	good	25		calm	0	0	no
		bou060704spmratsurface1		09:47	07:21	200	43	22.022	7	54.153				slightly milky	fine cirrus	<1	3	268	1017.5	70	good	25		calm	0	0	no
	bou060704black2			10:02	03:00																						
	bou060704black3			11:58	03:00																						
		bou060704spmratsurface2		12:13	07:07	200	43	22.276	7	53.308				milky	cirrus	3	5	264	1016.8	71	good	22.8		calm	0	0	no
		bou060704spmratsurface3		12:25	04:44	105	43	22.314	7	53.89				milky	cirrus	3	5	264	1016.8	71	good	22.8		calm	0	0	no
		bou060704spmratsurface4		12:36		200	43	22.486	7	53.762				milky	cirrus	3	5	264	1016.8	71	good	22.8		calm	0	0	no
		bou060704spmratsurface5		12:53	06:24	200	43	22.634	7	53.553				milky	cirrus	3	5	264	1016.8	71	good	22.8		calm	0	0	no
	bou060704black4			13:20	03:00																						
			Quadrilateral001	13:30		5	43	22.361	7	53.665																	
			Quadrilateral002	13:54		5	43	21.805	7	54.044																	
			Quadrilateral003	14:14		5	43	22.336	7	54.416																	
			CTDBOUS004	14:37	25:00	400	43	22.17	7	54.034						2	3	161	1015.9	71		24.2	23.75	calm			
			CTDBOUS005	15:39	29:00	400	43	25.032	7	47.94																	
			CTDBOUS006	16:41	26:00	400	43	27.995	7	42.504																	
			CTDBOUS007	18:06	26:00	400	43	31.084	7	37.009																	
			CTDBOUS008	19:21	31:00	400	43	33.99	7	30.872				cloudy	cumulus	8	3	72	1013	82	fair	20			0	-	no
			CTDBOUS009	20:28	27:00	400	43	37.517	7	24.948				cloudy	cumulus	8	3	72	1013	82	fair	20			0	-	no
07/07/04			CTDBOUS010	08:48	29:00	400	43	22.109	7	53.945						4	9	55	1015.4	79		23.2	22.65	choppy			



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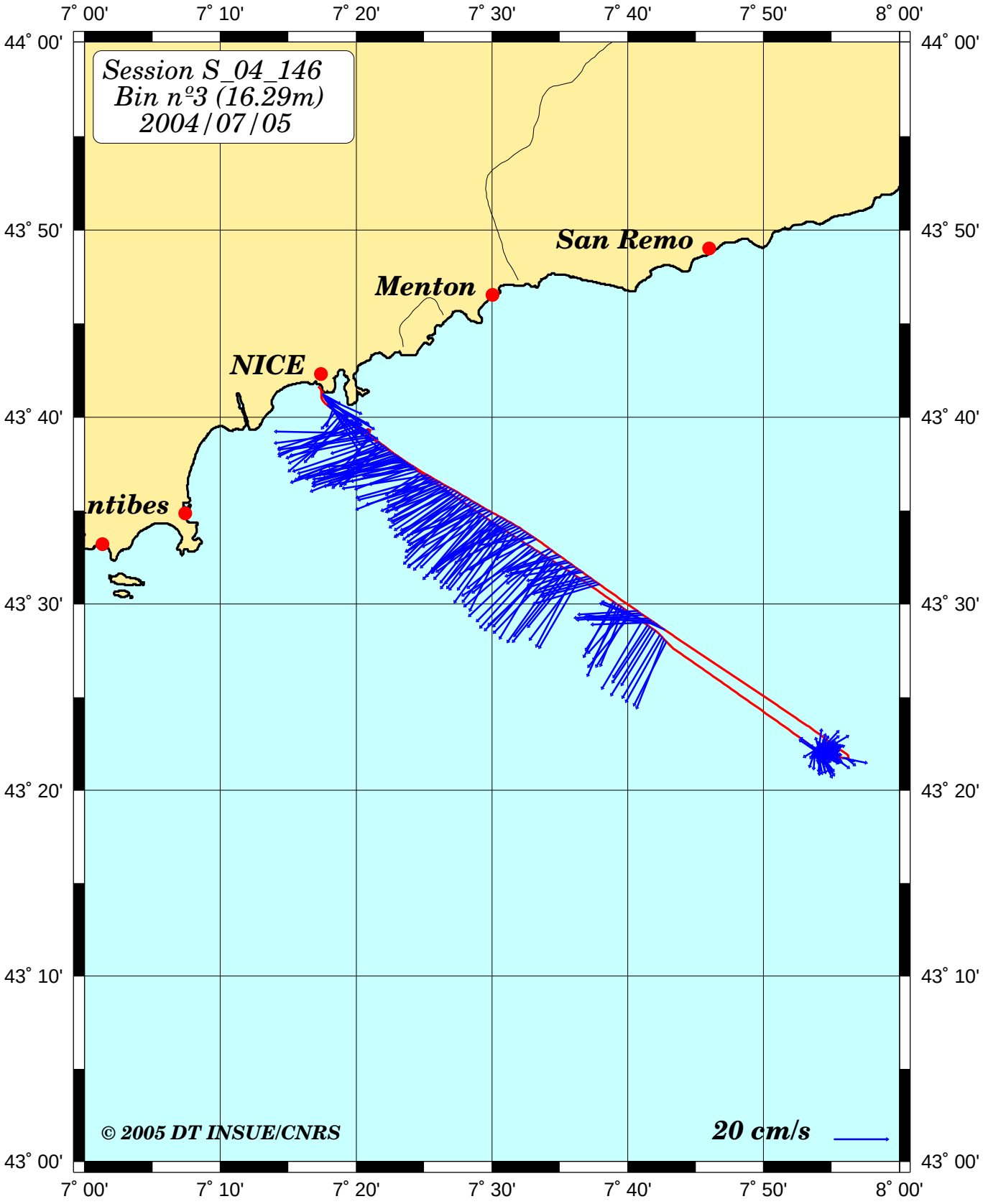

