

BOUSSOLE Monthly Cruise Report

Cruise 26

September 23 – 25, 2003

Duty Chief: Alec Scott (alec.scott@obs-vlfr.fr)

Vessel: R/V Téthys II

(Captain: Rémy Lafond)

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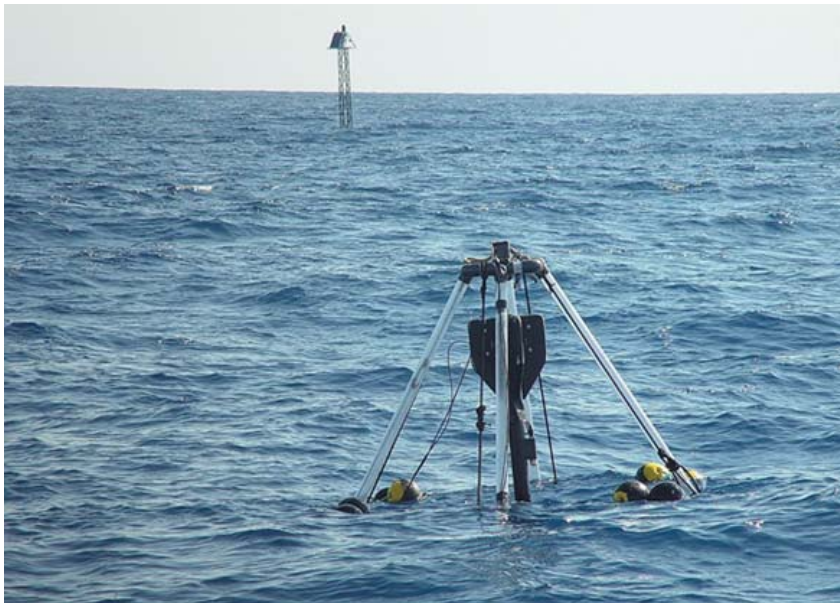


Fig 1. Synchronous measurements with the Boussole optics buoy and the SPMR profiler

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



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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

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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 gimble 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 uninterrupted transits between Nice and Boussole where there are clear skies, 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.

Scuba divers will be on board for at least one day of the cruise to exchange the optical sensors of the buoy with clean and calibrated replacements. They will be required to shut off the battery, make the changeover and then switch the battery back on. Once this exchange is complete, they will then make a visual check of the upper buoy structure to report any signs of corrosion or problems.

Cruise Summary:

This was the first monthly boussole cruise since the launch of the second generation boussole optics buoy. The last weather forecast before departure predicted increasing winds and unsettled weather for the 3 days. However, the divers boarded and were readied to work on the first day and scheduled to dive as the first activity once on site. On site, conditions were marginal for diving and since the Zodiac had recently been deemed unfit for service the support craft was a rather inadequate moulded plastic skiff which, if at all possible will be avoided in future. Upon arrival at the buoy, it was visible from the surface that a fishing net had become attached to the buoy structure. Despite sea conditions being at the limit of operability, the divers were able to cut the net free and let it sink to the seafloor under the weight of its battery. There were no other problems with the buoy reported by the divers. With sea conditions continuing to build and a requirement to return to port to replace a crew member, work was limited to a profile with a bathyphotometer for one of the divers before a bumpy ride back to Nice.

The second day started rather choppy but conditions gradually improved throughout the day. The optics program was able to continue with CTD and SPMR profiles. By the afternoon, it was calm enough to deploy the SPMR with surface float (see photo, figure 1 on cover). Despite the sea conditions, the sky remained fairly clear throughout the day but there were only SeaWiFS passes, both of which were at fairly low angles. However, conditions were once again deteriorating by the end of the day so the Tethys headed for port under rather bumpy conditions.

On the third day allocated for boussole, the cruise was cancelled due to forecasted windy conditions offshore and recent Dyfamed buoy data showing wave heights of over 1.5m. By midday, wave height data was reporting over 2 metres and wind speeds over 30 knots.

The constant flow fluorometer and oxygen sensor had been removed for servicing for the duration of the cruise so there was no quadrilateral spatial survey performed.

Cruise Report (all times in GMT)

Tuesday 23rd September, 2003

0430 Depart Port of Nice

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

0810 Dive operation started

0945 Divers back aboard Tethys.

1000 Bathyphotometer deployed

1105 Bathyphotometer on deck

1118 CTD Boussole 1. Max 400m. Bottle depths (m): 400,150,120,100,70,60,50,30,20,10, 5.

1150 CTD on deck

1200 Depart Boussole site for Port of Nice

1530 Arrive at Port of Nice

Wednesday 24th September, 2003

0430 Depart Port of Nice

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

0829 CTD Boussole 2. Max 400m. Bottle depths (m): 200,150,100,70,60,50,40,30,20,10, 5

0859 CTD on deck

0920 SPMR deployed

0940 SPMR on deck (1 profile)

1100 SPMR deployed.

1150 SPMR on deck (4 profiles).

1225 SPMR deployed.

1255 SPMR on deck (3 profiles).

1320 SPMR surface float deployed

1415 SPMR surface float recovered (3 profiles)

1433 CTD Boussole 3. Max 400m. Boussole Site.

1541 CTD Boussole 4. Max 400m. Transect Station 1 (43°25'N 7°28'E).

1640 CTD Boussole 5. Max 400m. Transect Station 2 (43°28'N 7°42'E).

1810 CTD Boussole 6. Max 400m. Transect Station 3 (43°31'N 7°37'E).
1911 CTD Boussole 7. Max 400m. Transect Station 4 (43°34'N 7°31'E).
2013 CTD Boussole 8. Max 400m. Transect Station 5 (43°37'N 7°25'E).
2053 CTD Boussole 9. Max 400m. Transect Station 6 (43°39'N 7°21'E).
2055 Depart Station 6 for Port of Nice
2140 Arrival at port of Nice

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

SeaWiFS: Viewing Times

Date Time Lat Lon Sat. Sat. Range Sun Sun Tilt Flags*

(UTC) (DEG) (DEG) Azi. Elev. (km) Azi. Elev.

23 Sep 2003 12:08:34 43.220 7.540 165.23 65.35 764 196.62 45.55 AFT 2

24 Sep 2003 11:11:22 43.220 7.540 107.03 20.48 1565 176.15 46.33 AFT 2 3

24 Sep 2003 12:49:00 43.220 7.540 268.02 39.69 1029 210.02 42.22 AFT 2

25 Sep 2003 11:51:58 43.220 7.540 129.33 48.67 900 190.84 45.47 AFT 2

25 Sep 2003 13:29:17 43.220 7.540 284.64 17.86 1688 221.78 37.51 AFT 2 3

MERIS: Viewing Times

Date Time Lat Lon Sat. Sat. Range Sun Sun Tilt Flags*

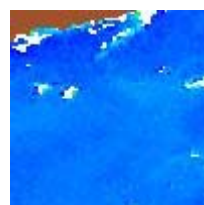
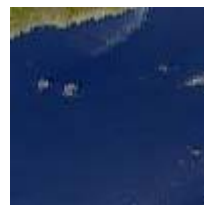
(UTC) (DEG) (DEG) Azi. Elev. (km) Azi. Elev.

