BOUSSOLE Monthly Cruise Report

Cruises 46
October 06 – 09, 2005

Duty Chief: Edouard Leymarie (leymarie@obs-vlfr.fr)
Vessel: R/V Téthys II
(Captain: Alain Stépahn)

Science Personnel: Edouard Leymarie, Dominique Tailliez, Fanny Tièche, Katarzyna Niewiadomska and 3 divers (David Luquet, Laurent Giletta and Jean de Vaugelas)

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

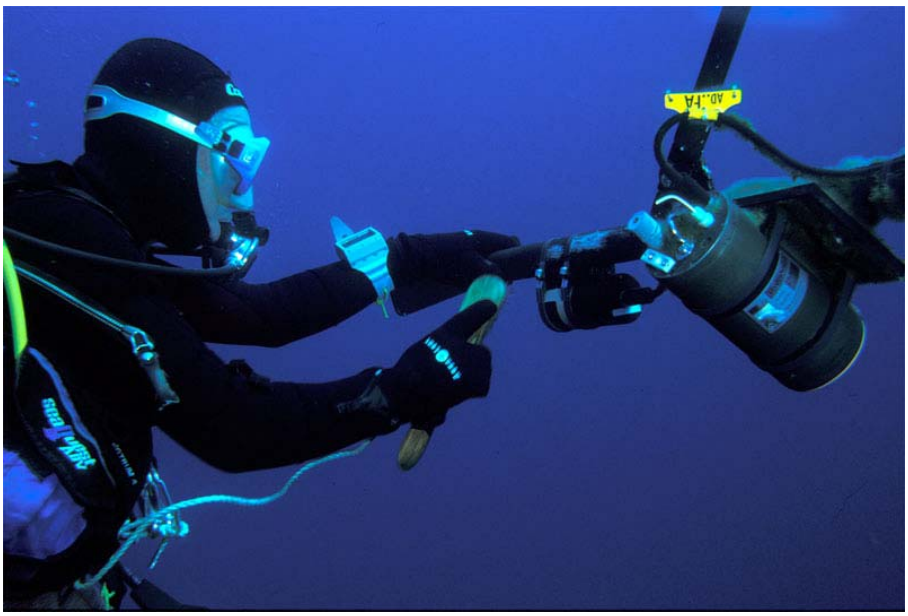


Fig 1. Diver Jean de Vaugelas is cleaning buoy structure (9 meters arm).

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

Contents

Cruise Objectives

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 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 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 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.

3 CNRS divers (David Luquet, Laurent Giletta and Jean de Vaugelas) will be onboard on 06 October 2005 to take some pictures and clean and check the buoy structure under the sea surface.

Fanny Tièche will be present on 07 October for the Ultra Path water sampling/filtration and for a Kishino set of filtration.

Katarzyna Niewiadomska, PhD. Student at LOV, will be onboard on 08 October 2005.

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.

Cruise Summary

Sea conditions were quite rough for the first day, progressively declining to rather calm for the last day.

A problem with the ship motors prevented any operation at sea for the second day (Friday 07 October 2005), as the ship had to go back to the port of Nice for repairs.

A major shortcut appeared in the CTD to carrousel cable, preventing quite always to sample Sea water for filtrations.

A Lagrangian buoy from Meteo-France was launched close to the Eulerian (usual) Meteo-France buoy on 06 October.

Thursday 06 October 2005

Weather for this day was quite rough (20-25 knots, H1/3 = 1.2 to 1.3 m), preventing any CTD or SPMR measurements. Only the divers went at Sea and a Lagrangian Meteo-France buoy was launched close to the other (fixed) Meteo-France buoy. Divers noted the buoy arms orientation, in order to check the DacNET compass reference. The arm equipped with radiometers were oriented to the South at 09h30 UTC.

Friday 07 October 2005

A first problem with the ship motor delayed the departure till 05h20 UTC, then a second problem prevented to reach the BOUSSOLE site, as a U-turn was decided at 08h30 UTC.

Saturday 08 October 2005

Sky conditions were good for optics. The sea was choppy, allowing to deploy the CTD and the SPMR. There was whereas a problem with closing the Niskyn bottle, as the carrousel wasn't communicating with the PC. Dominiqe Tailliez reconnected the CTD to the electric cable, and the problem was fixed, at least for that day.
Finally, 7 CTD were realized (including 5 transect CTD), 5 CIMEL measurements, 3 SPMR profiles and 1 Secchi disk measurements were realized.

Sunday 09 October 2005

Sea conditions were rather good, and the sky was blue. 3 CTD were realized, but the problem appeared again, so that a shortcut in the CTD to carrousel cable was supposed. 4 SPMR profiles were realized (3 with pyramidal floating system), 8 CIMEL measurements and 1 Secchi disk measurements were realized.

Cruise Report

06 October 2005 (UTC)

0500 Departure from port of Nice.
0850 Divers at Sea.
1015 Buoy data uploading.
1120 Meteo-France buoy launch.
1125 Departure for port of Nice.
1415 Arrival to port of Nice.

07 October 2005

0430 Problem with the ship motors.
0520 Departure from port of Nice.
0830 U-turn to port of Nice because of another problem with the ship.
1200 Arrival in port of Nice.

08 October 2005

0430 Departure from port of Nice.
0757 CTD 1 with no water sampling as there was no connection between CTD and carrousel.
0807 CIMEL 1.
1040 SPMR profiles 1, 2, and 3 without floating system.
1048 CIMEL 2.
1100 CIMEL 3.
1140 CTD 2 with water sampling at 5 and 10 meters.
1215 Buoy data retrieval.
1256 CTD 3 at station 1 (43°25'N 07°48'E).
1258 CIMEL 4 (clouds) at station 1 (43°25'N 07°48'E).
1332 CIMEL 5 (clouds) at station 2 (43°28'N 07°42'E).
1355 CTD 4 at station 2 (43°28'N 07°42'E).
1459 CTD 5 at station 3 (43°31'N 07°37'E).
1602 CTD 6 at station 4 (43°34'N 07°31'E).
1704 CTD 7 at station 5 (43°37'N 07°25'E).
1800 Arrival at port of Nice.

09 October 2005

0450 Departure from port of Nice.
0819 CTD 8 with water sampling at 200, 100, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters.
0824 CIMEL 6.
0948 CIMEL 7.
1017 SPMR profiles 4, 5, 6, and 7 (4, 6 and 7 with floating system).
1034 CIMEL 8.

1109 CIMEL 9.
1151 CTD 9.
1200 Secchi measurement 1.
1213 CIMEL 10.
1219 CIMEL 11.
1228 CIMEL 12.
1326 CIMEL 13 at 43°27'N 07°43'E (near station 1).
1620 Arrival at port of Nice.

Calculated Swath paths for MERIS Sensor (ESOV Software)