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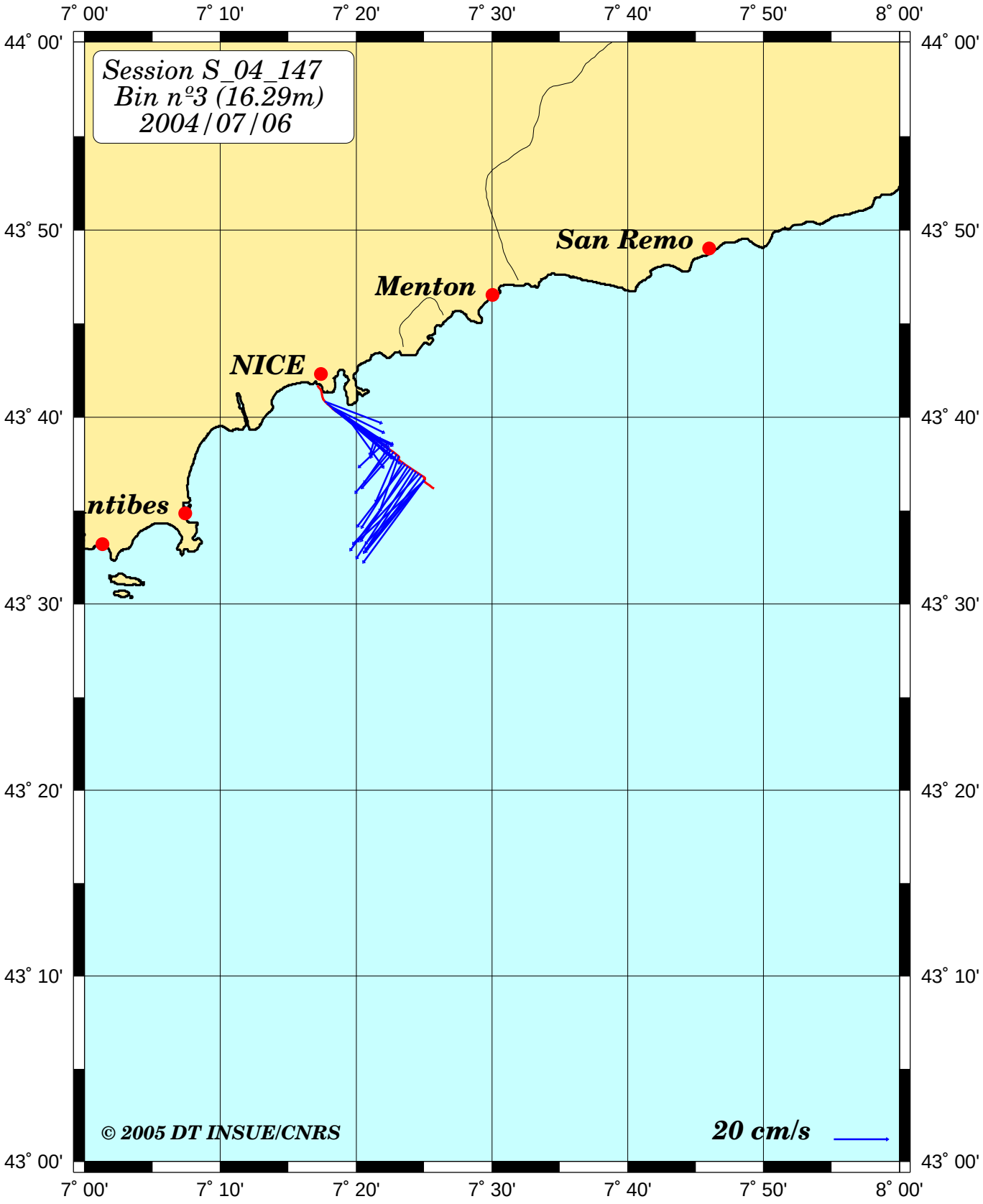

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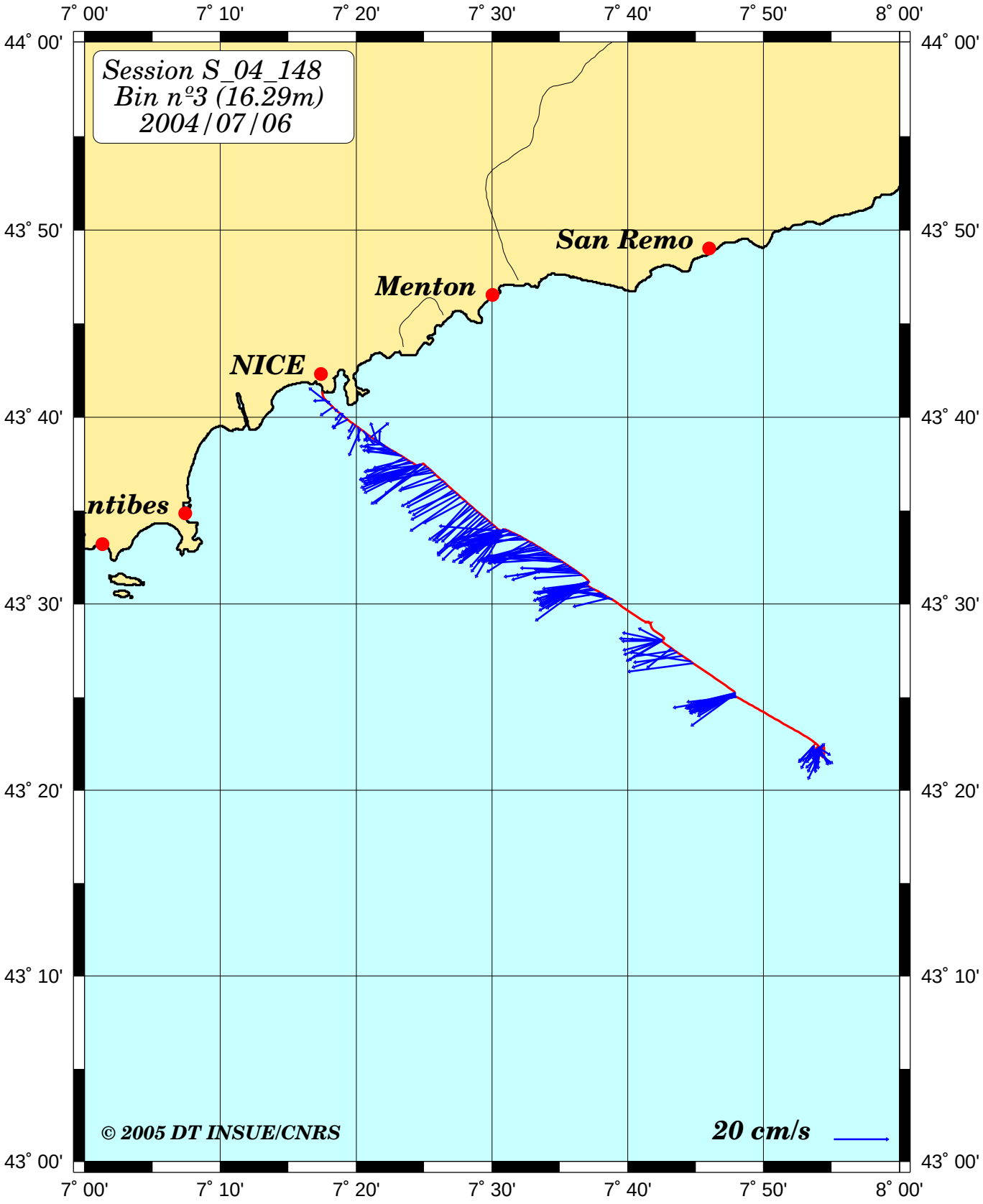