23 Sep 2003 10:01:47 43.220 7.540 84.92 89.04 790 151.82 43.20 NADIR

Ligurian Sea Boussole Site Satellite Images

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

SeaWiFS



23rd September 2003

24th September 2003

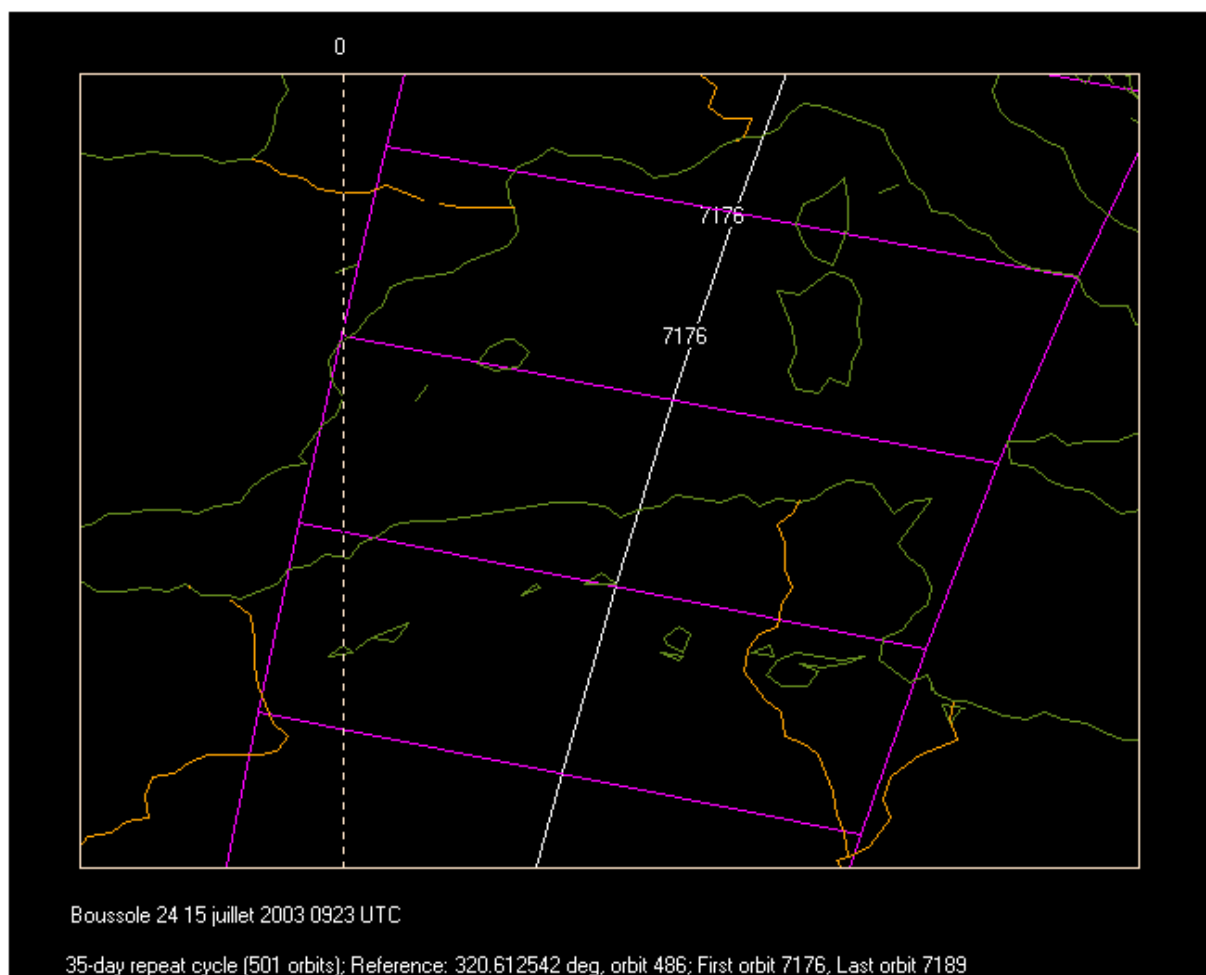
25th September 2003

Modis



23rd September 2003

ESOV-Generated Meris Swath Prediction

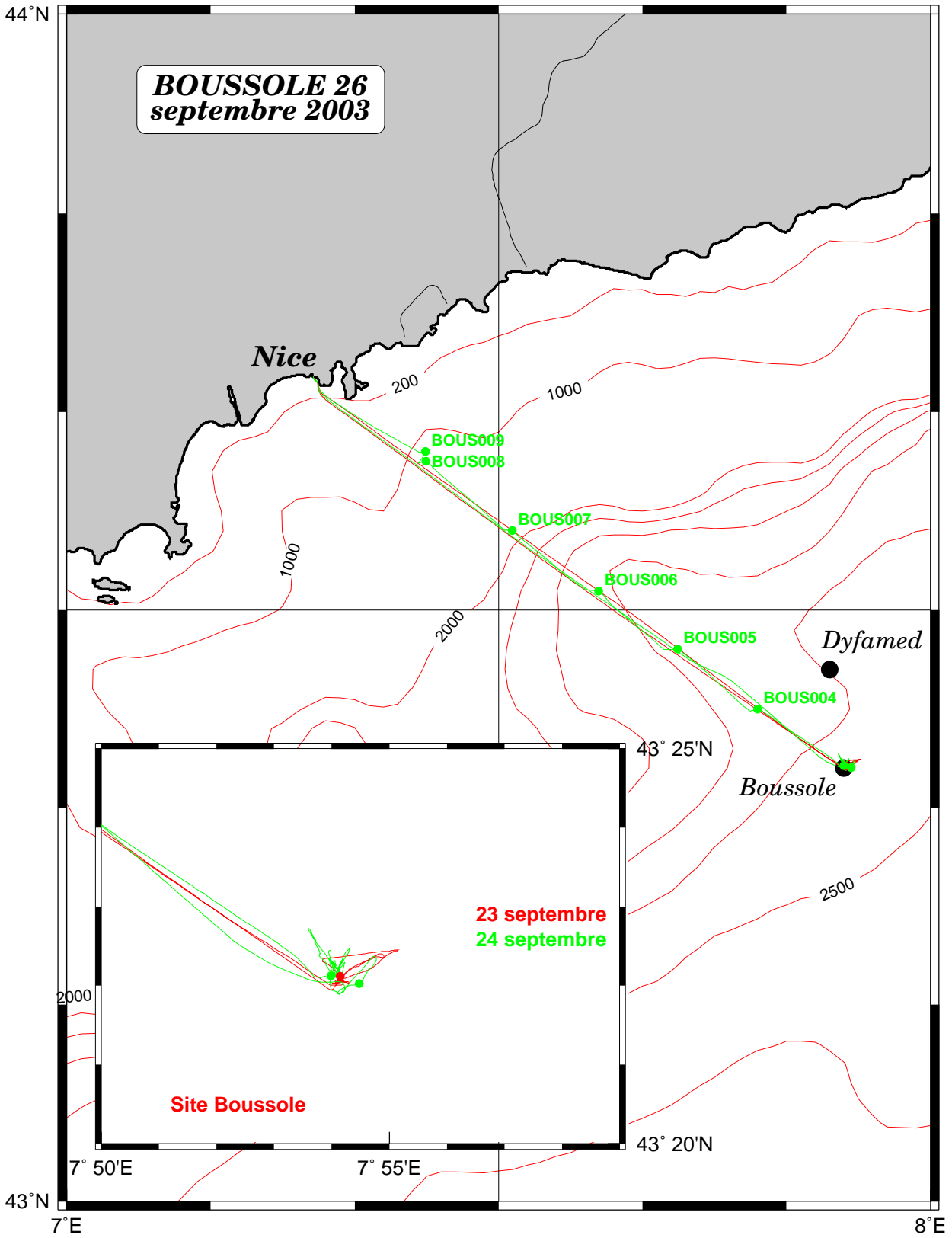


Boussole 24 15 juillet 2003 0923 UTC

35-day repeat cycle (501 orbits); Reference: 320.612542 deg, orbit 486; First orbit 7176, Last orbit 7189

Tabulated Cruise Summary for Boussole 26

Date	Sensors:	Black names	Profile names	CTD notes / satellite overpass	Start Time	Duration	Depth max	Latitude (N)	Longitude (E)	50	Other sensors	PAR	Start/Finish	Sky	Clouds	Qty (#B)	Weather	Wind speed	Wind dir.	Alm. Press	Humidity	Visibility	T air	T water	Sea	Sea	Swell height	Swell dir.	White horses
	spm&smr, smr	(file extension ".raw")	(file extension ".raw")		(hour:min)	(min:sec)	(meter)	(Degree)	(Degree)	(Minute)	(hyperspectral/HS)	cat	SF mark#																
23/09/03				CTD B OUS001	11:18	32:00	400	43	22:117	7	54.145					5	20	232	104.9	78		21.9							
24/09/03				CTD B OUS002	8:29	30:00	400	43	22:028	7	54.478					2	5	113	1016.5	68		21.8	22.4						
	spm&smr	bou240903back1			8:30	03:00	200	43	21:942	7	54.008					0	13	172	1017.2			good	21			0.5	N	occasional	
		bou240903back2	bou240903a		11:00	03:00	200	43	22:247	7	53.914					0	10	162	1017.4	61		vgood	21.2			0.5			
			bou240903b		11:09	04:15	200	43	22:371	7	53.987					0	10	162	1017.4	61		vgood	21.2			0.5			