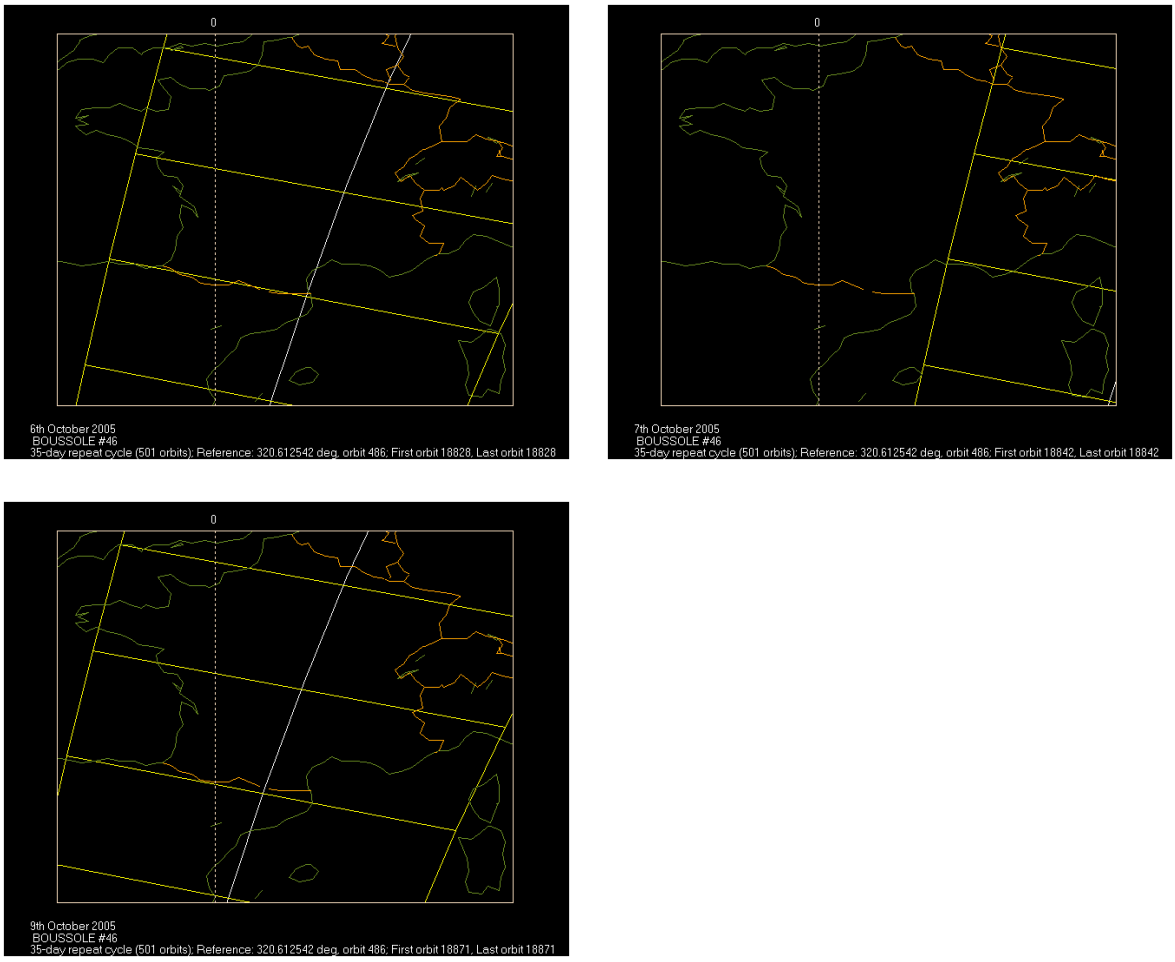
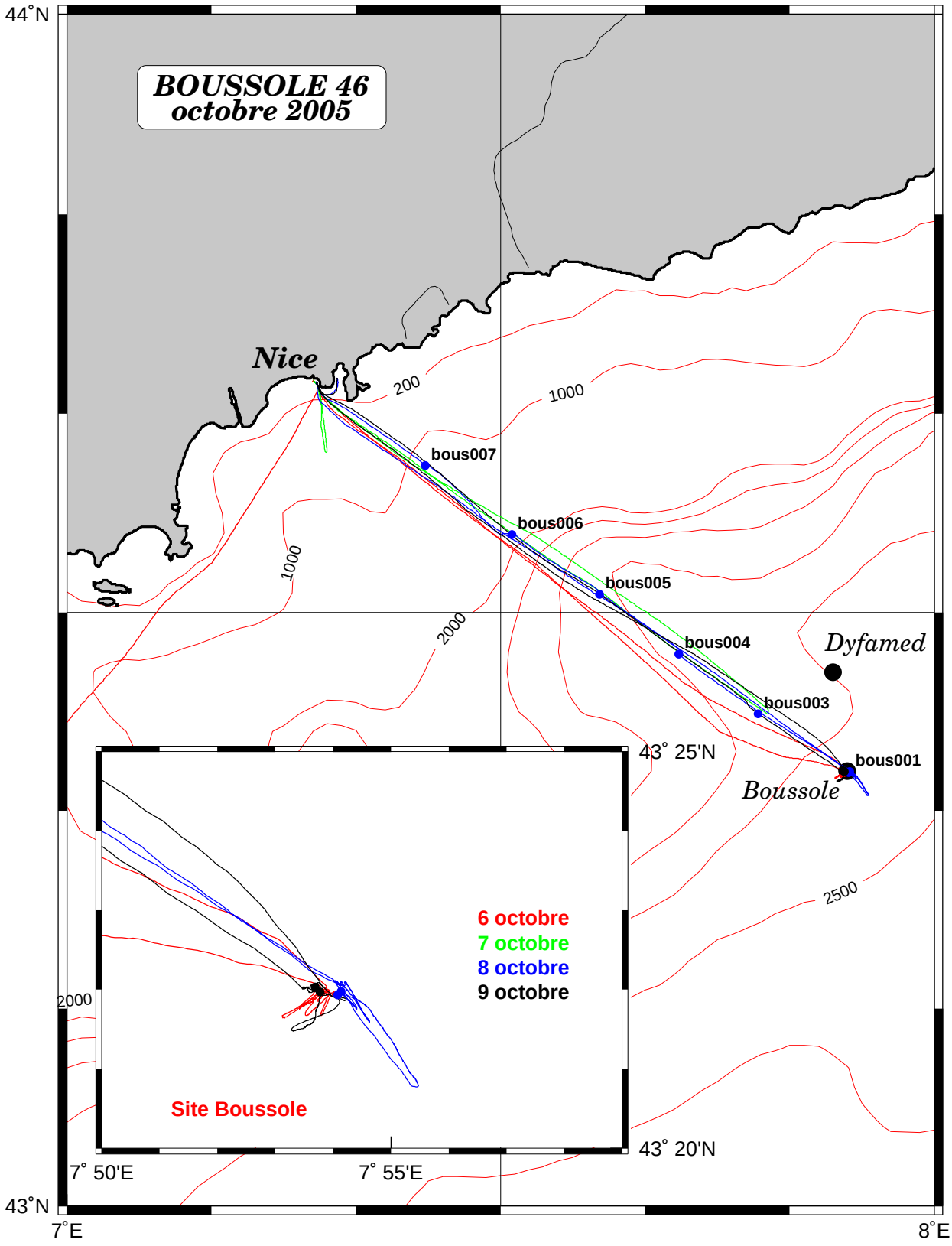


Figure 3. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for 06, 07 and 09 October 2005.

Appendix

Cruise Summary Table for Boussole 46

Date	Black names	Profile names	CTD notées /	Start Time	Duration	Depth max	Latitude (N)		longitude		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
			CTDBOUS001	07:57	34:00	400	43	21.976	7	54.139				blue	far Cu	2	11 kn	276	1019.7	74	very good	18.7	18.5	choppy	0,7 m		some
				08:07	05:00		43	22.000	7	54.000	CIMEL 1	Tau atmos.		blue	far Cu	2			1019.6								
	bou081005black1			09:51	03:00																						
		bou081005AA		10:06	04:54	202	43	22.000	7	54.000				blue	far Cu	2	10 kn	325	1019.7	81	very good	18.2		choppy	0,7 m		some
		bou081005AB		10:16	04:32	200	43	22.000	7	54.000				blue	far Cu	2	10 kn	325	1019.7	81	very good	18.2		choppy	0,7 m		some
		bou081005AC		10:27	04:36	200	43	22.000	7	54.000				blue	far Cu	2	10 kn	325	1019.7	81	very good	18.2		choppy	0,7 m		some
	bou081005black2			10:41	03:00																						
08/10/2005				10:48	04:00		43	22.000	7	54.000	CIMEL 2	Tau atmos.		blue	far Cu	2			1019.7								
				11:00	03:00		43	22.000	7	54.000	CIMEL 3	Tau atmos.		blue	far Cu	2			1019.7								
			CTDBOUS002	11:40	30:00	400	43	21.936	7	54.077				blue	far Cu	2	10 kn	220	1019.4	75	very good	18.2	18.6	choppy	0,5 m		no
			CTDBOUS003	12:56	21:00	400	43	24.903	7	47.834				blue	far Cu	2	7 kn	227	1019.5	76	very good	17.9	18.4	calm	0,3 m		no
				12:58	03:00		43	24.903	7	47.834	CIMEL 4	Tau atmos.		blue	far Cu	2			1019.7								
				13:32	02:00		43	28.000	7	42.000	CIMEL 5	Tau atmos.		blue	far Cu	2			1019.7								
			CTDBOUS004	13:55	26:00	400	43	27.902	7	42.338				blue	far Cu	3	6 kn	200	1019.4	69	very good	18.6	18.6	calm	0,3 m		no
			CTDBOUS005	14:59	26:00	400	43	30.909	7	36.846				blue	far Cu	5	4 kn	188	1019.4	79	very good	17.9	17.0	calm	0,3 m		no
			CTDBOUS006	16:02	25:00	400	43	33.917	7	30.798				blue	far Cu	5	8 kn	195	1019.3	78	very good	19.6	20.2	calm	0,3 m		no
			CTDBOUS007	17:04	25:00	400	43	37.400	7	24.797				blue	far Cu	4	2 kn	52	1019.4	76	very good	18.9	20.7	quite flat	0,2 m		no
			CTDBOUS008	08:19	29:00	400	43	21.972	7	53.772				milky	few	2	2 kn	263	1022.9	82	very good	18.5	18.6	calm	0,4 m		no
				08:24	04:00		43	22.000	7	54.000	CIMEL 6	Tau atmos.		milky	few	2			1023.0								
				09:48	03:00		43	22.000	7	54.000	CIMEL 7	Tau atmos.		milky	few	2			1023.2								
	bou091005black1			10:15	03:00																						
		bou091005spmratsurfaceAA		10:26	08:48	200	43	22.000	7	54.000				milky	few	2	1 kn	-	1023.1	71	very good	19.3		calm	0,5 m		no
				10:34	04:00		43	22.000	7	54.000	CIMEL 8	Tau atmos.		milky	few	2			1023.2								
		bou091005AB		10:45	05:59	200	43	22.000	7	54.000				milky	few	2	1 kn	-	1023.1	71	very good	19.3		calm	0,5 m		no
		bou091005spmratsurfaceAC		11:01	07:26	200	43	22.000	7	54.000				milky	few	2	1 kn	-	1023.1	71	very good	19.3		calm	0,5 m		no
09/10/2005				11:09	04:00		43	22.000	7	54.000	CIMEL 9	Tau atmos.		milky	few	2			1023.3								
		bou091005spmratsurfaceAD		11:26	06:38	200	43	22.000	7	54.000				milky	few	2	1 kn	-	1023.1	71	very good	19.3		calm	0,5 m		no
	bou091005black2			11:54	03:00																						
			CTDBOUS009	11:55	29:00	400	43	22.030	7	53.690				milky	few	2	2 kn	281	1022.9	69	very good	19.6	18.7	quite flat	0,3 m		no
				12:00	05:00		43	22.030	7	53.690	Secchi 1	turbidity															
				12:13	05:00		43	22.000	7	54.000	CIMEL 10	Tau atmos.		milky	few	2			1023.0								
				12:19	04:00		43	22.000	7	54.000	CIMEL 11	Tau atmos.		milky	few	2			1022.9								
				12:48	03:00		43	23.000	7	50.000	CIMEL 12	Tau atmos.		milky	few	2			1022.4								
				13:26	03:00		43	27.000	7	43.000	CIMEL 13	Tau atmos.		milky	few	2			1022.2								



