BOUSSOLE Monthly Cruise Report

Cruise 47
November 05 – 08, 2005

Duty Chief: Guislain Bécu (guislain.becu@obs-vlfr.fr)
Vessel: R/V Téthys II
(Captain: Dany Deneuve)

Science Personnel: Guislain Bécu, Dominique Tailliez, Fanny Tièche, Fabrizio D'Ortenzio and 3 divers (Laurent Giletta, Jean de Vaugelas and Fabrice Javel)

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

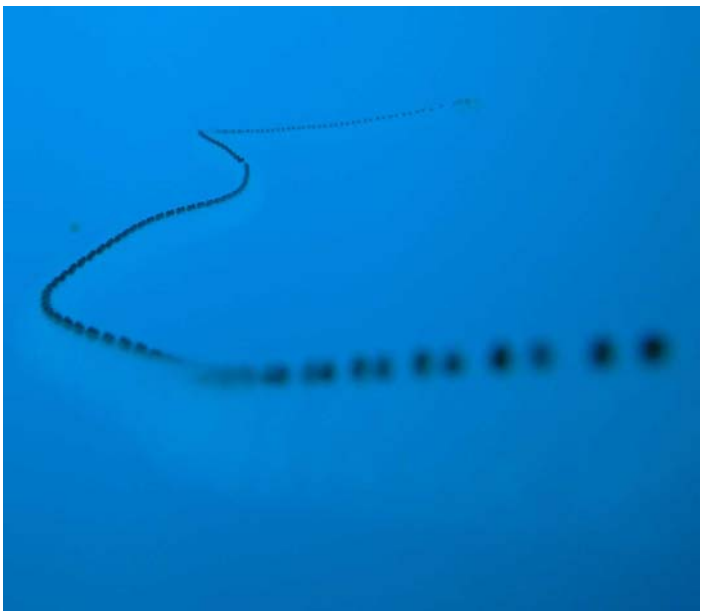


Fig 1. Salps chain seen close to the buoy.

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 divers (Laurent Giletta, Jean de Vaugelas and Fabrice Javel) will be onboard on 07 November 2005 to take some pictures and clean and check the buoy structure under the sea surface.

Fanny Tièche will be present on 08 November for the Ultra Path water sampling/filtration and for a Kishino set of filtration.

A dry weight operation will be attempted once a day from this cruise, and will be performed (once a day) for the future cruises.

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

The weather conditions were very good for this period of year, allowing the ship to leave the port of Nice each of the four cruise day. The sea was a little bit agitated the two first days, with cloudy sky, but it was summer conditions for the two last days, with blue sky.

There was a lot of zooplankton in water, some salps or other species being regularly glued to the CTD structure when recovered on the deck.

There was also a recurrent problem with CTD CDOM, temperature and oxygen sensors. It was attributed to the important amount of zooplankton, but the problem appeared quite always at about 50-100 meters depth when the CTD was ascending, which could not be explained with zooplankton only…

The buoy node software was updated to correct a little bug that was preventing the “dark” schedule to record data every hour during the night. Until then, only a “light” schedule starting at 00h15 UTC and ending at 23h45 UTC was configured in the node software, but this lead to a great amount of data that are not so essential during the night.

Saturday 05 November 2005

The sea was a little bit agitated this day, with a cloudy gray sky. Nevertheless, it was possible to deploy the CTD, and 7 profiles were performed, including 5 transect profiles. No SPMR profiles were realized, as there was

a lot a whitehorses. The first dry weight operation was attempted (triplicate), but there were some leak in the vacuum circuit, and it took 6 hours to filter 5.6 litres, which is far too much.
The buoy node software was updated to take account of the dark schedule.

Sunday 06 November 2005

The sea was a little bit calmer for this day, which allowed realizing 2 series of 3 SPMR profiles. 2 CTD profiles were also performed.