			bou240903c		11:19	04:19	200	43	22:552	7	53.719					0	10	162	1017.4	61		vgood	21.2			0.5			
			bou240903d		11:40	03:00	200	43	22:163	7	54.119					0	7	140	1017.5	66		vgood	22.3			0.5			
			bou240903e		12:29	04:30	200	43	22:265	7	54.054					0	7	140	1017.5	66		vgood	22.3			0.5			
			bou240903f		12:41	04:14	200	43	22:312	7	53.978					0	7	140	1017.5	66		vgood	22.3			0.5			
			bou240903g		12:50	04:12	200	43	22:118	7	54.063					0	11	117	1018	70		vgood	20.9			0.5			
			bou240903h		13:27	03:45	200	43	22:144	7	54.044					0	11	117	1018	70		vgood	20.9			0.5			
			bou240903i		13:45	07:01	200	43	22:222	7	54.027					0	11	117	1018	70		vgood	20.9			0.5			
			bou240903j		14:05	07:01	200	43	22:222	7	54.027					0	11	117	1018	70		vgood	20.9			0.5			
			bou240903k		14:23	03:00	400	43	22:156	7	53.861					2	13	122	1018.1				21	24.8					
			bou240903l		14:28	03:00	400	43	22:156	7	53.861					2	13	122	1018.1				21	24.8					
			bou240903m		15:41	27:00	400	43	24:964	7	42.868					3	13	144	1018.4				21.1	22.6					
			bou240903n		15:44	27:00	400	43	24:964	7	42.868					3	13	144	1018.4				21.1	22.6					
			bou240903o		18:40	27:00	400	43	24:964	7	42.868					3	13	144	1018.4				21.1	22.6					
			bou240903p		18:10	28:00	400	43	30:973	7	38.94					7	15	124	1019	67			21.3	21.6					
			bou240903q		19:11	28:00	400	43	34:028	7	30.653					7	132	1020.5	71				21.5	22.6					
			bou240903r		20:13	28:00	400	43	37:515	7	24.659					5	167	1021	72				21.6	22.6					
			bou240903s		20:53	28:00	400	43	38:007	7	24.918					6	215	1021.3	72				21.7	22.6					