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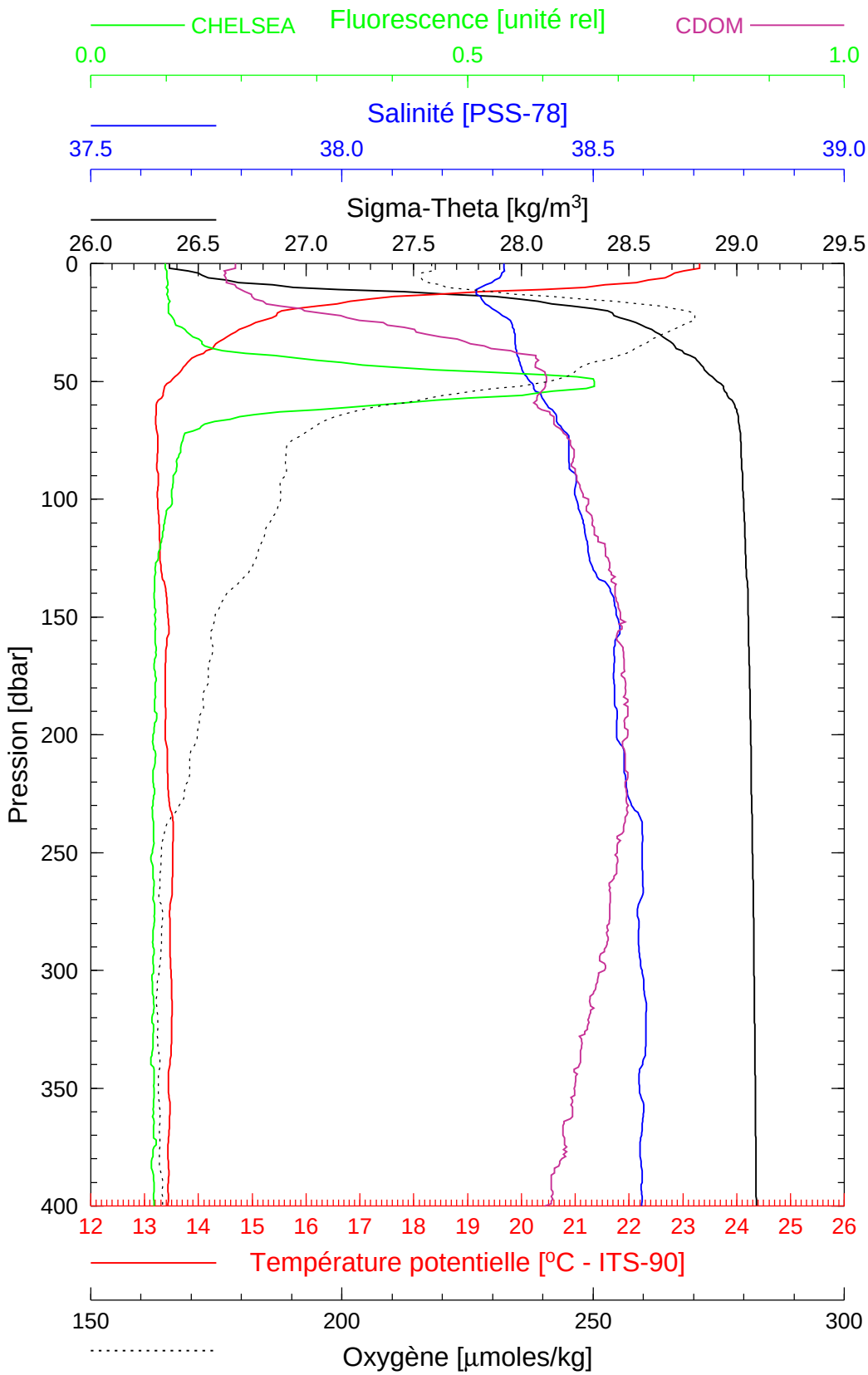
Boussole 34 **05/07/2004** **BOUS040705_01**