Monday 07 November 2005

Sea and sky conditions were very good, even summer like for this day. 3 SPMR profiles (with floating system), 2 CIMEL measurements and 1 CTD profile were realized after the divers have been at sea. Guislain BECU cleaned the ARGOS beacon contacts, as it had stop emitting daily messages. After cleaning, the beacon re-emitted messages, which incite to clean the contact once a month.
The dry weight filtration took this time between 3 and 3.5 hours, which is still a bit long. Vacuum circuit leak were clogged, but perhaps 5.6 litres are too much…

Tuesday 08 November 2005

Weather conditions were similar to the conditions of the previous day. 1 Secchi disk measurement, 6 CIMEL measurements, 5 SPMR profiles (with floating system) and 2 CTD were realized. For the dry weight operation, only 3.8 litres were filtered, which was better regarding time of filtration.

Cruise Report

05 November 2005 (UTC)

0545 Departure from port of Nice.
0919 CTD 1 with water sampling at 200, 100, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters.
1015 Buoy data uploading and node software upgrading (until 1230).
1232 CTD 2 with water sampling at 5 and 10 meters.
1431 CTD 3 at station 1 (43°25'N 07°48'E).
1532 CTD 4 at station 2 (43°28'N 07°42'E).
1632 CTD 5 at station 3 (43°31'N 07°37'E).
1731 CTD 6 at station 4 (43°34'N 07°31'E).
1831 CTD 7 at station 5 (43°37'N 07°25'E).
1930 Arrival at port of Nice.

06 November 2005

0530 Departure from port of Nice.
0900 CTD 8 with water sampling at 200, 100, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters.
1000 SPMR profiles 1, 2, 3.
1200 Connection to the buoy to check the dark schedule → OK.
1210 SPMR profiles 4, 5, 6.
1312 CTD 9 with water sampling at 5 and 10 meters.
1730 Arrival to port of Nice.

07 November 2005

0530 Departure from port of Nice.
0910 Divers at sea to check, clean and take pictures of the buoy underwater structure.
0945 CIMEL 1.
1200 SPMR profiles 7, 8, 9, 10 (7 and 8 are 1 profiles, as the SPMR got stuck in the floating system).
1330 ARGOS beacon electric contacts cleaning.
1402 CTD 10 with water sampling at 10 and 5 meters.
1404 CIMEL 2.
1114 CTD 11 with water sampling at 5 and 10 meters (triplicates).
1800 Arrival at port of Nice.

08 November 2005

0530 Departure from port of Nice.
0900 CTD 11 with water sampling at 200, 100, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters.
0904 CIMEL 3.
1005 SPMR profiles 11,12,13.
1155 CIMEL 4.
1200 SPMR profiles 14, 15.
1325 CTD 12 with water sampling at 5 and 10 meters.
1500 Arrival at port of Nice.

Calculated Swath paths for MERIS Sensor (ESOV Software)