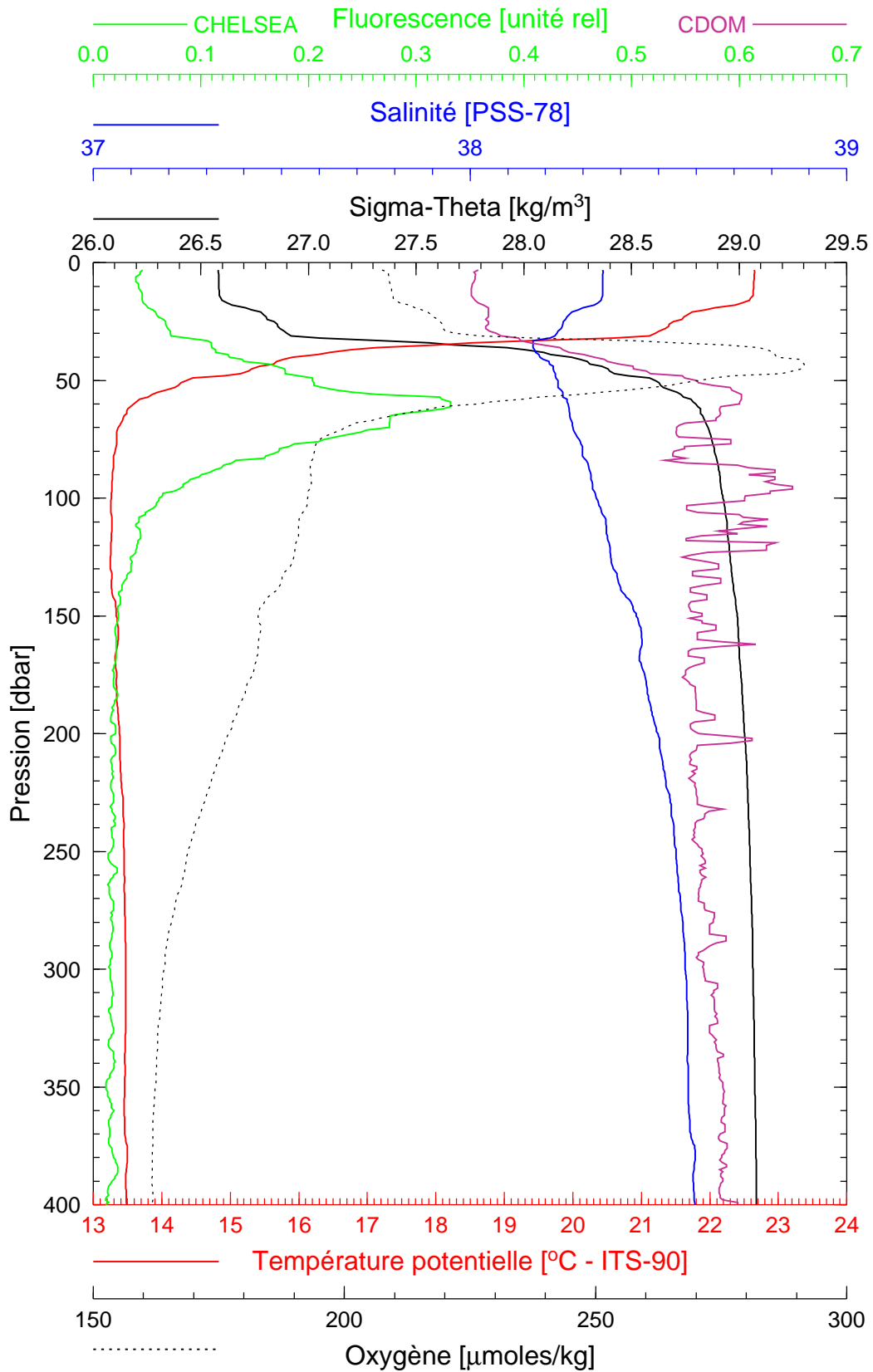


Boussole 26

23/09/2003

BOUS030923_01

BOUS001



Date 23/09/2003
Heure déb 11h 18min [TU]

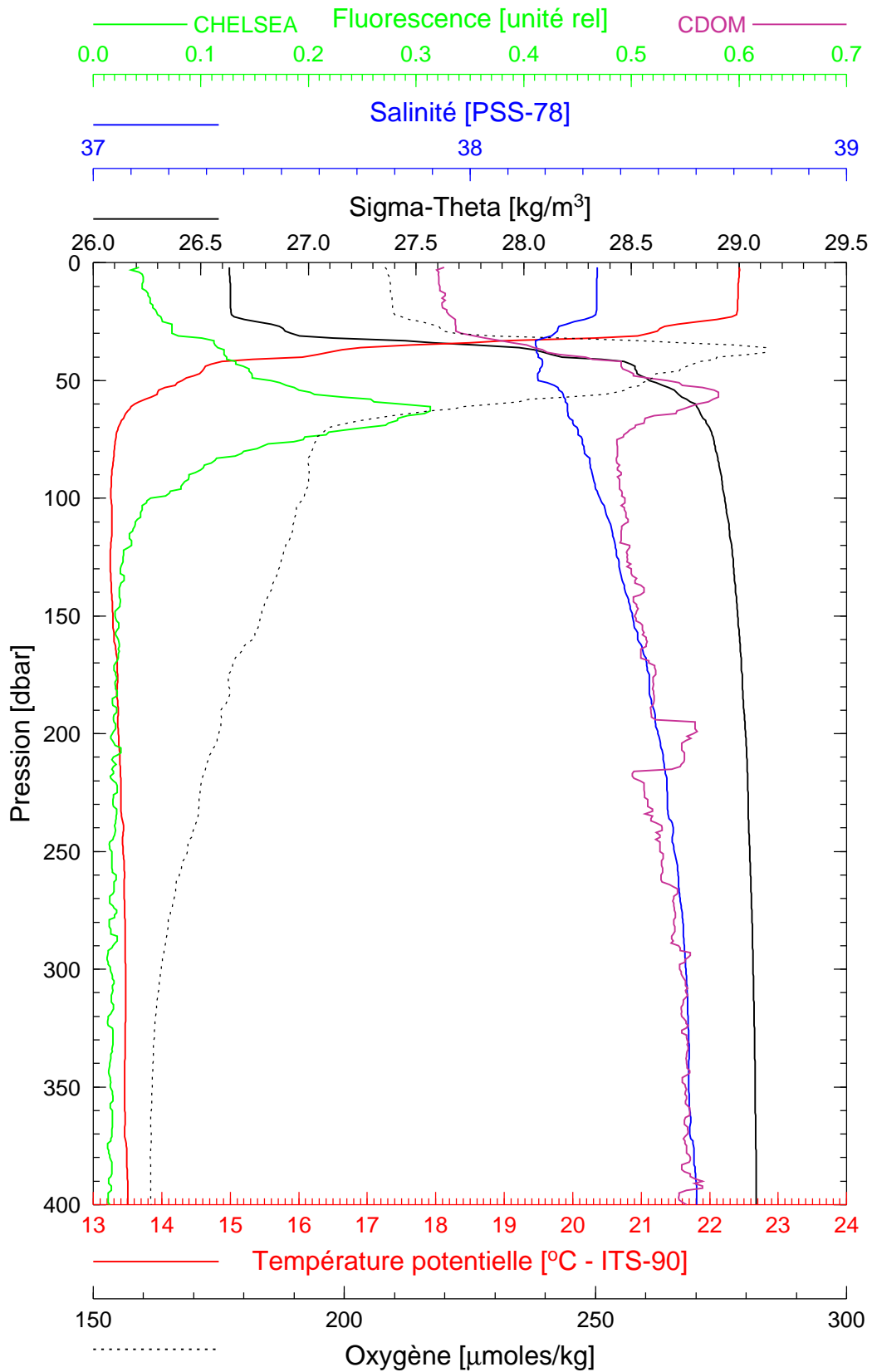
Latitude 43°22.117 N
Longitude 07°54.145 E

Boussole 26

24/09/2003

BOUS030924_01

BOUS002



Date 24/09/2003
Heure déb 08h 29min [TU]