GMT 2005 Oct 12 16:39:37

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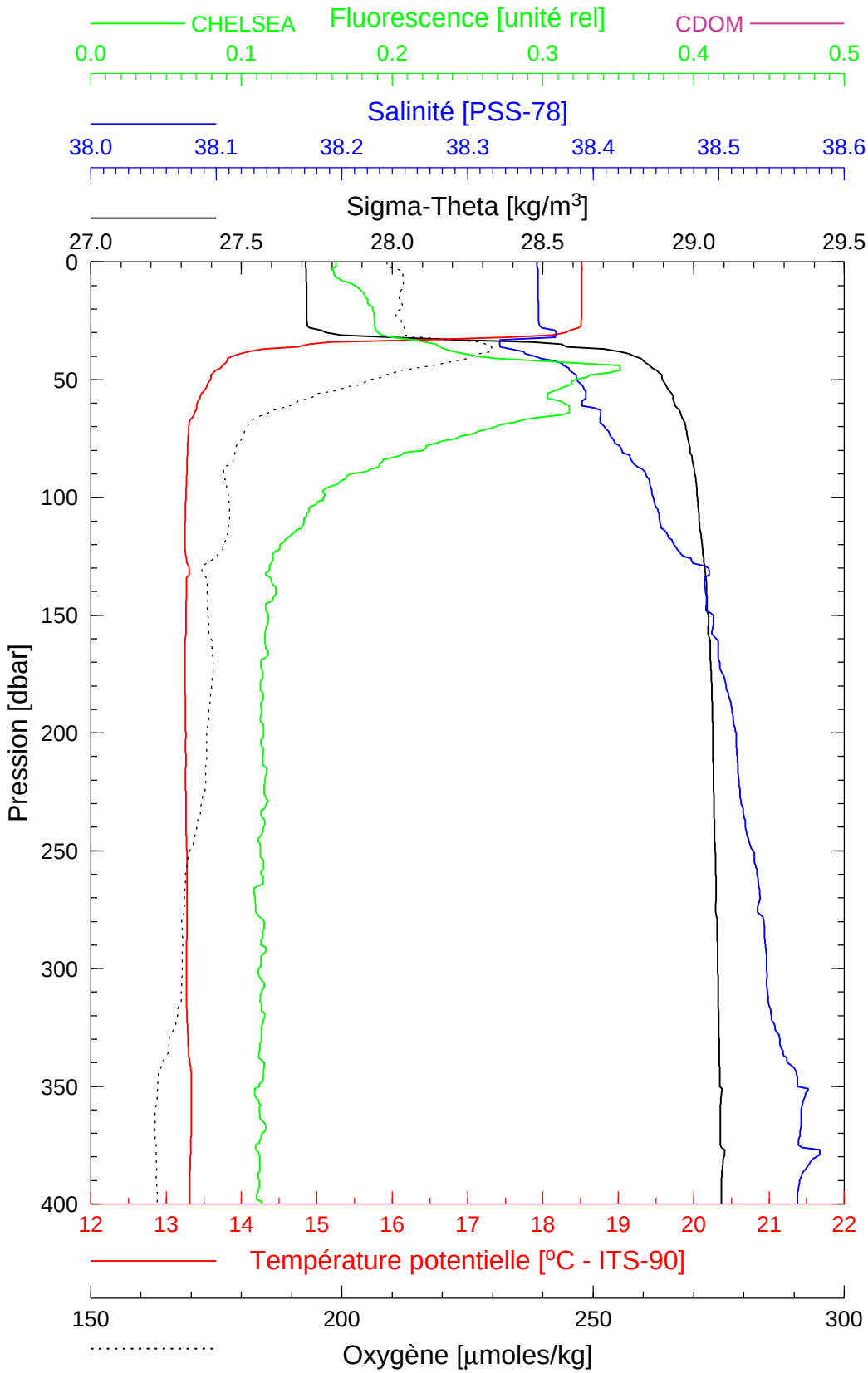

Date *08/10/2005* *Latitude* *43º21.976 N*

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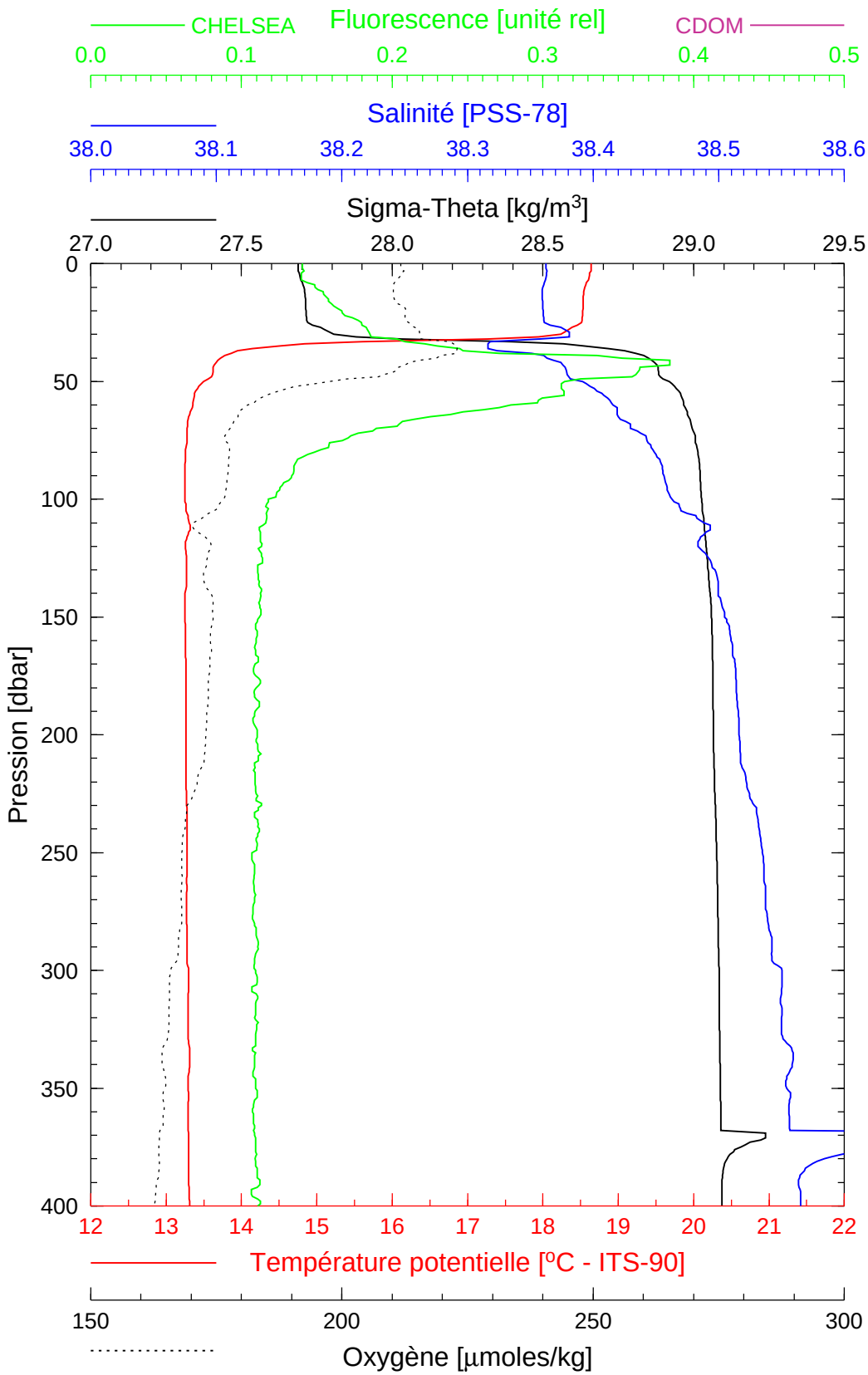
Boussole 46 **08/10/2005** **BOUS051008_02**