BOUS001

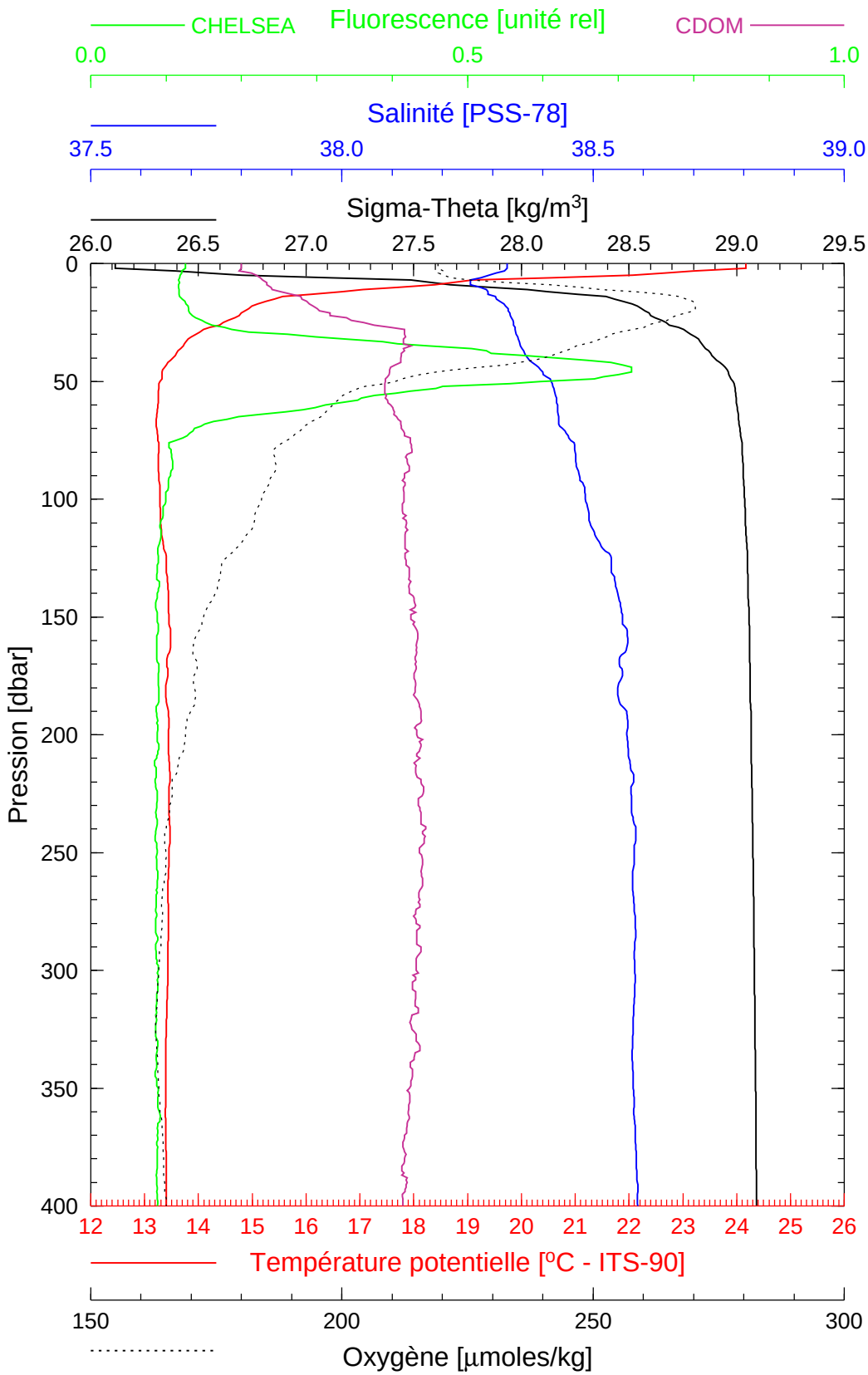


Date *05/07/2004* *Latitude* *43º22.117 N*

Heure déb *12h 27min [TU]* *Longitude* *07º53.823 E*

Boussole 34 **05/07/2004** **BOUS040705_02**

BOUS002

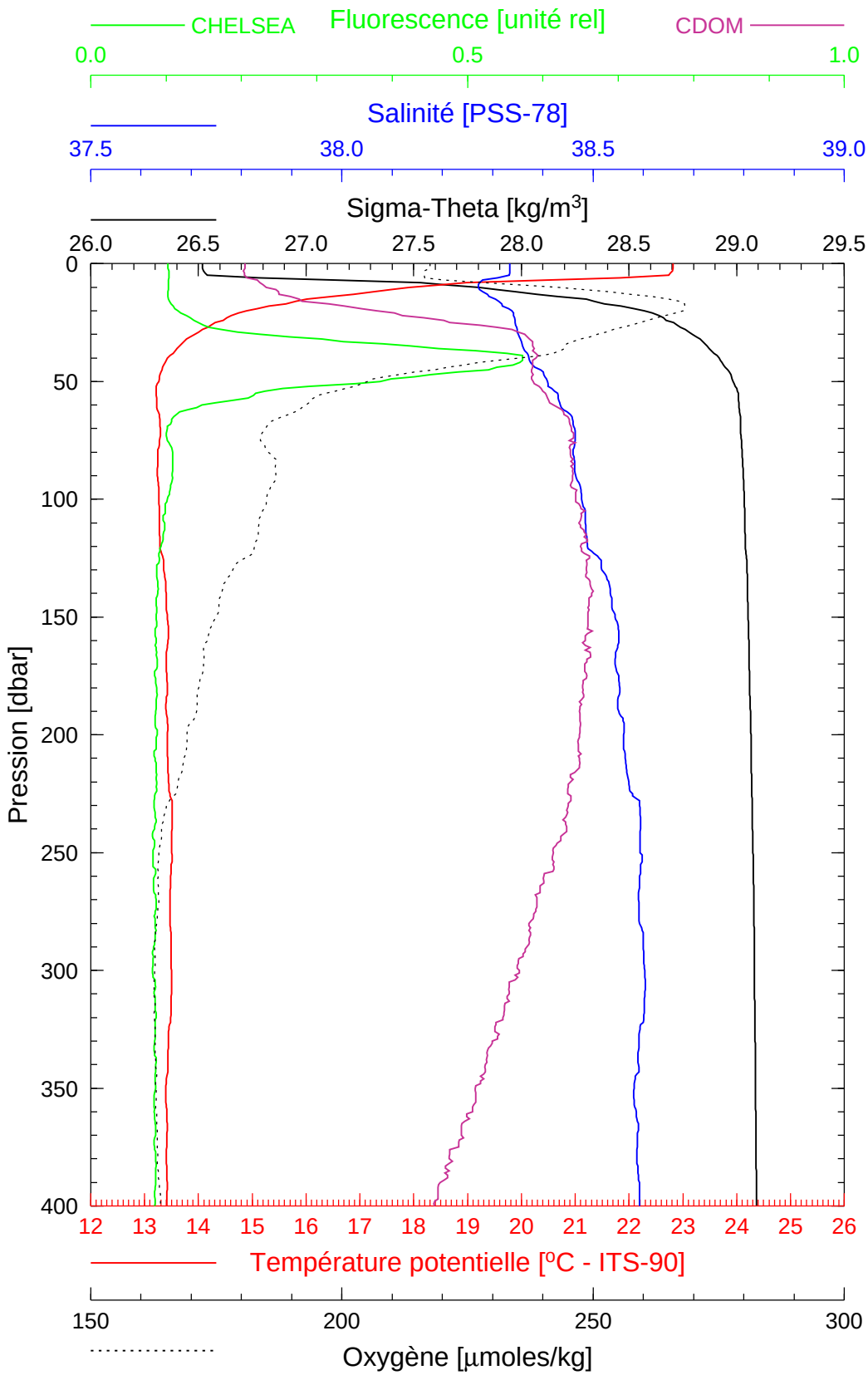


Date *05/07/2004* *Latitude* *43º21.972 N*

Heure déb *15h 59min [TU]* *Longitude* *07º54.972 E*

Boussole 34 **06/07/2004** **BOUS040706_01**