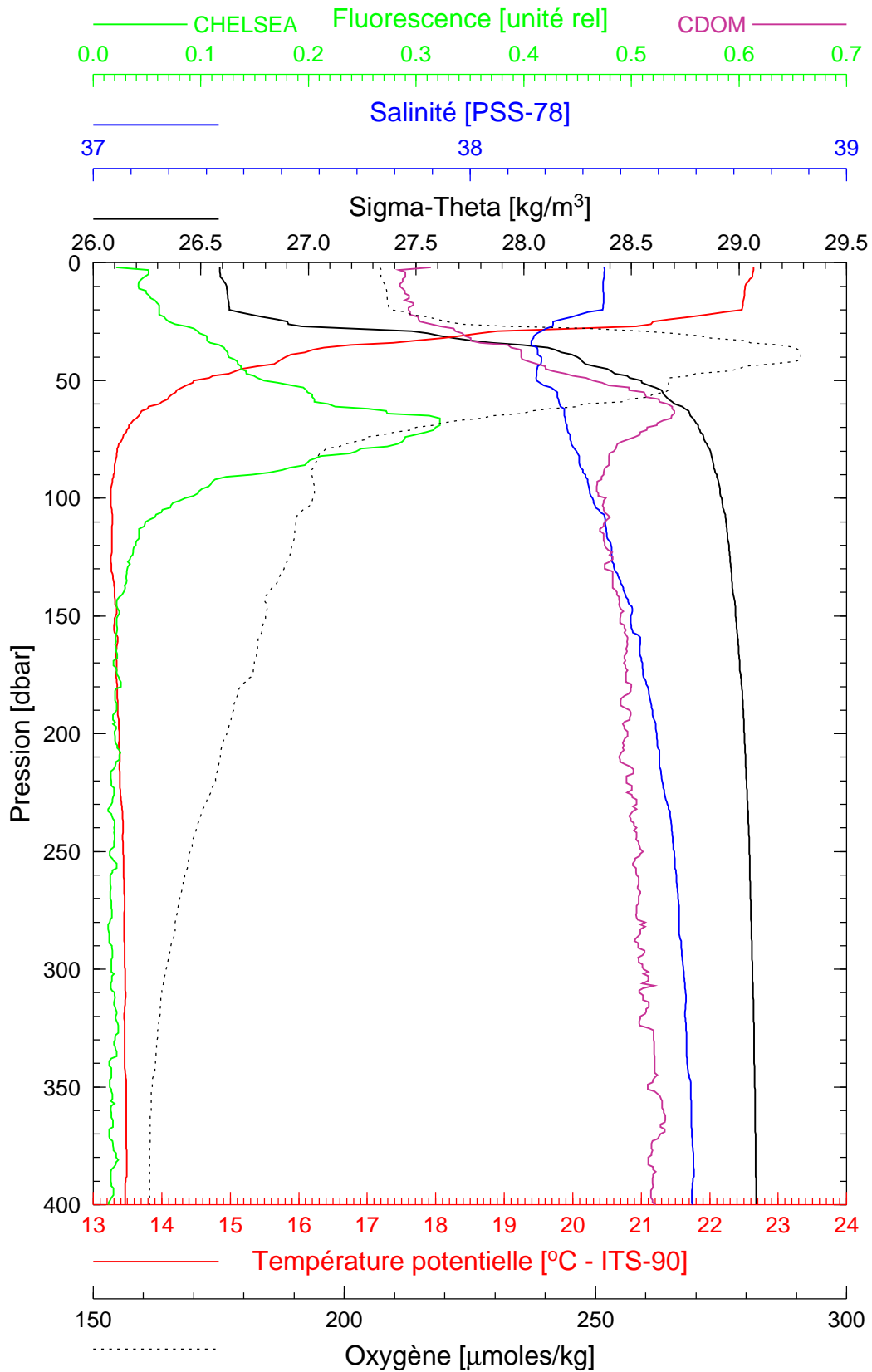
Latitude 43°22.028 N
Longitude 07°54.478 E

Boussole 26

24/09/2003

BOUS030924_02

BOUS003



Date 24/09/2003
Heure déb 14h 33min [TU]

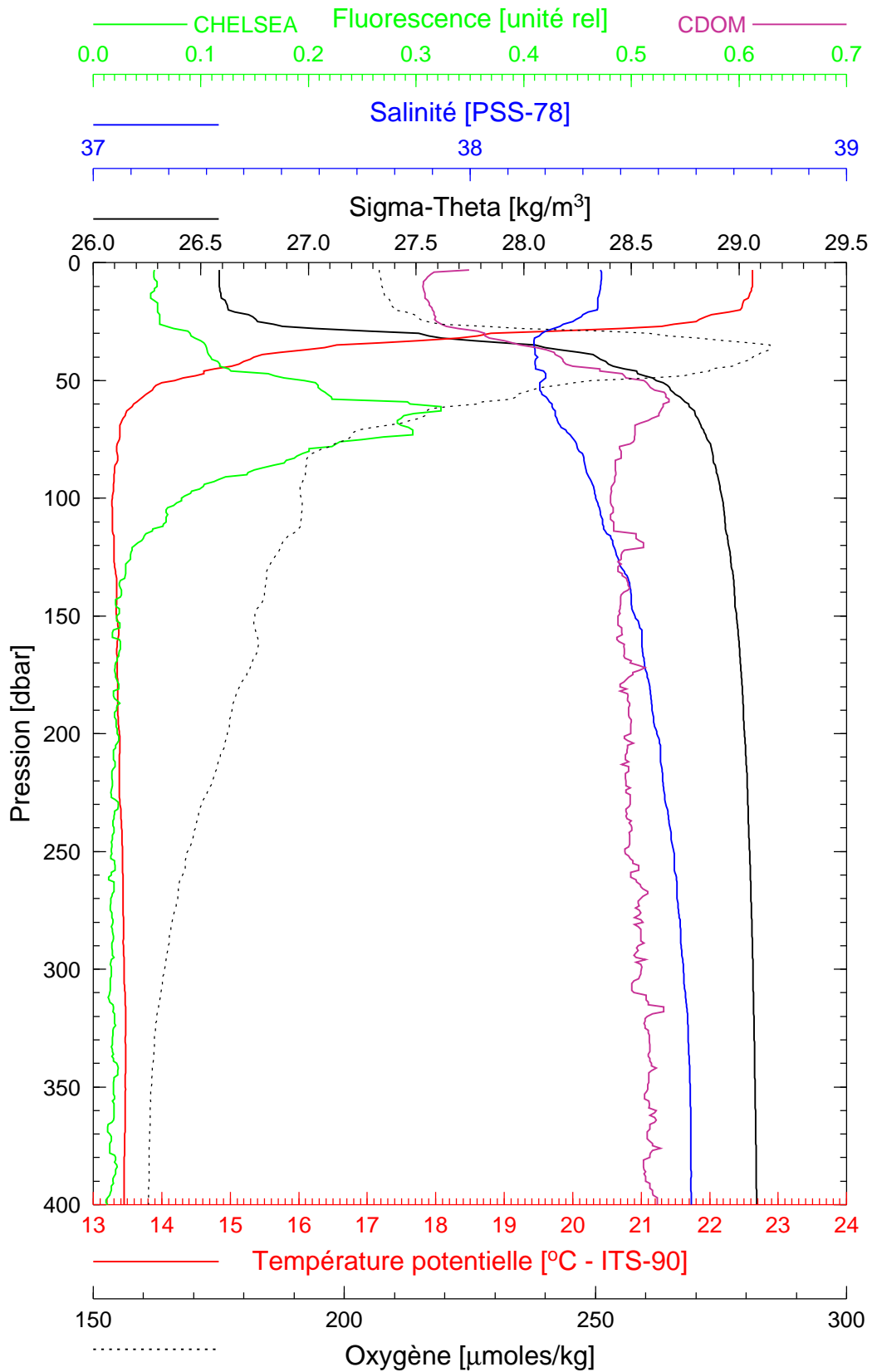
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Longitude 07°53.991 E