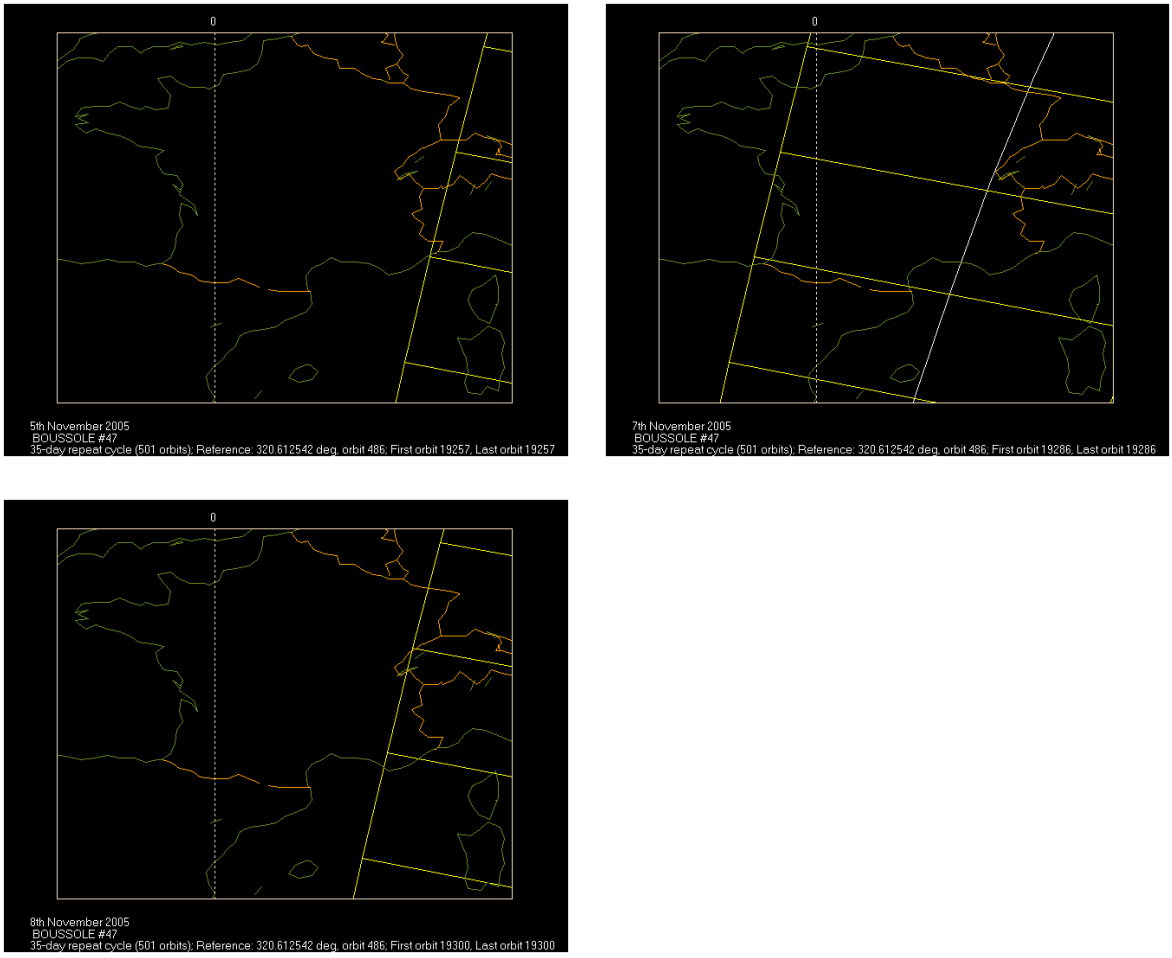