BOUS003

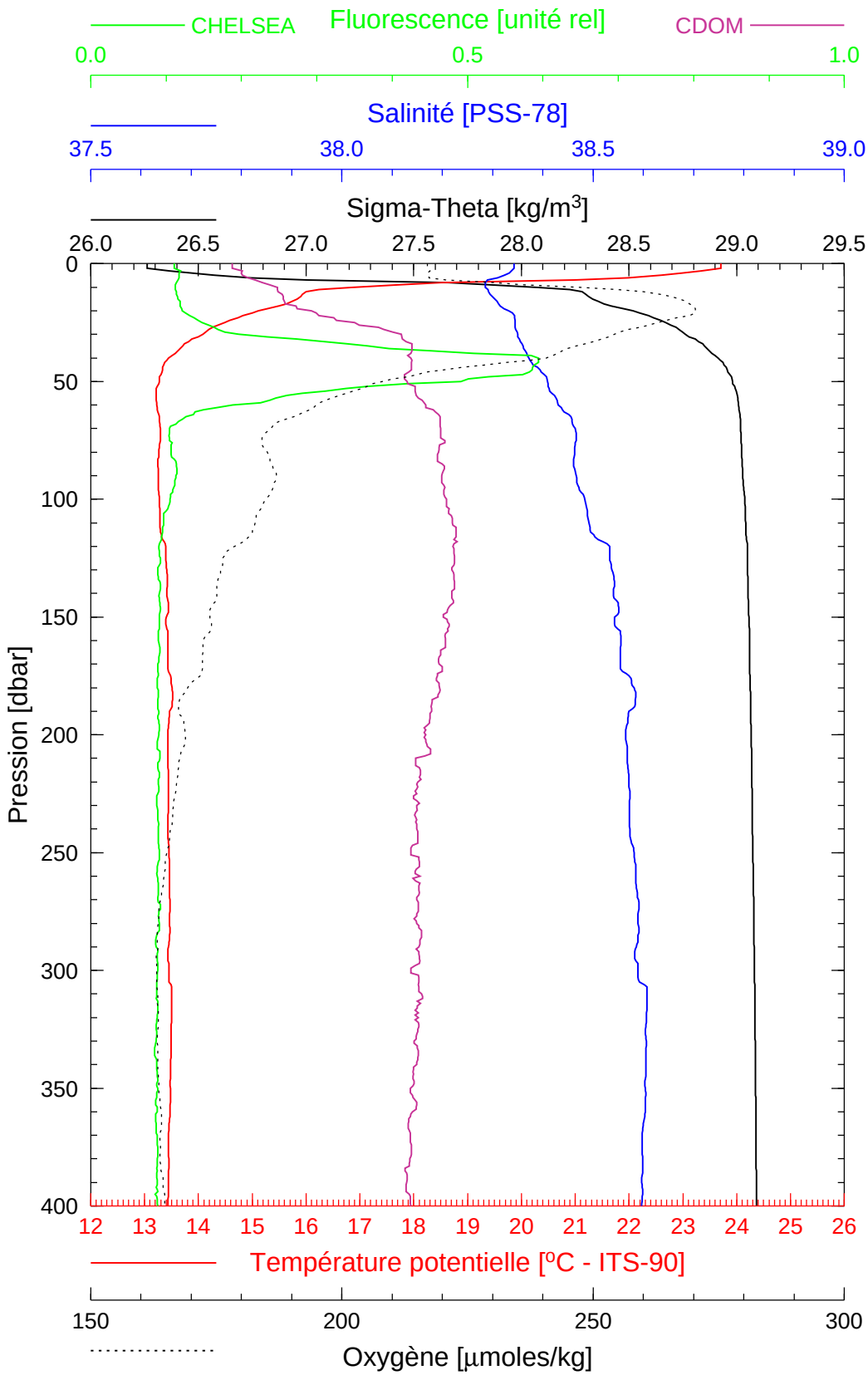


Date *06/07/2004* *Latitude* *43º22.028 N*

Heure déb *08h 33min [TU]* *Longitude* *07º53.934 E*

Boussole 34 **06/07/2004** **BOUS040706_02**

BOUS004

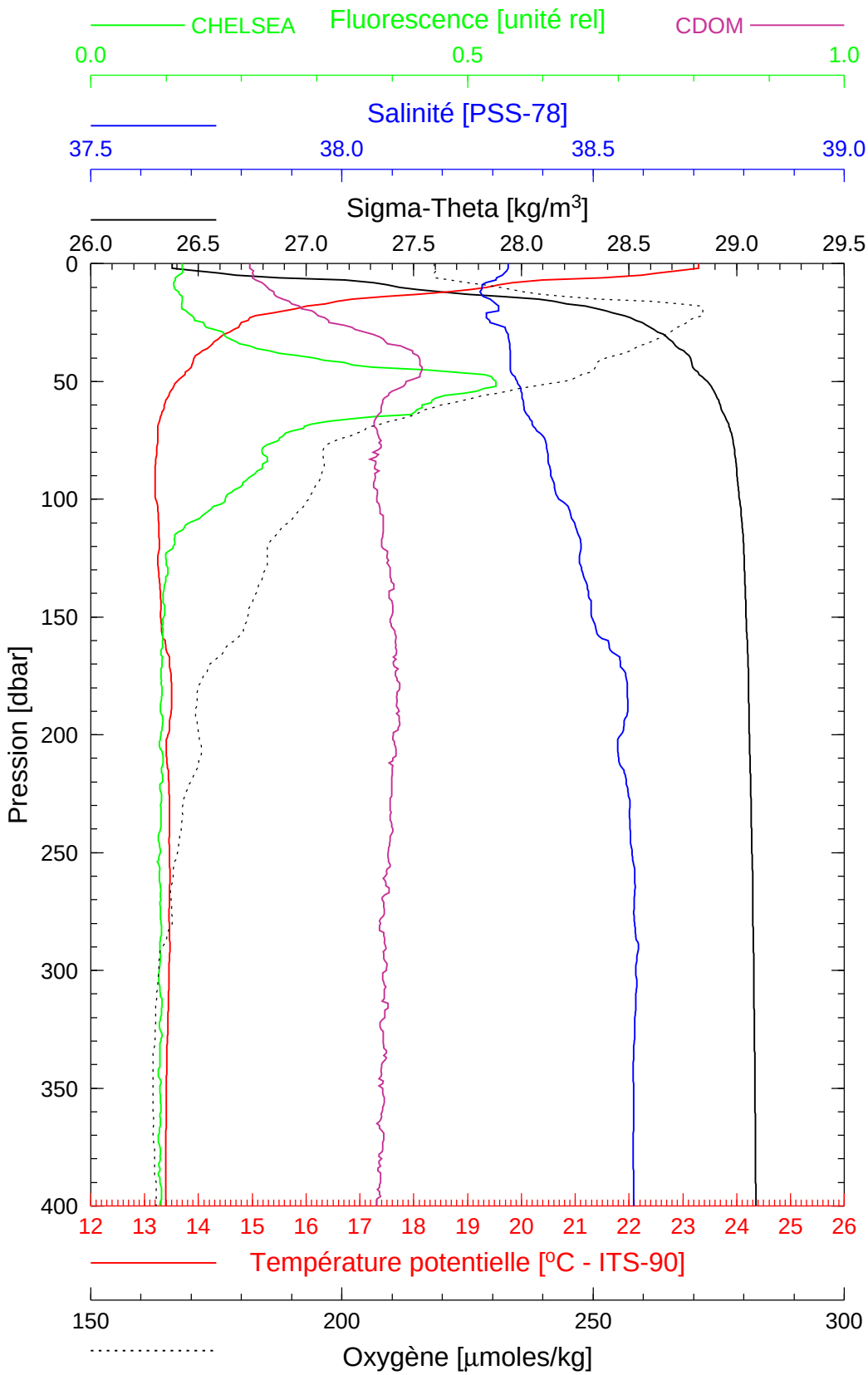


Date *06/07/2004* *Latitude* *43º22.170 N*

Heure déb *14h 37min [TU]* *Longitude* *07º53.034 E*