Boussole 26

24/09/2003

BOUS030924_03

BOUS004



Date 24/09/2003
Heure déb 15h 41min [TU]

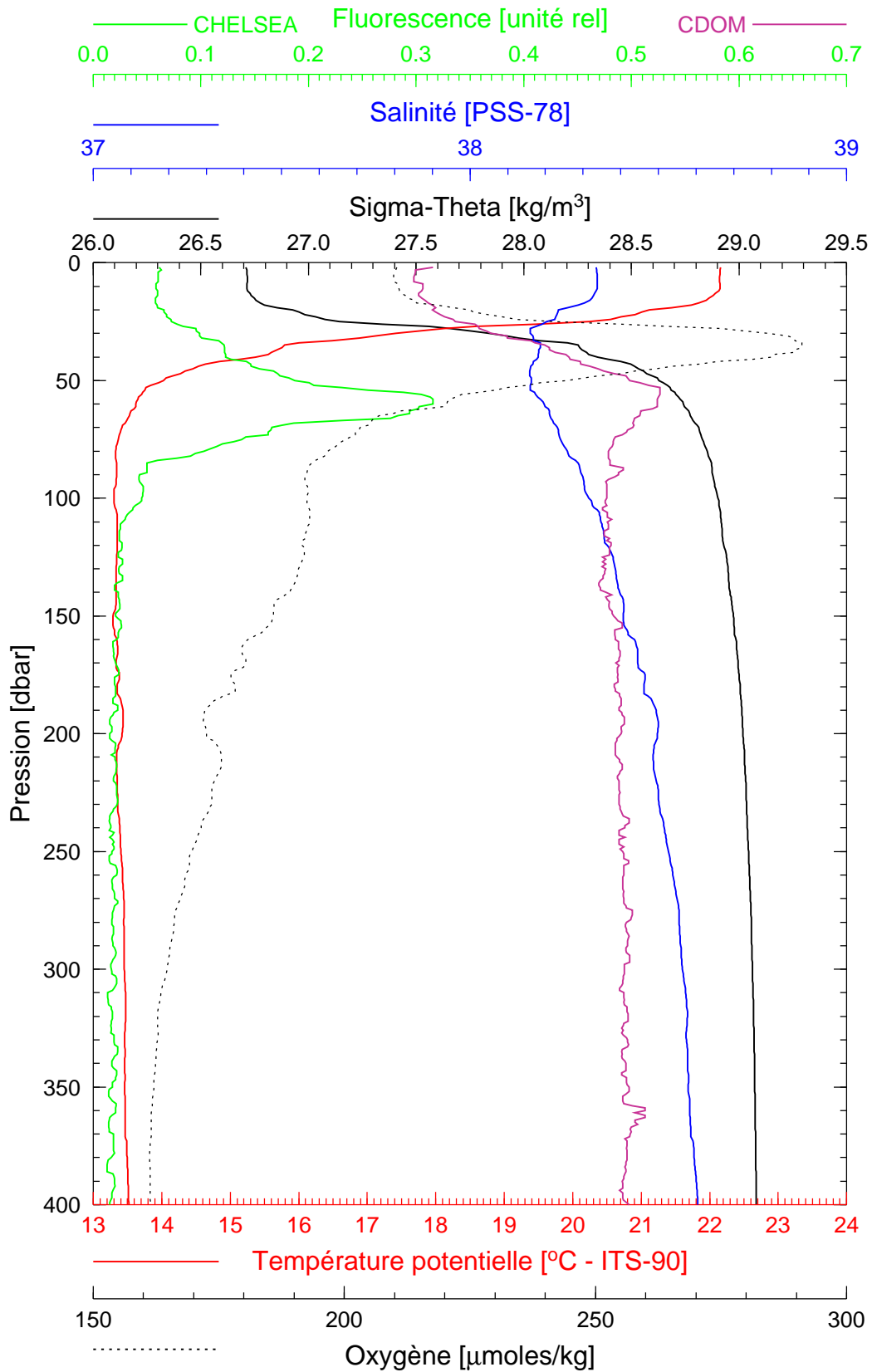
Latitude 43°24.984 N
Longitude 07°47.988 E

Boussole 26

24/09/2003

BOUS030924_04

BOUS005



Date 24/09/2003
Heure déb 16h 40min [TU]

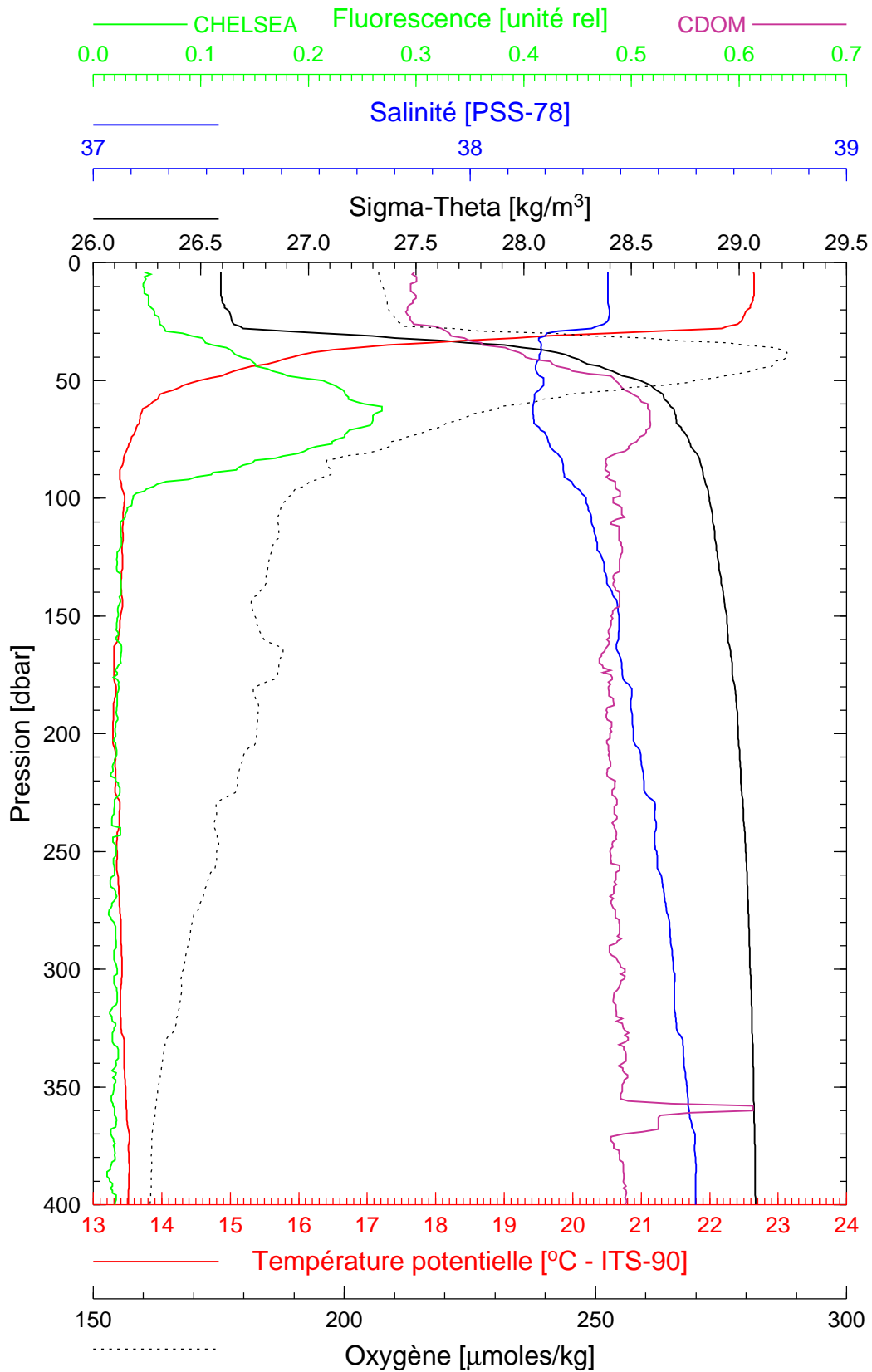
Latitude 43°28.034 N
Longitude 07°42.429 E