BOUS002



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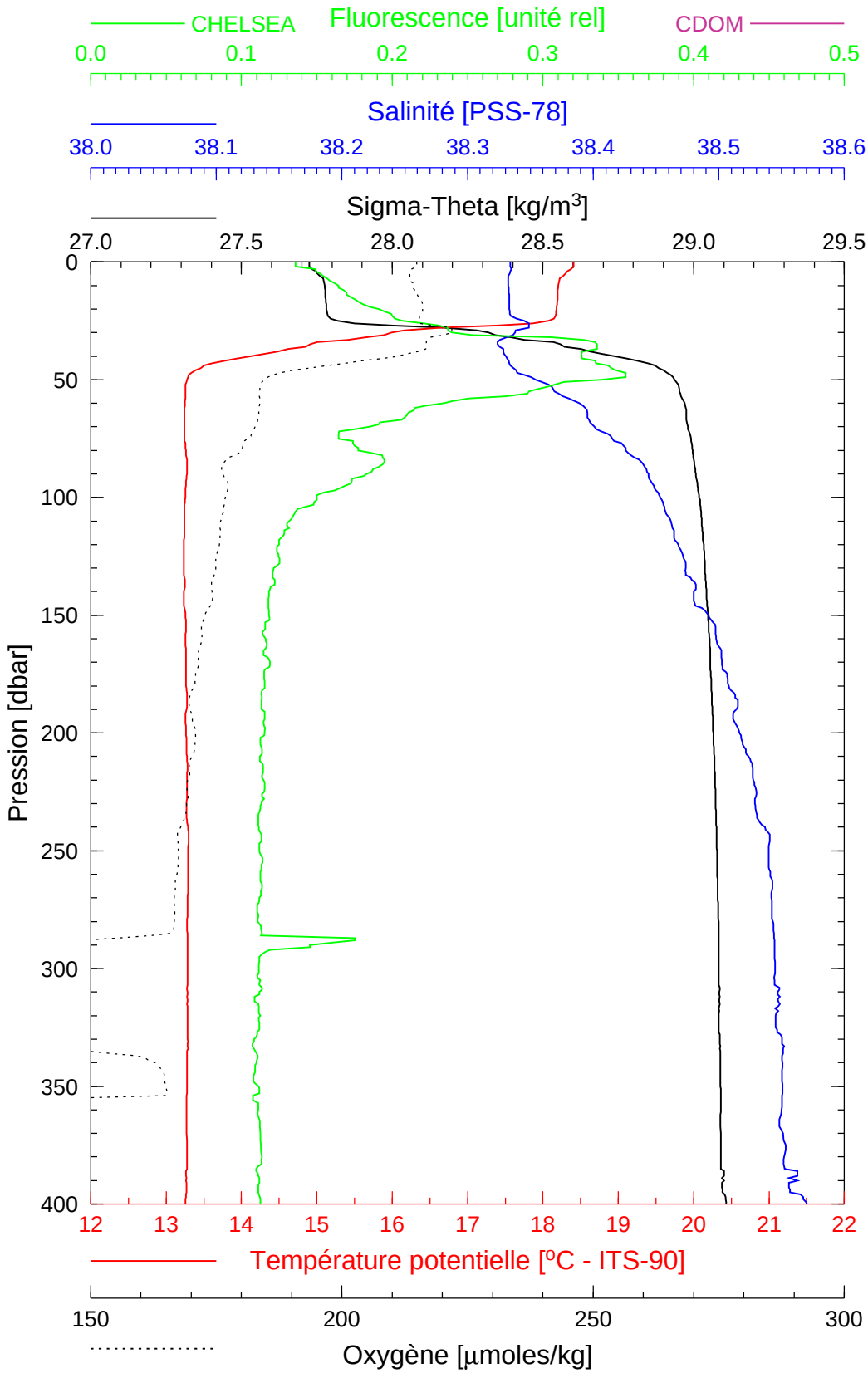

Date *08/10/2005* *Latitude* *43°24.903 N*

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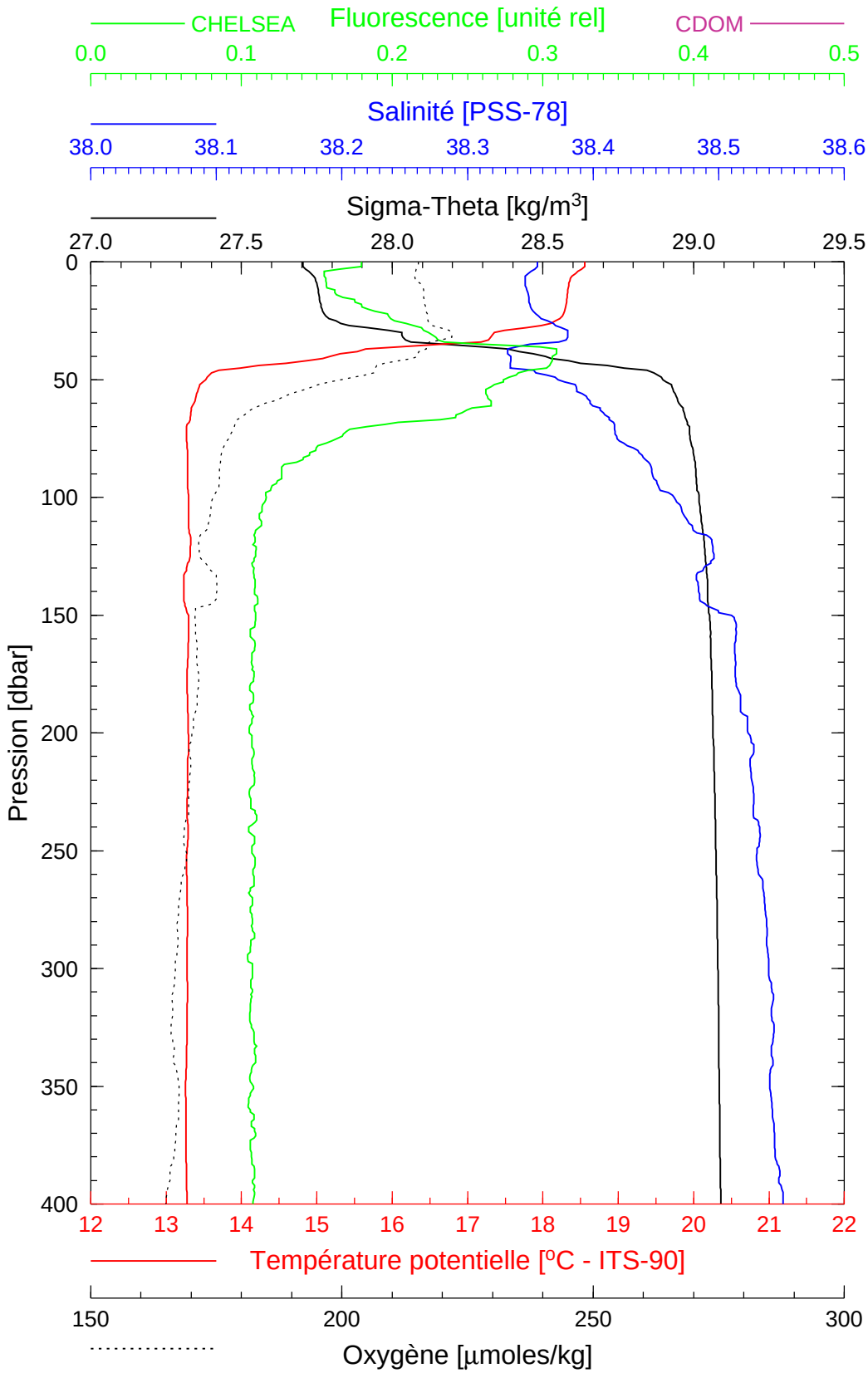