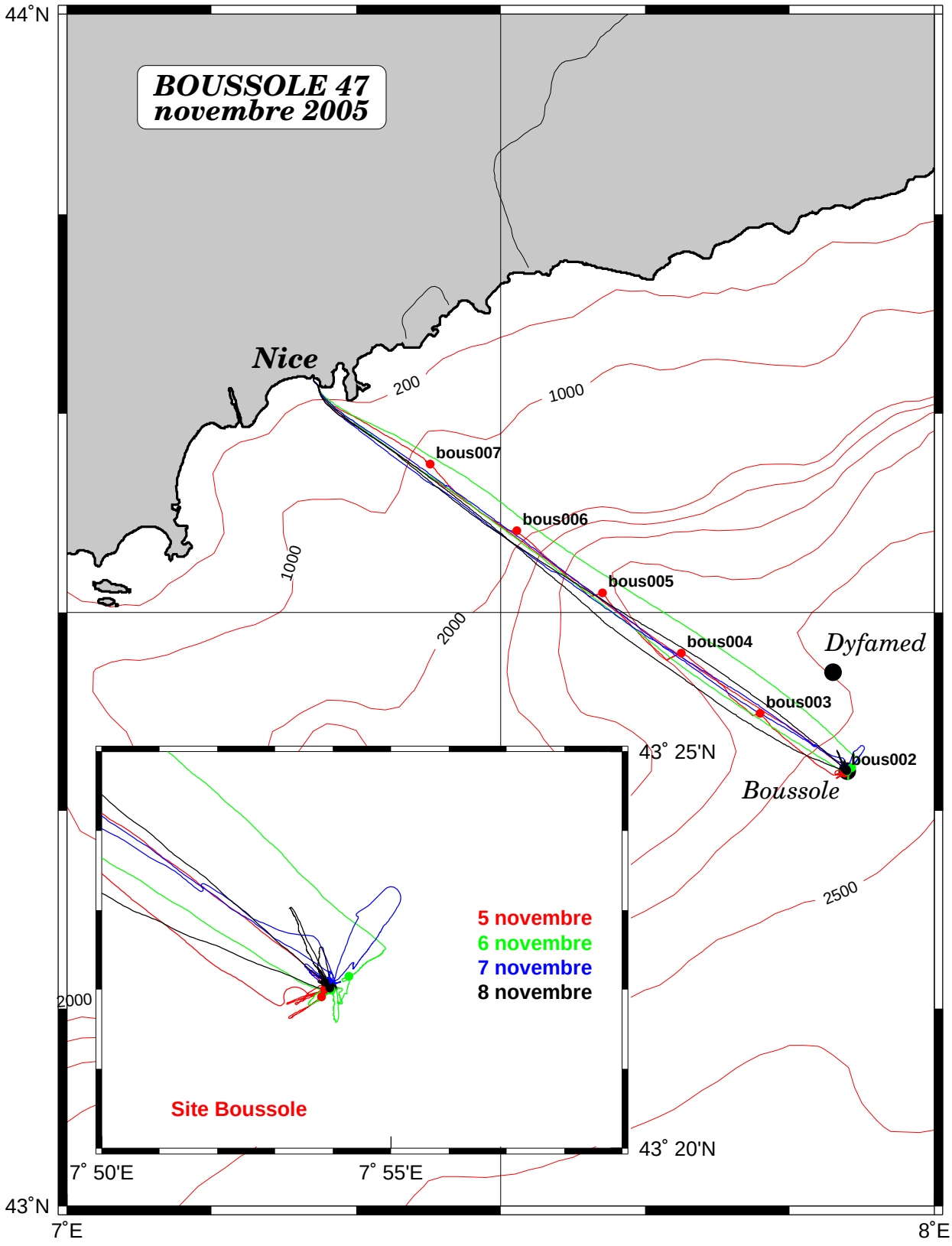