Boussole 26

24/09/2003

BOUS030924_05

BOUS006



Date 24/09/2003
Heure déb 18h 10min [TU]

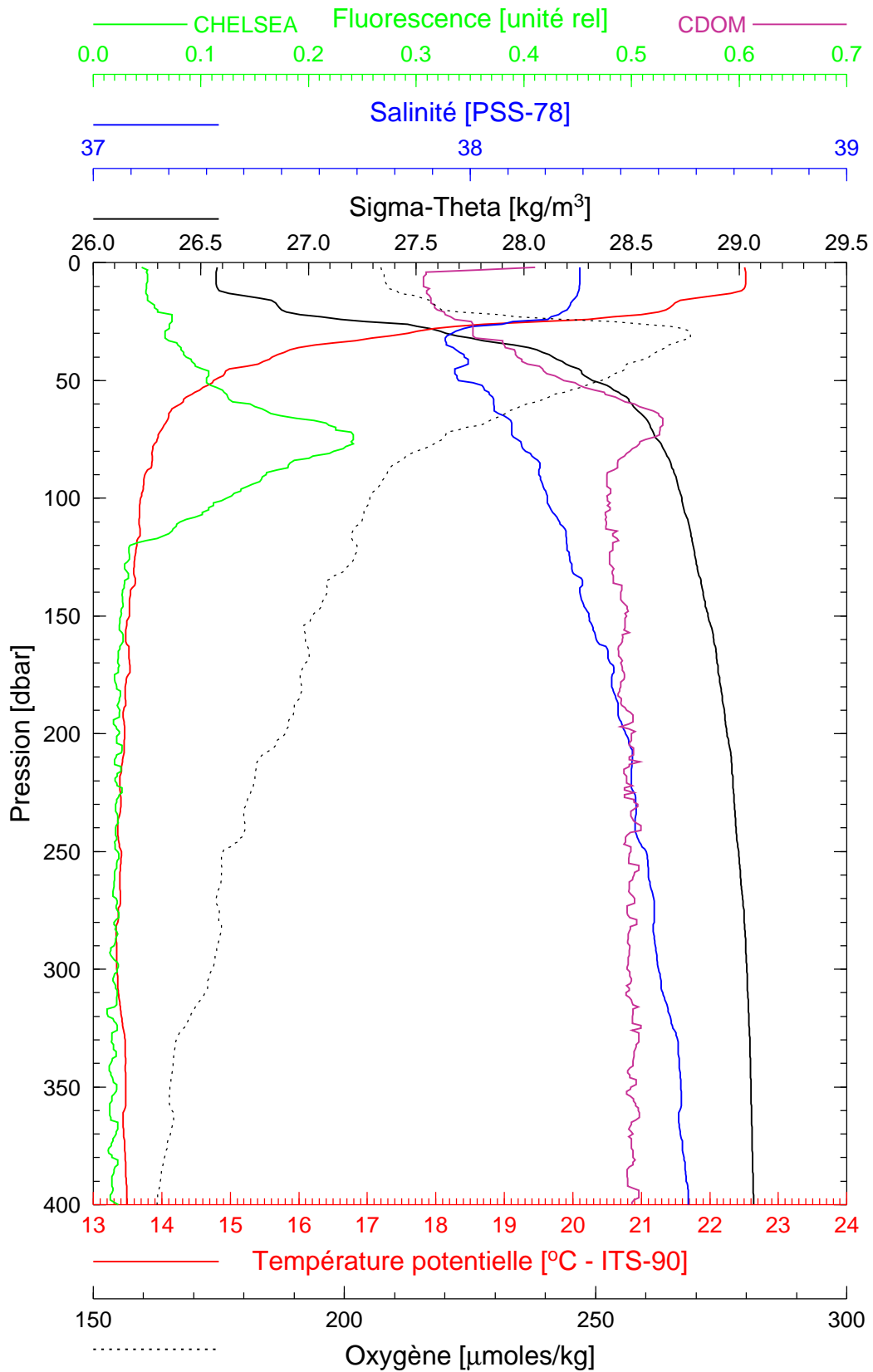
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Boussole 26

24/09/2003

BOUS030924_06

BOUS007



Date 24/09/2003
Heure déb 19h 11min [TU]