Date *08/10/2005* *Latitude* *43º27.902 N*

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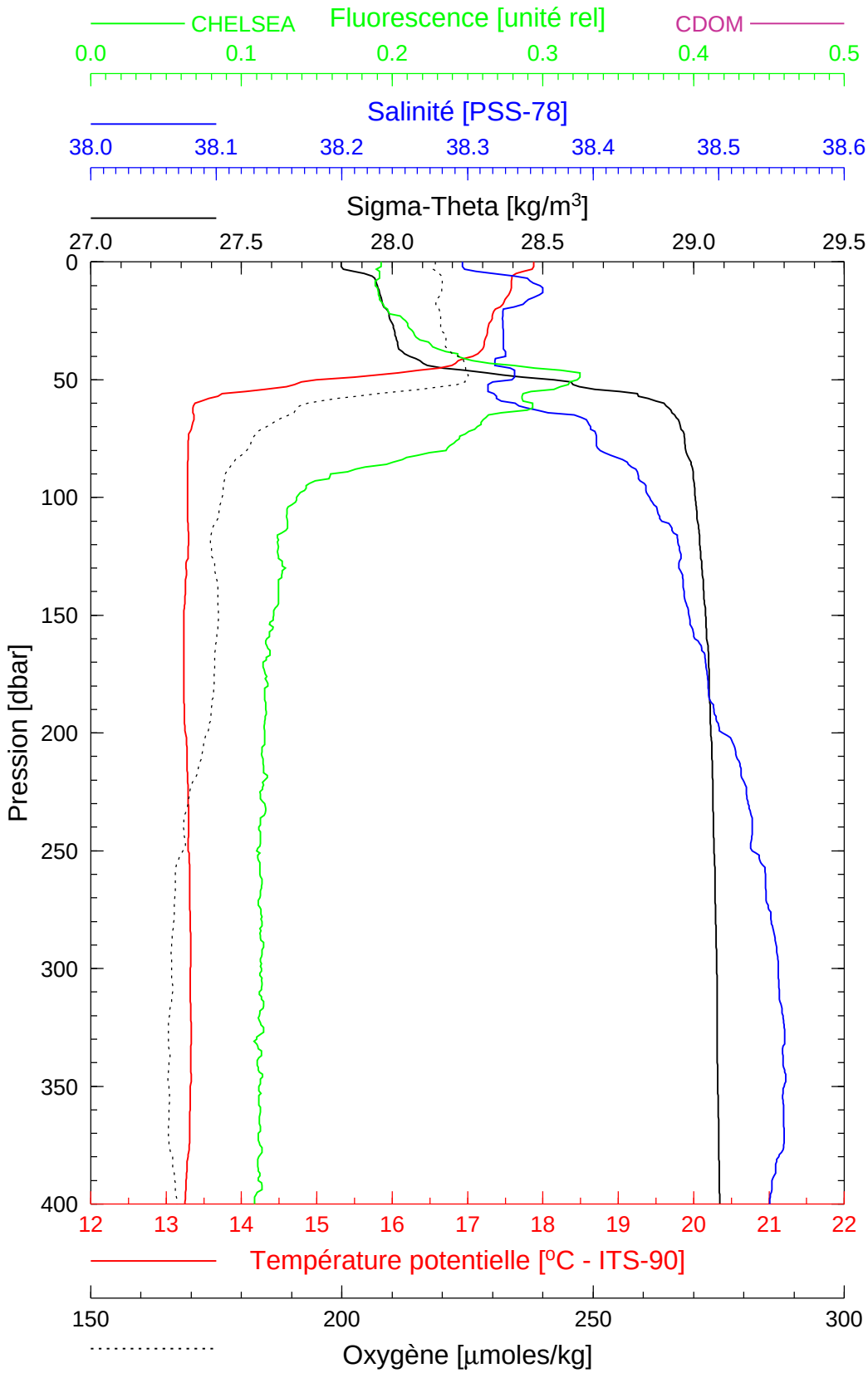

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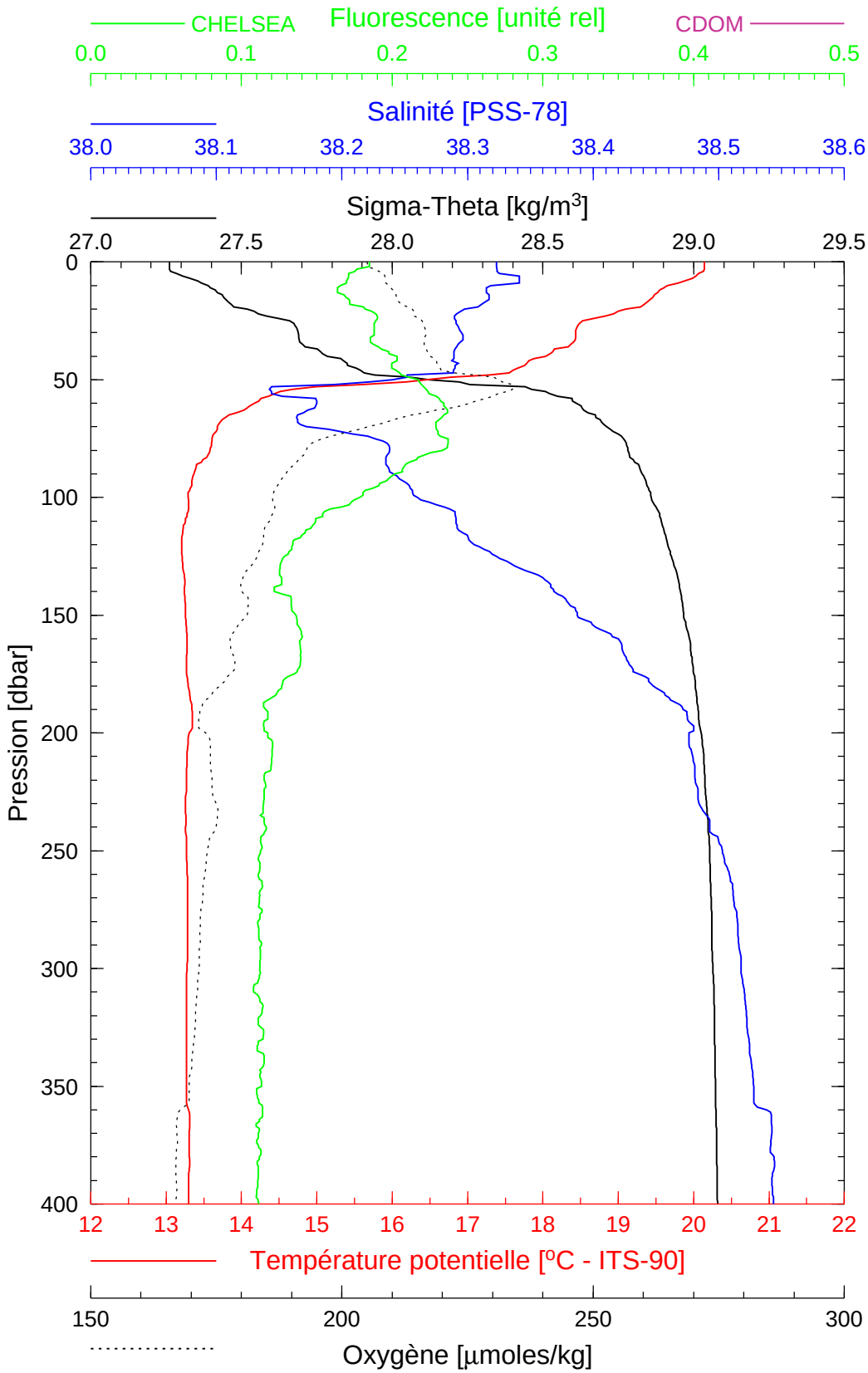

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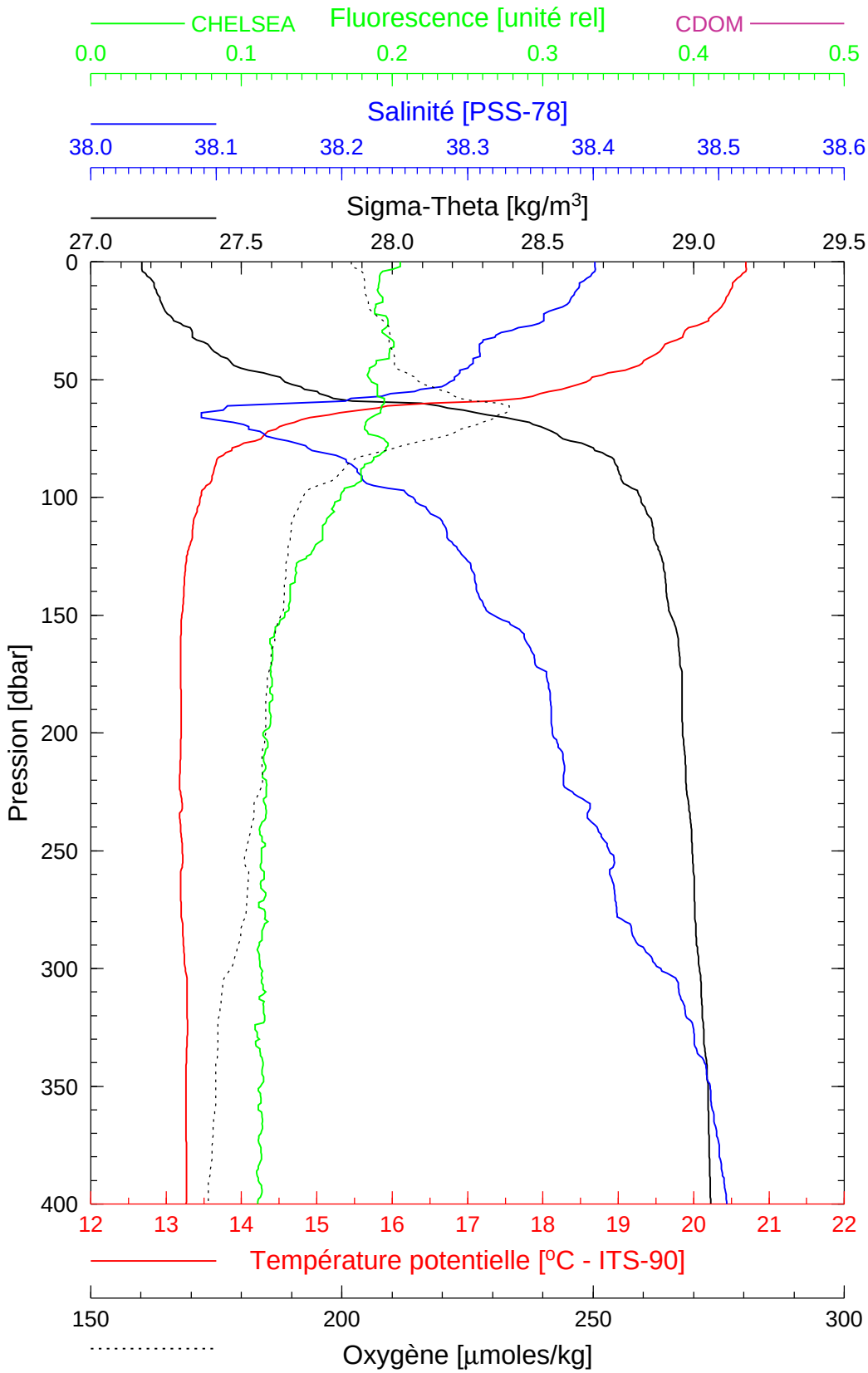