Boussole 34 **06/07/2004** **BOUS040706_03**

BOUS005

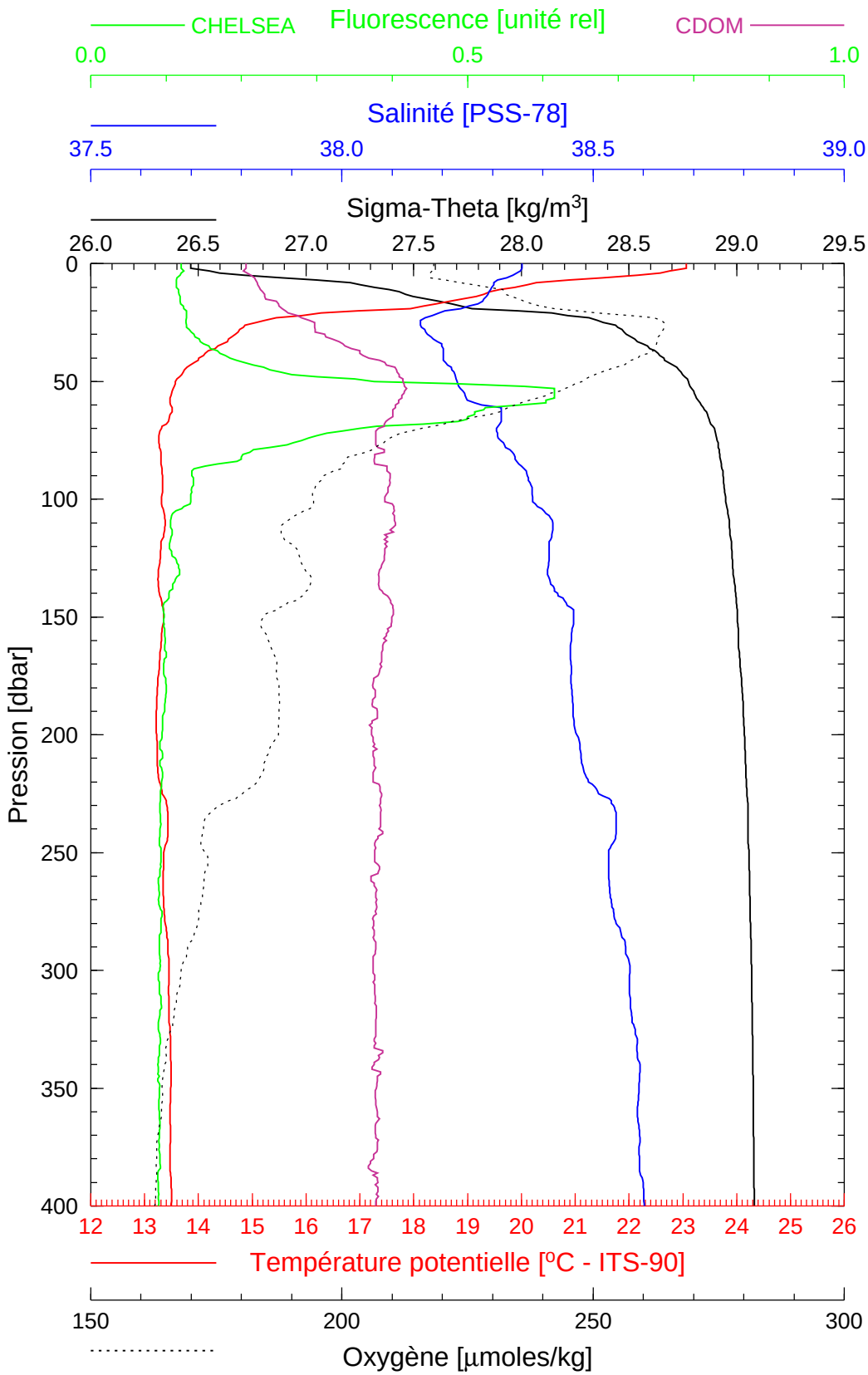


Date *06/07/2004* *Latitude* *43º25.032 N*

Heure déb *15h 39min [TU]* *Longitude* *07º47.940 E*

Boussole 34 **06/07/2004** **BOUS040706_04**

BOUS006

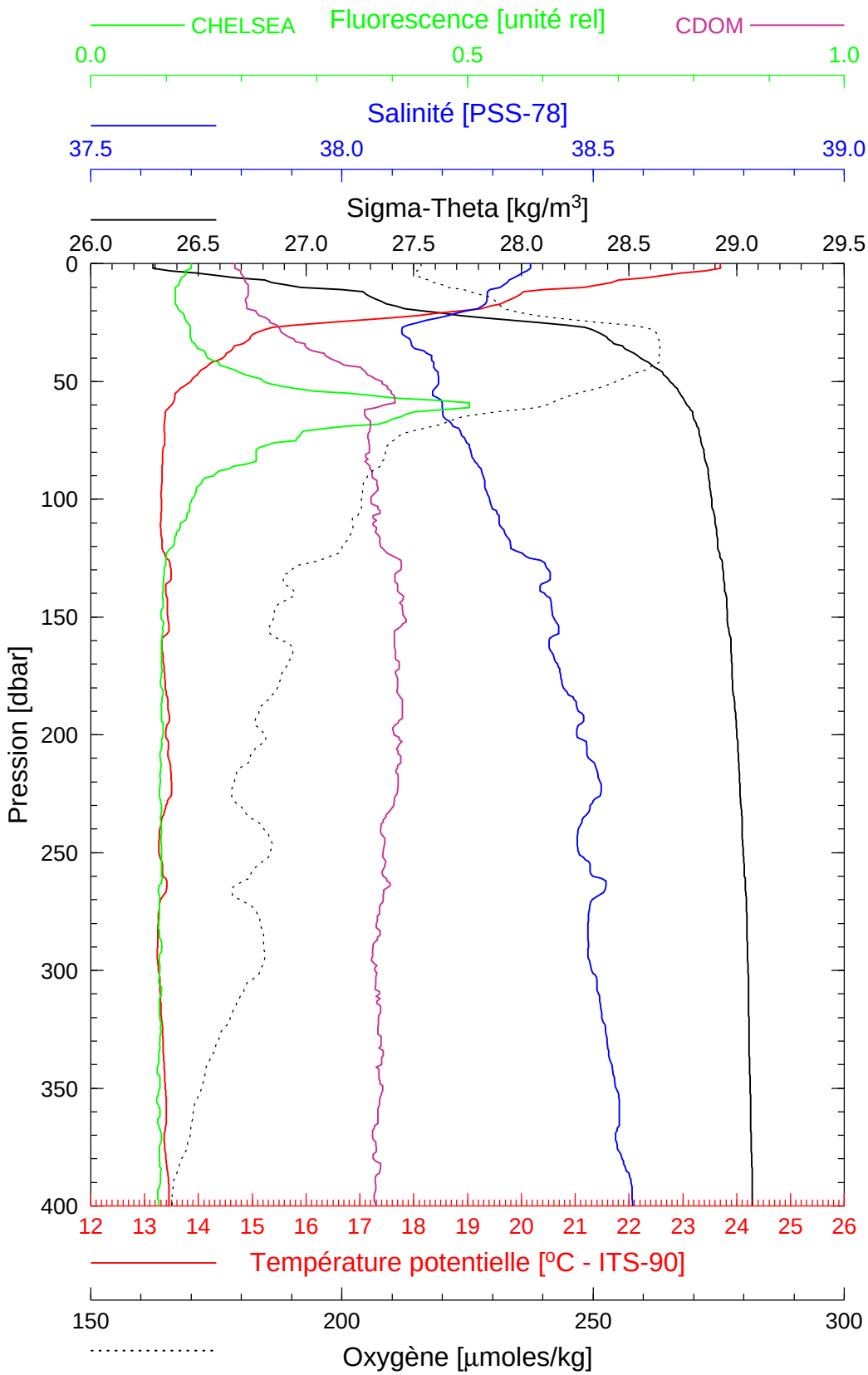


Date *06/07/2004* *Latitude* *43º27.995 N*

Heure déb *16h 41min [TU]* *Longitude* *07º42.504 E*