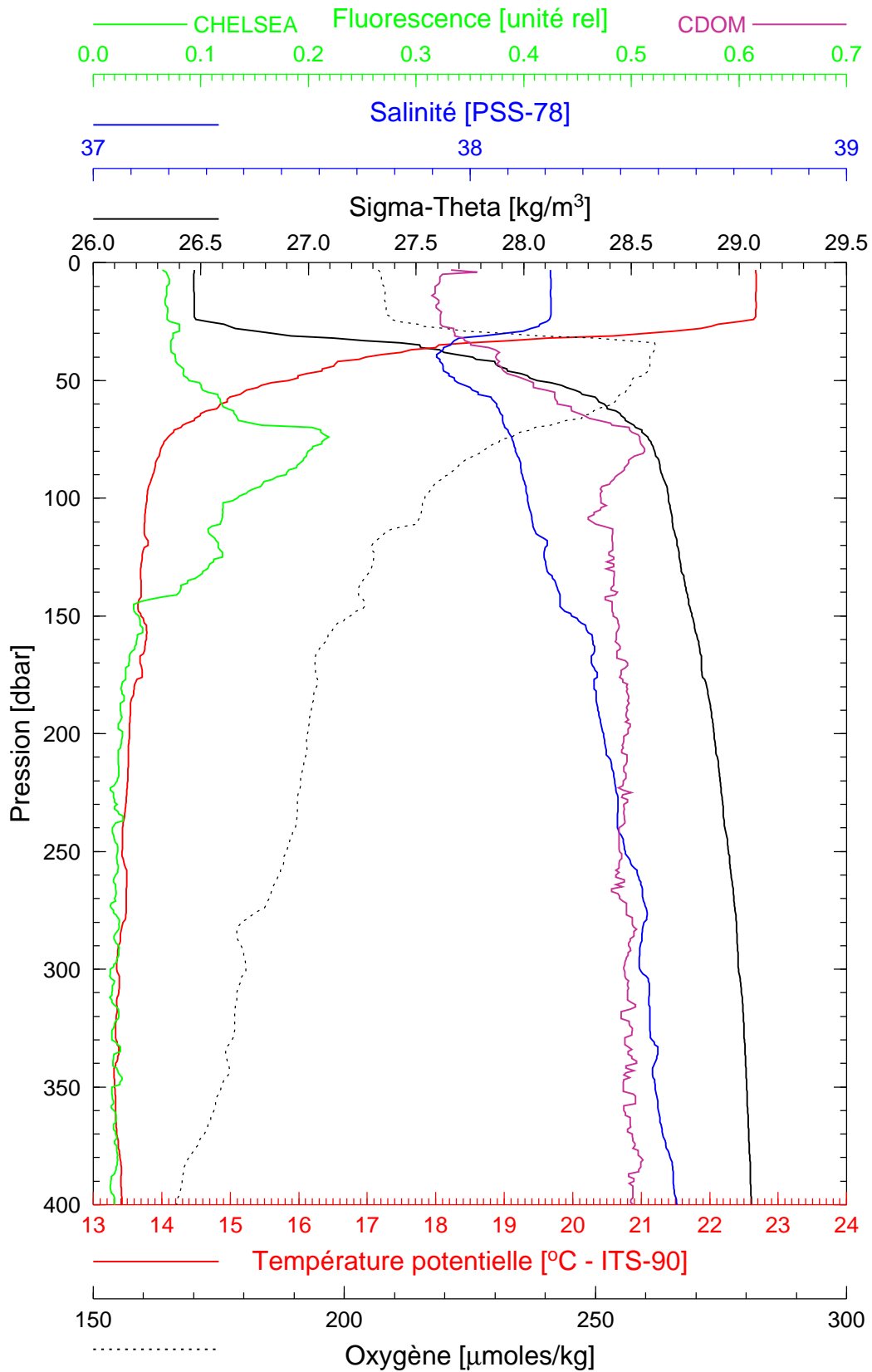
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Longitude 07°30.953 E

Boussole 26

24/09/2003

BOUS030924_07

BOUS008



Date 24/09/2003
Heure déb 20h 13min [TU]

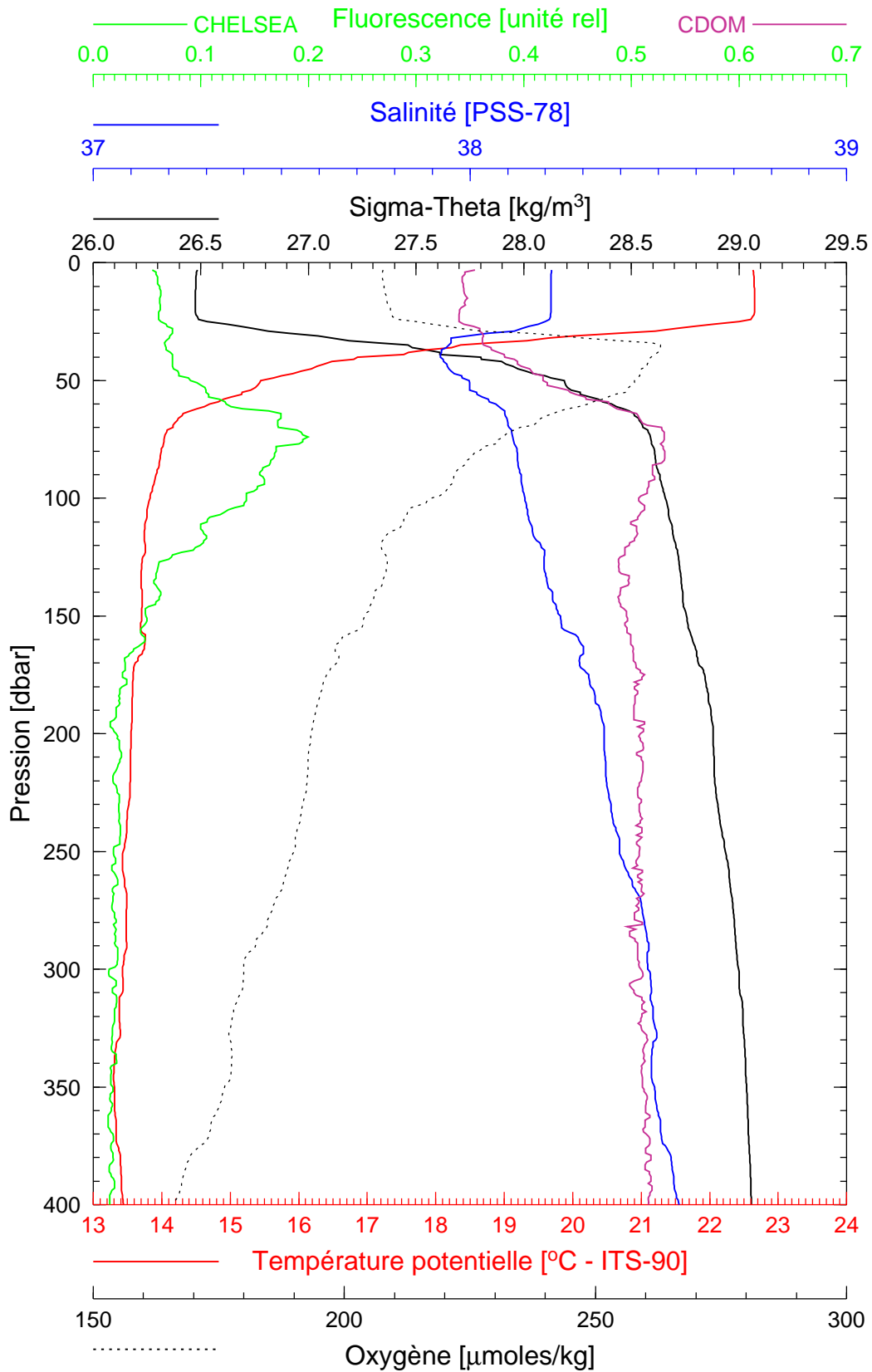
Latitude 43°37.515 N
Longitude 07°24.959 E

Boussole 26

24/09/2003

BOUS030924_08

BOUS009



Date 24/09/2003
Heure déb 20h 53min [TU]

Latitude 43°38.007 N
Longitude 07°24.918 E