Date *08/10/2005* *Latitude* *43°37.400 N*

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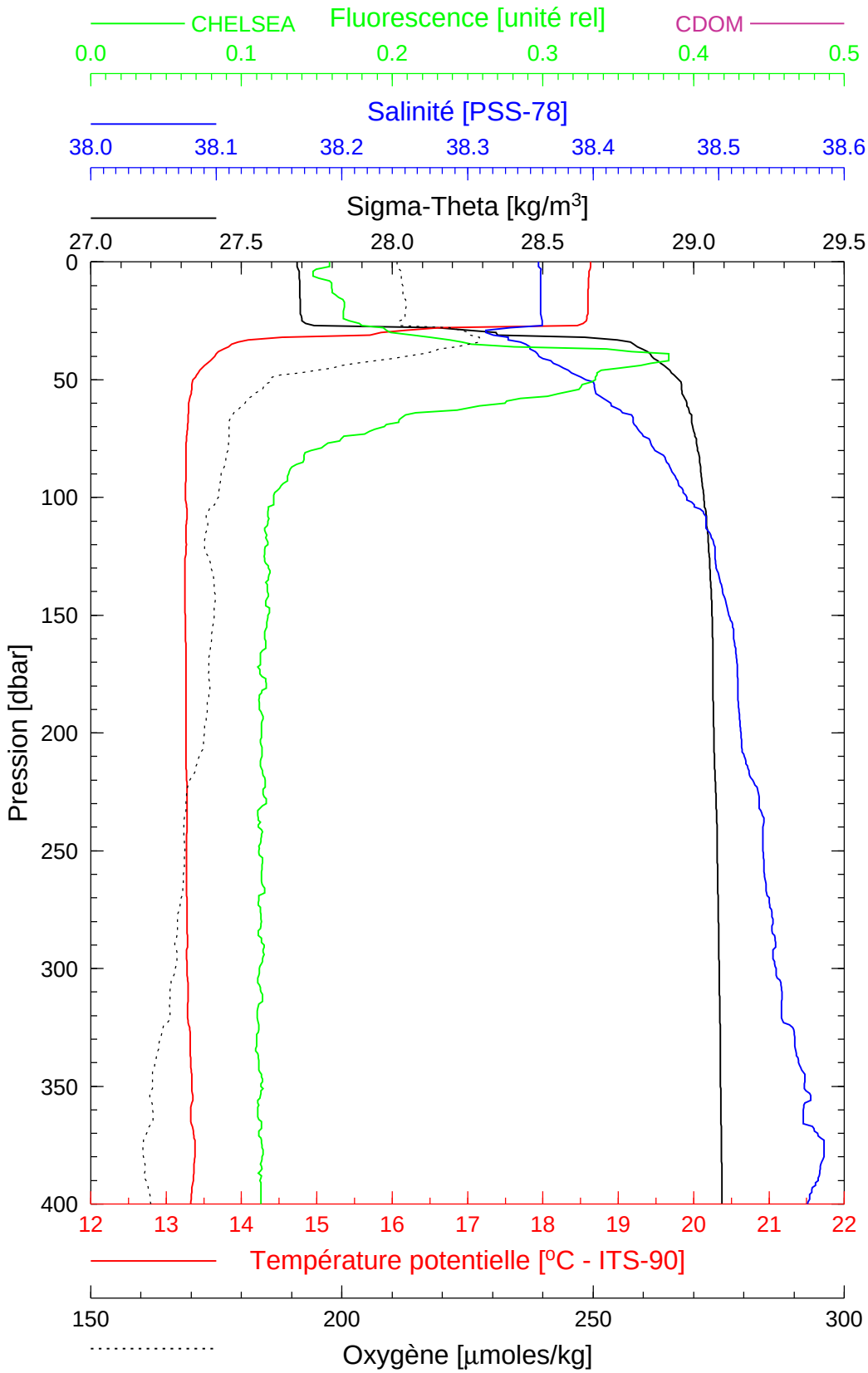

Date *09/10/2005* *Latitude* *43º21.972 N*

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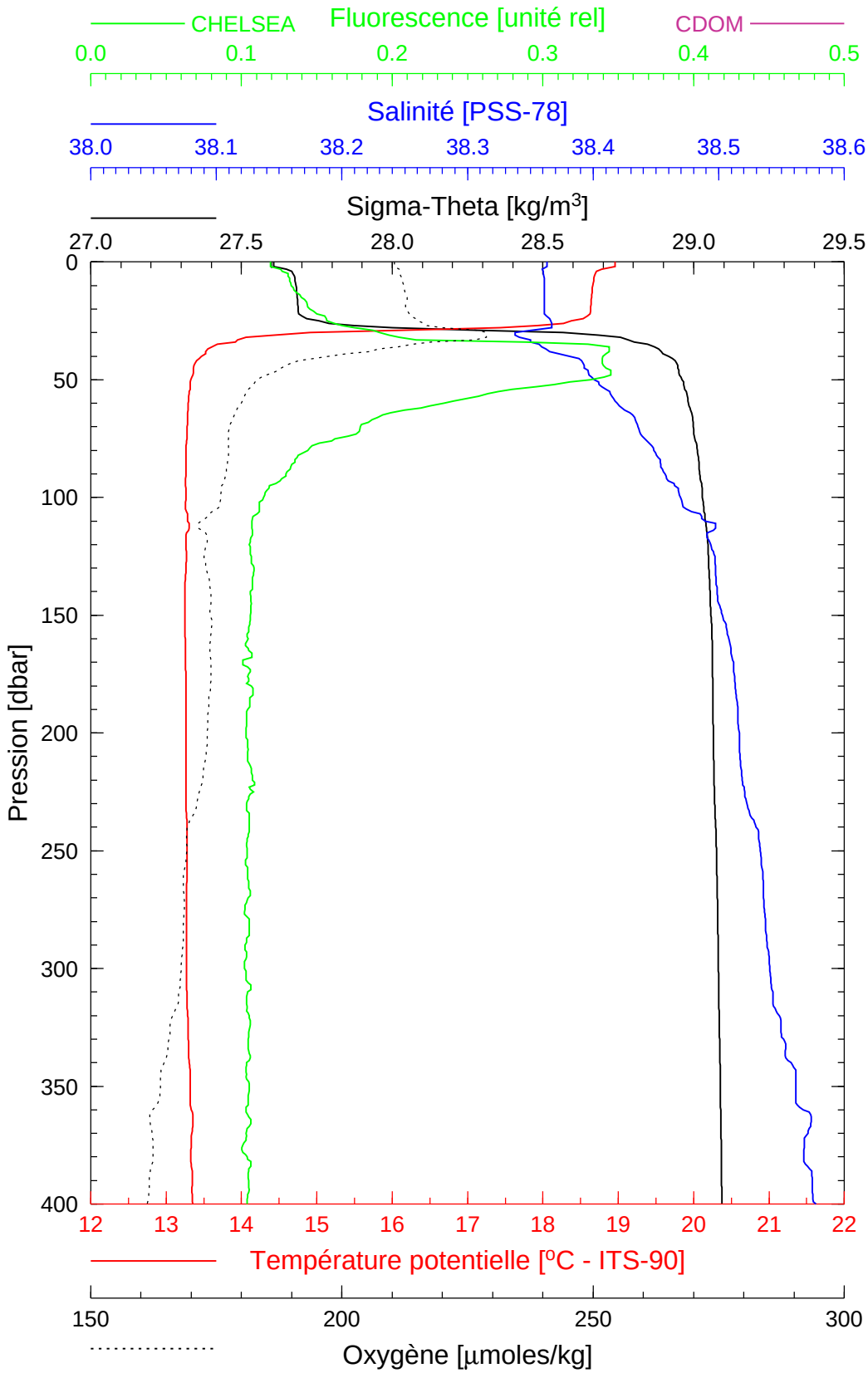