Figure 3. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for 05, 07 and 08 November 2005.

Appendix

Cruise Summary Table for Boussole 47

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	09:19	34:00	400	43	21.911	7	53.799				covered	heter.	8	14 kn	60	1019.9	85	very good	17.6	18.4	choppy	1,2 m		yes
			CTDBOUS002	12:32	29:00	400	43	21.999	7	53.852				covered	heter.	8	15 kn	62	1020.1	81	very good	18.0	18.4	choppy	1,2 m		yes
			CTDBOUS003	14:31	25:00	400	43	24.923	7	47.949				covered	heter.	8	13 kn	73	1020.3	79	very good	18.2	18.4	choppy	1,2 m		yes
05/11/2005			CTDBOUS004	15:32	26:00	400	43	27.947	7	42.491				covered	heter.	8	16 kn	85	1019.9	78	very good	18.0	19.3	choppy	1,1 m		yes
			CTDBOUS005	16:32	24:00	400	43	31.001	7	37.037				covered	heter.	8	12 kn	76	1020.5	74	very good	18.8	19.8	choppy	1,1 m		yes
			CTDBOUS006	17:31	26:00	400	43	34.072	7	30.990				covered	heter.	8	8 kn	90	1020.9	71	very good	21.2	19.7	choppy	1,1 m		yes
			CTDBOUS007	18:31	23:00	400	43	37.467	7	25.114				covered	heter.	5	7 kn	109	1021.2	71	very good	19.1	19.8	choppy	1,1 m		yes
			CTDBOUS008	09:06	25:00	400	43	21.998	7	53.969				covered	Cu/Ci	5	1 kn	325	1021.5	70	very good	19.1	18.4	choppy	0,9 m		no
	bou061105black1			09:44	03:00																					
	bou061105black2			09:48	03:00																					
		bou061105AA		09:59	04:18	200	43	22.022	7	53.893				cloudy	heter.	5	10 kn	295	1021.6	73	very good	18.6		choppy	1,2 m		no
		bou061105AB		10:09	03:43	170	43	21.973	7	53.767				cloudy	heter.	5	10 kn	295	1021.6	73	very good	18.6		choppy	1,2 m		no
		bou061105AC		10:18	03:37	170	43	21.921	7	53.674				cloudy	heter.	5	10 kn	295	1021.6	73	very good	18.6		choppy	1,2 m		no
06/11/2005	bou061105black3			10:30	03:00																					
			CTDBOUS009	13:12	29:00	400	43	22.168	7	54.274				covered	Cu/Ci	4	13 kn	210	1021.2	76	very good	18.2	18.6	choppy	0,9 m		some
	bou061105black4			12:08	03:00																					
		bou061105AD		12:16	04:19	200	43	21.963	7	54.103				cloudy	heter.	4	11 kn	249	1021.3	69	very good	19.5		choppy	1 m		no
		bou061105AE		12:28	04:36	170	43	21.830	7	54.091				cloudy	heter.	4	11 kn	249	1021.3	69	very good	19.5		choppy	1 m		no
		bou061105AF		12:40	04:45	170	43	21.932	7	54.195				cloudy	heter.	4	11 kn	249	1021.3	69	very good	19.5		choppy	1 m		no
	bou061105black5			12:54	03:00																					
				09:45	03:00		43	22.000	7	54.000	CIMEL 1	Tau atmos.		blue	far Ci	1			1024.5								
	bou071105black1			12:03	03:00																					
		bou071105spmratsurfaceAA		12:10	06:03	10	43	22.204	7	53.972				blue	far Ci	1	6 kn	207	1024.5	74	excellent	17.8		calm	0,3 m		no
		bou071105spmratsurfaceAB		12:23	07:16	200	43	22.097	7	53.879				blue	far Ci	1	6 kn	207	1024.5	74	excellent	17.8		calm	0,3 m		no
07/11/2005		bou071105spmratsurfaceAC		12:44	07:51	200	43	22.181	7	53.665				blue	far Ci	1	6 kn	207	1024.5	74	excellent	17.8		calm	0,3 m		no
		bou071105spmratsurfaceAD		13:07	08:35	200	43	22.097	7	53.860				blue	far Ci	1	6 kn	207	1024.5	74	excellent	17.8		calm	0,3 m		no
	bou071105black2			13:28	03:00																					
			CTDBOUS010	14:02	28:00	400	43	22.106	7	53.920				blue	far Ci	1	6 kn	228	1024.6	73	excellent	18.2	18.4	calm	0,5 m		no
				14:04	01:00		43	22.000	7	54.000	CIMEL 2	Tau atmos.		blue	far Ci	1			1024.6								
			CTDBOUS011	09:00	29:00	400	43	22.021	7	53.948				blue	far haze	2	5 kn	85	1027.9	79	excellent	17.9	18.2	calm	0,3 m		no
				09:04	02:00		43	22.000	7	54.000	CIMEL 3	Tau atmos.		blue	plane trace	1			1028.0								
	bou081105black1			09:35	03:00																					
		bou081105spmratsurfaceAA		10:02	07:05	200	43	22.093	7	53.875				blue	few haze	1	4 kn	83	1028.1	77	excellent	18.2		calm	0,3 m		no
		bou081105spmratsurfaceAB		10:21	07:00	200	43	22.332	7	53.665				blue	few haze	1	4 kn	83	1028.1	77	excellent	18.2		calm	0,3 m		no
		bou081105spmratsurfaceAC		10:41	06:59	200	43	22.595	7	53.511				blue	few haze	1	4 kn	83	1028.1	77	excellent	18.2		calm	0,3 m		no
	bou081105black2			10:57	03:00																					
				11:58	03:00		43	22.000	7	54.000	CIMEL 4	Tau atmos.		blue	ship fume ?	1			1027.0								
08/11/2005	bou081105black3			11:53	03:00																					
		bou081105spmratsurfaceAD		12:01	07:10	200	43	22.000	7	54.000				blue	far Ci	2	3 kn	133	1026.9	74	excellent	18.3		calm	0,3 m		no
		bou081105spmratsurfaceAE		12:20	07:13	200	43	22.365	7	53.752				blue	far Ci	2	3 kn	133	1026.9	74	excellent	18.3		calm	0,3 m		no
	bou081105black4			12:37	03:00																					
				12:30	04:00		43	22.000	7	54.000	CIMEL 5	Tau atmos.		blue	Ci from 870	2			1026.7								
				12:56	04:00		43	22.000	7	54.000	CIMEL 6	Tau atmos.		blue	Ci from 936	2			1026.5								
				13:06	04:00		43	22.000	7	54.000	CIMEL 7	Tau atmos.		blue	blue	2			1026.4								
				13:28	04:00		43	22.000	7	54.000	CIMEL 8	Tau atmos.		blue	blue	2			1026.4								
			CTDBOUS012	13:25	27:00	400	43	22.097	7	53.861				blue	far haze	2	4 kn	155	1026.4	73	excellent	18.3	18.4	calm	0,3 m		no