Boussole 34 **06/07/2004** **BOUS040706_05**

BOUS007

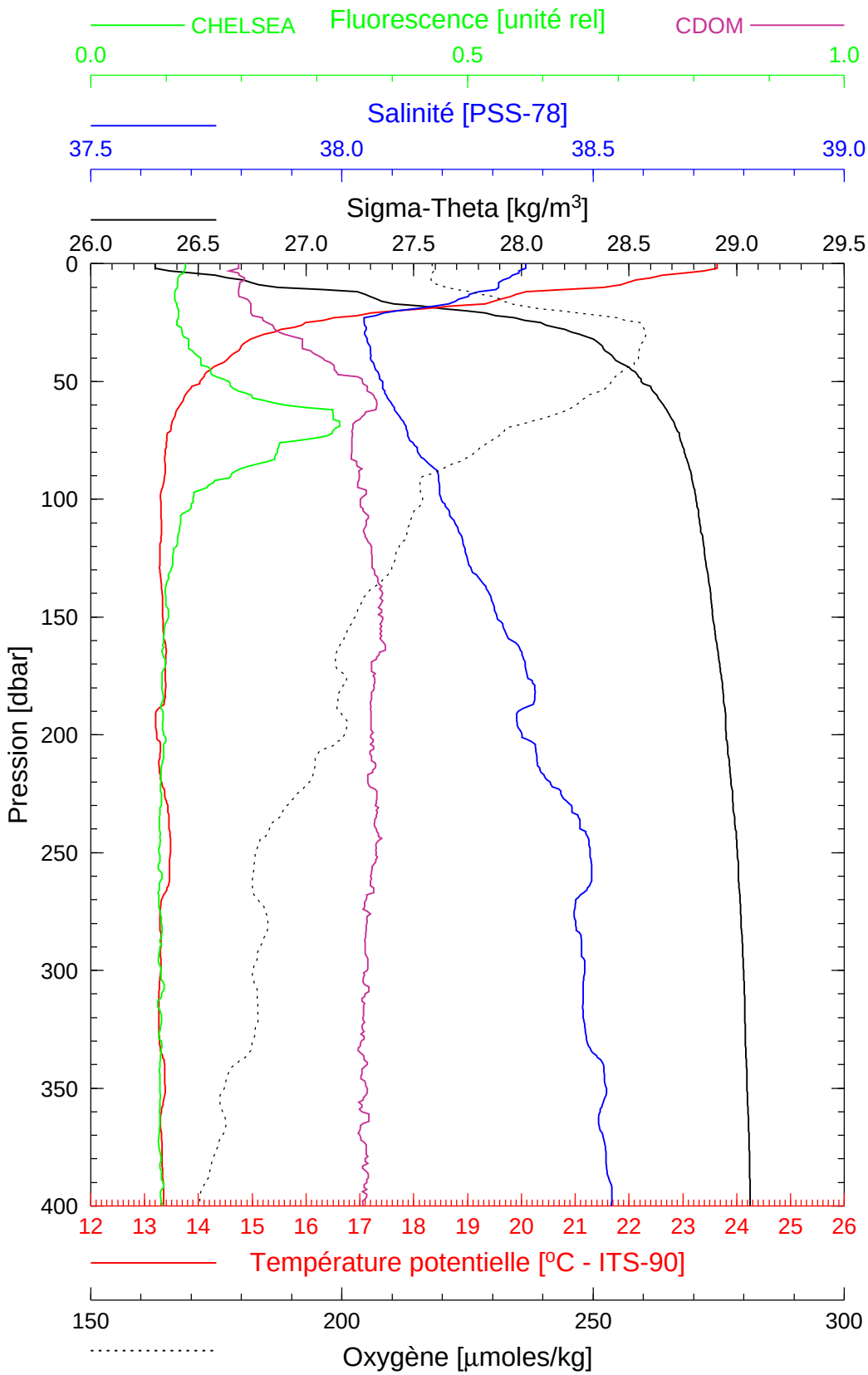


Date *06/07/2004* *Latitude* *43º31.084 N*

Heure déb *18h 06min [TU]* *Longitude* *07º37.009 E*

Boussole 34 **06/07/2004** **BOUS040706_06**

BOUS008

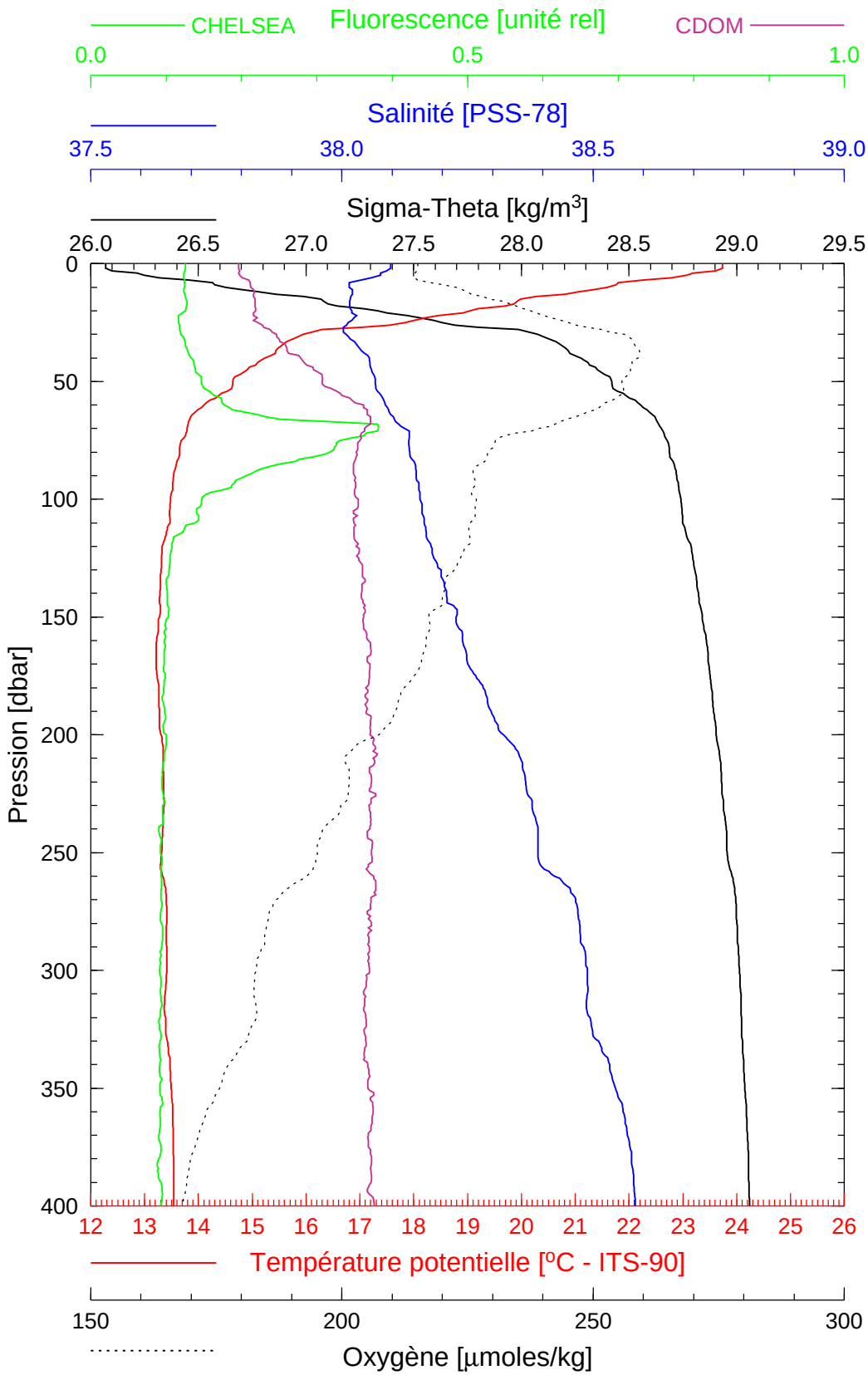


Date *06/07/2004* *Latitude* *43º33.990 N*

Heure déb *19h 21min [TU]* *Longitude* *07º30.872 E*