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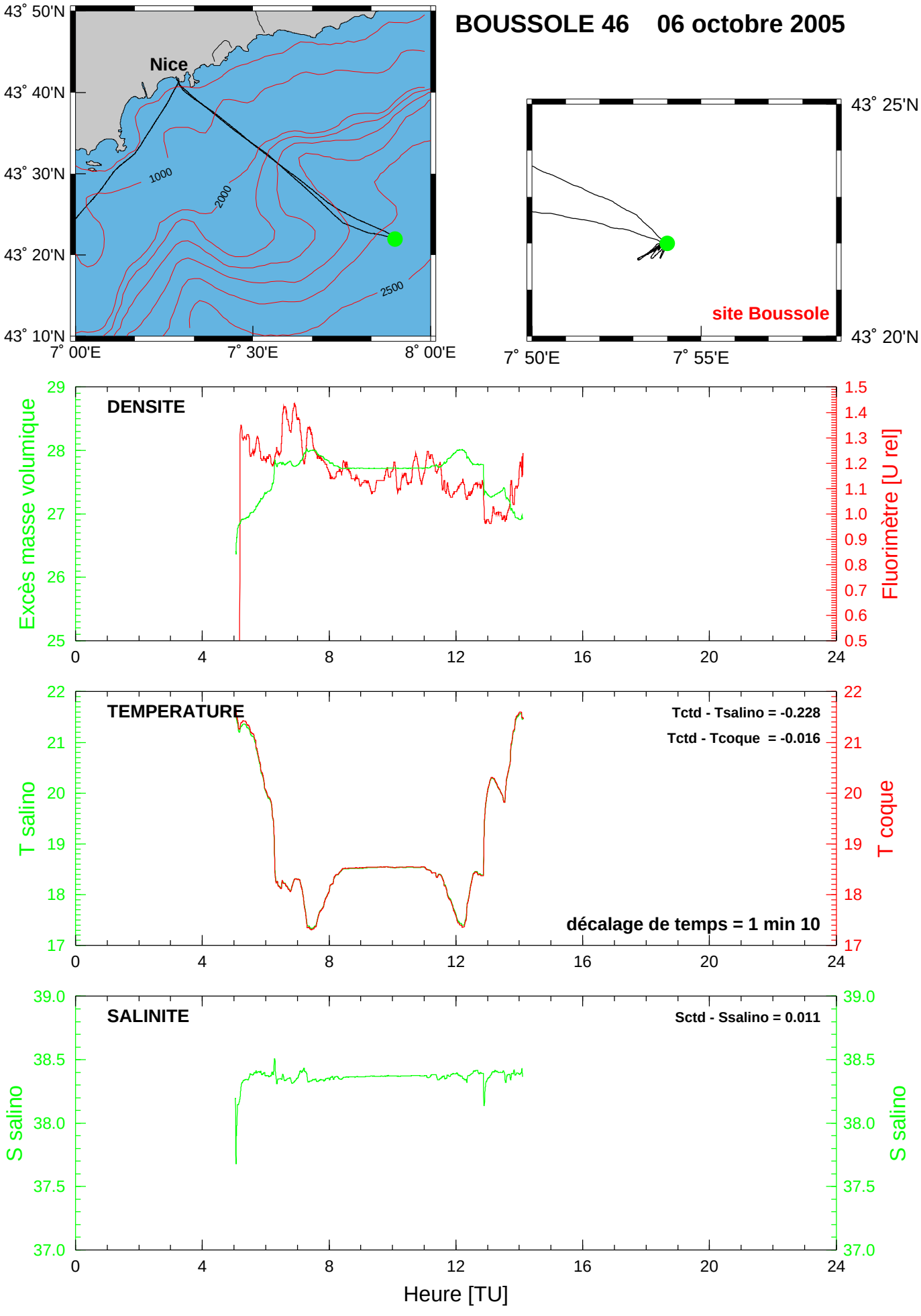
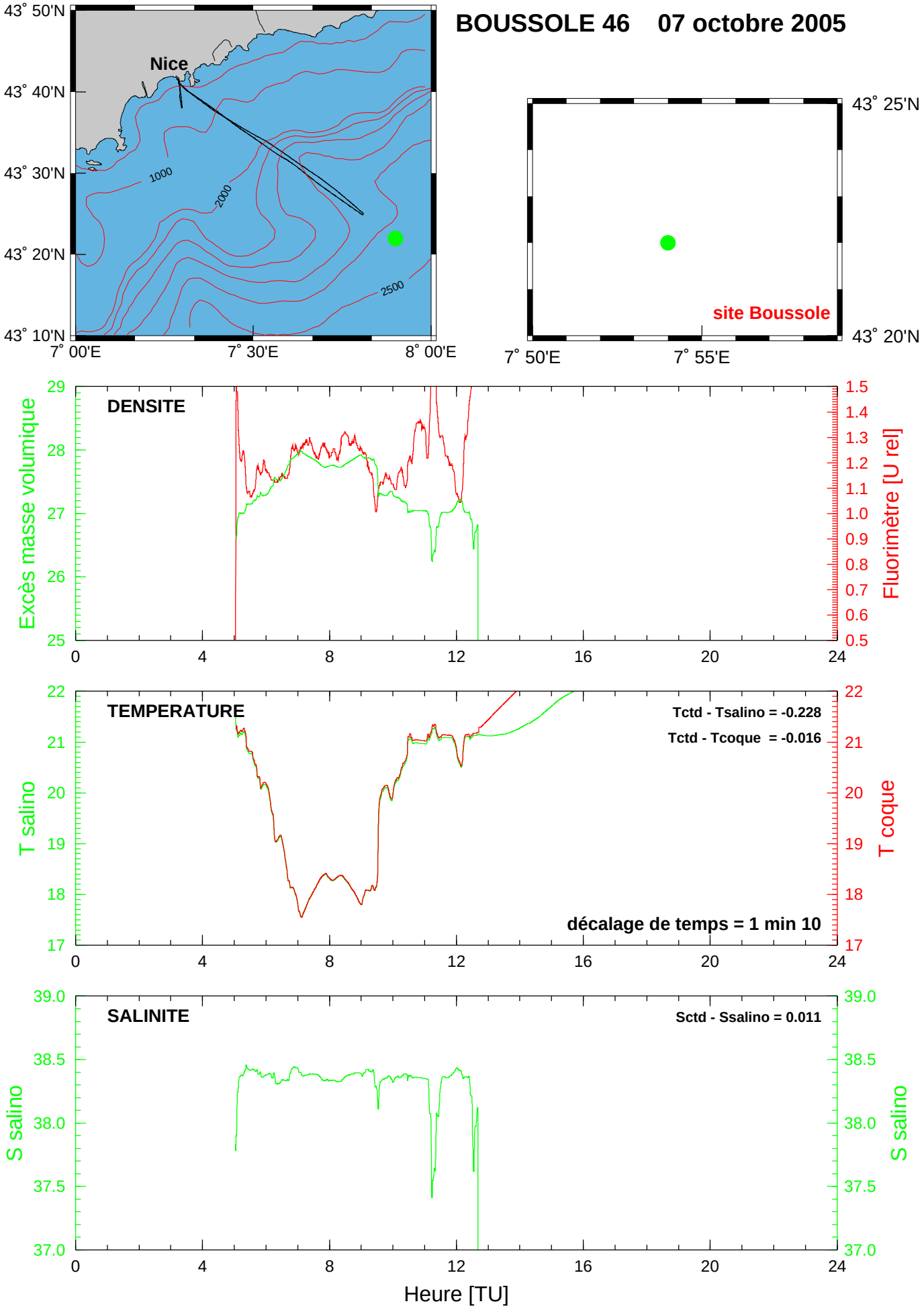
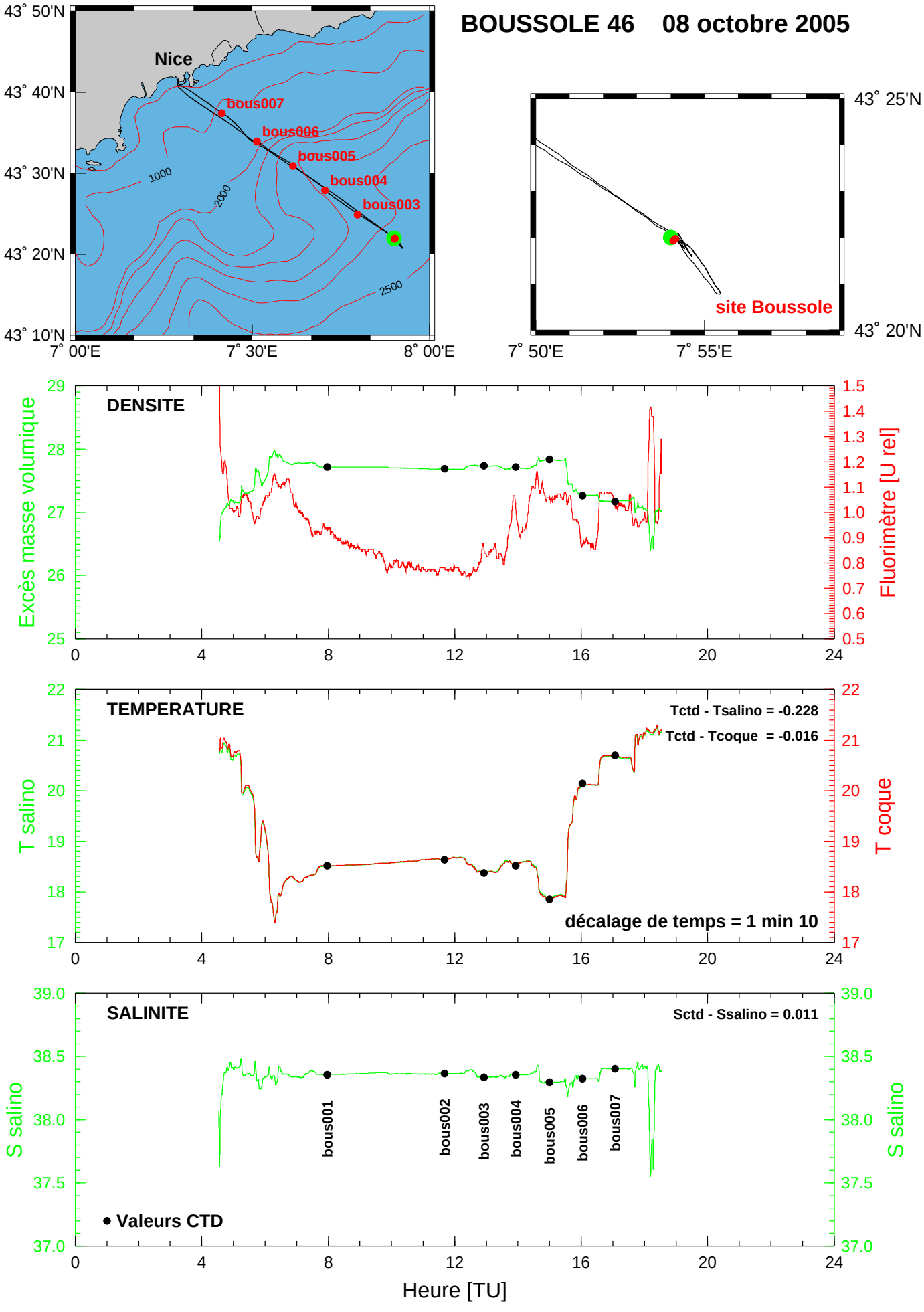