GMT 2005 Nov 10 15:14:54

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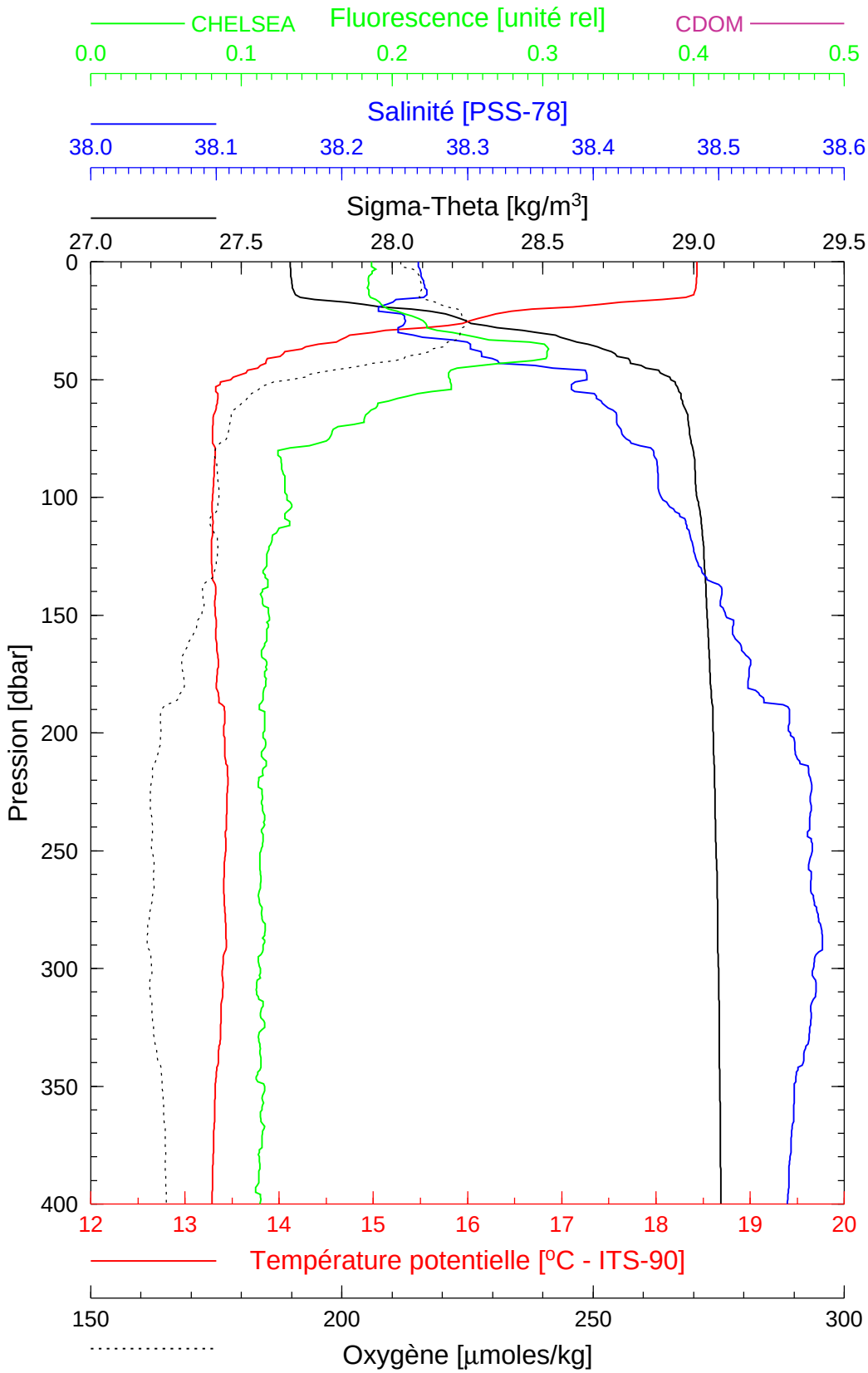
BOUS001