Boussole 34 **06/07/2004** **BOUS040706_07**

BOUS009



Date *06/07/2004* *Latitude* *43º37.517 N*

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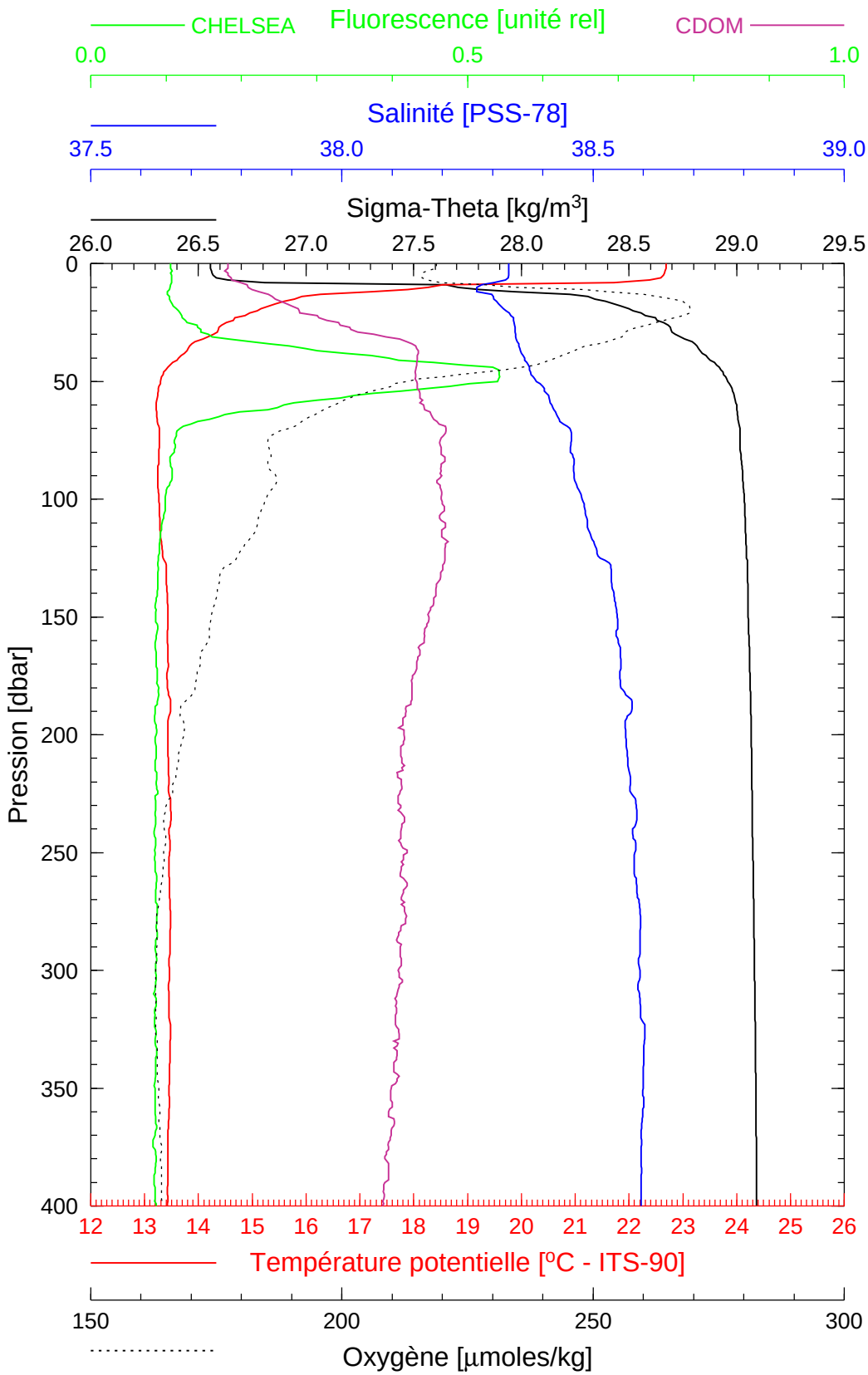
Boussole 34 **07/07/2004** **BOUS040707_01**

BOUS010



Date *07/07/2004* *Latitude* *43º22.109 N*

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