BOUSSOLE 46 06 octobre 2005
Nice
43° 50'N
43° 40'N
43° 30'N
43° 20'N
43° 10'N
7° 00'E
7° 30'E
8° 00'E
1000
2000
2500
43° 25'N
43° 20'N
7° 50'E
7° 55'E
site Boussole
DENSITE
Excès masse volumique
Fluorimètre [U rel]
TEMPERATURE
Tctd - Tsalino = -0.228
Tctd - Tcoque = -0.016
T salino
T coque
décalage de temps = 1 min 10
SALINITE
Sctd - Ssalino = 0.011
S salino
Heure [TU]


BOUSSOLE 46 07 octobre 2005
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 = -0.228
Tctd - Tcoque = -0.016
T salino
T coque
décalage de temps = 1 min 10
SALINITE
Sctd - Ssalino = 0.011
S salino
Heure [TU]


BOUSSOLE 46 08 octobre 2005
Nice
bous007
bous006
bous005
bous004
bous003
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2000
2500
43° 50'N
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43° 30'N
43° 20'N
43° 10'N
7° 00'E
7° 30'E
8° 00'E
site Boussole
43° 25'N
43° 20'N
7° 50'E
7° 55'E
DENSITE
Excès masse volumique
Fluorimètre [U rel]
TEMPERATURE
Tctd - Tsalino = -0.228
Tctd - Tcoque = -0.016
T salino
T coque
décalage de temps = 1 min 10
SALINITE
Sctd - Ssalino = 0.011
S salino
bous001
bous002
bous003
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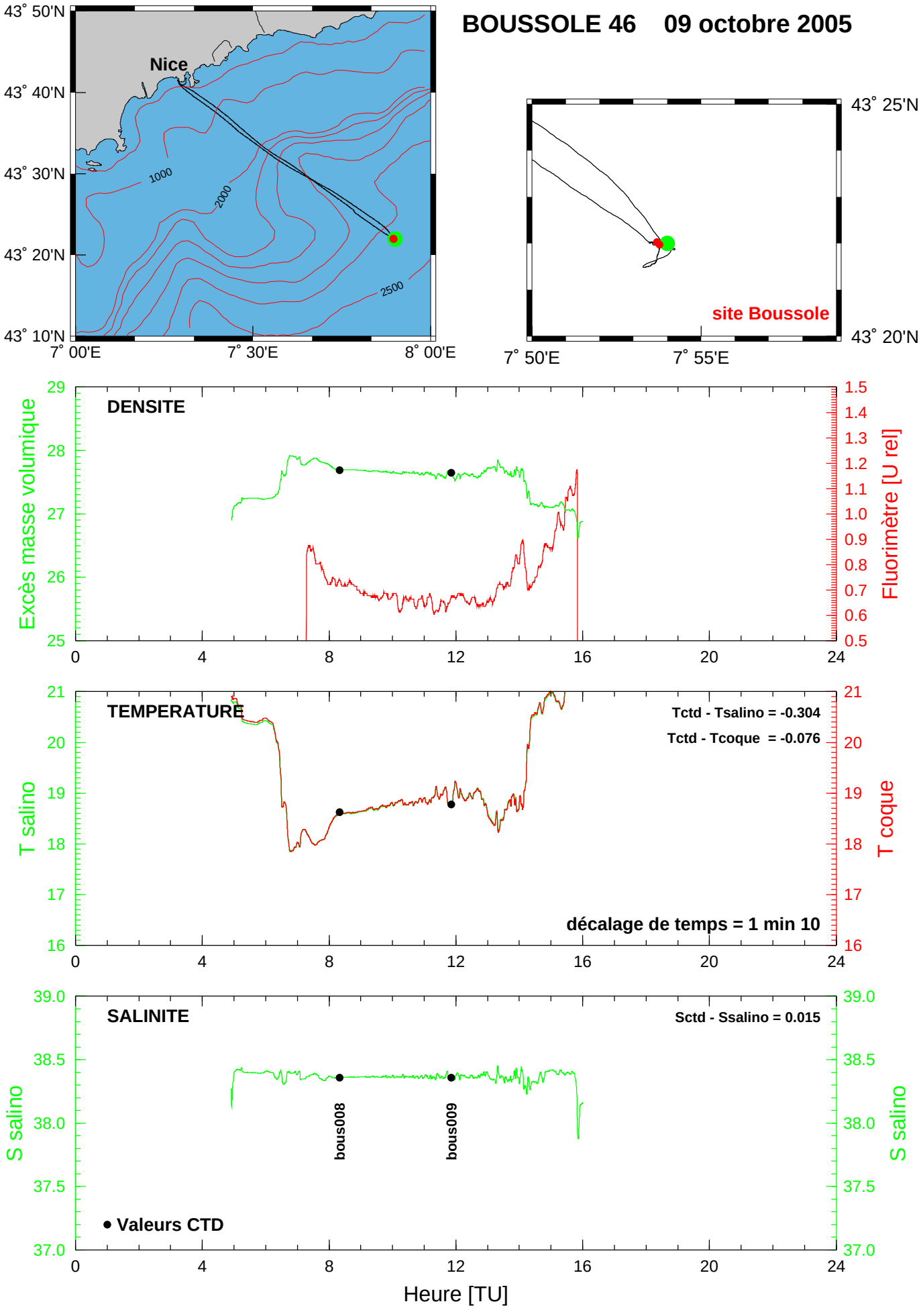
• Valeurs CTD
Heure [TU]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Nice
43° 50'N
43° 40'N
43° 30'N
43° 20'N
43° 10'N
7° 00'E
7° 30'E
8° 00'E
1000
2000
2500
43° 25'N
43° 20'N
7° 50'E
7° 55'E
site Boussole
DENSITE
Excès masse volumique
Fluorimètre [U rel]
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T salino
T coque
décalage de temps = 1 min 10
SALINITE
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bous008
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• Valeurs CTD
Heure [TU]