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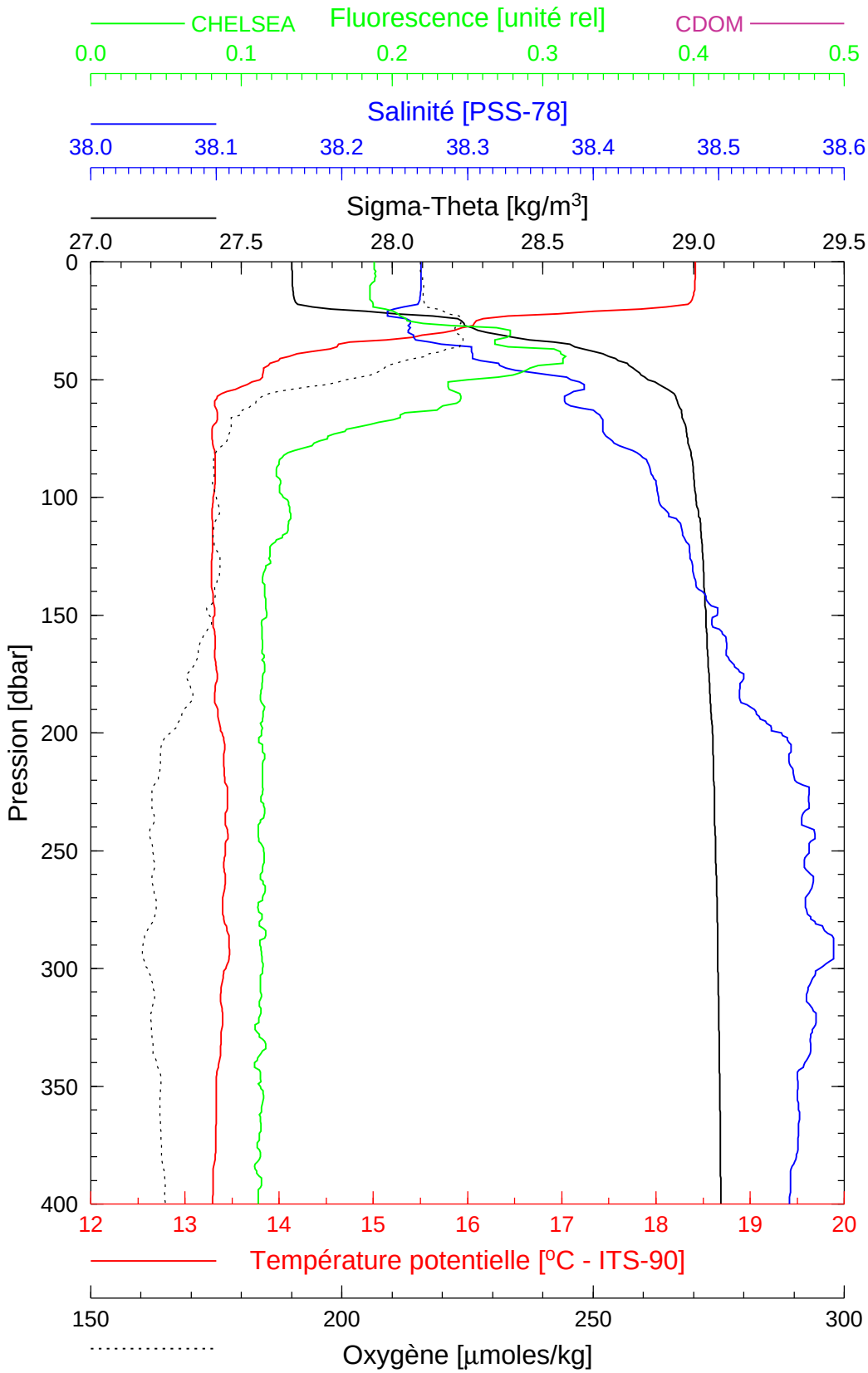
BOUS002



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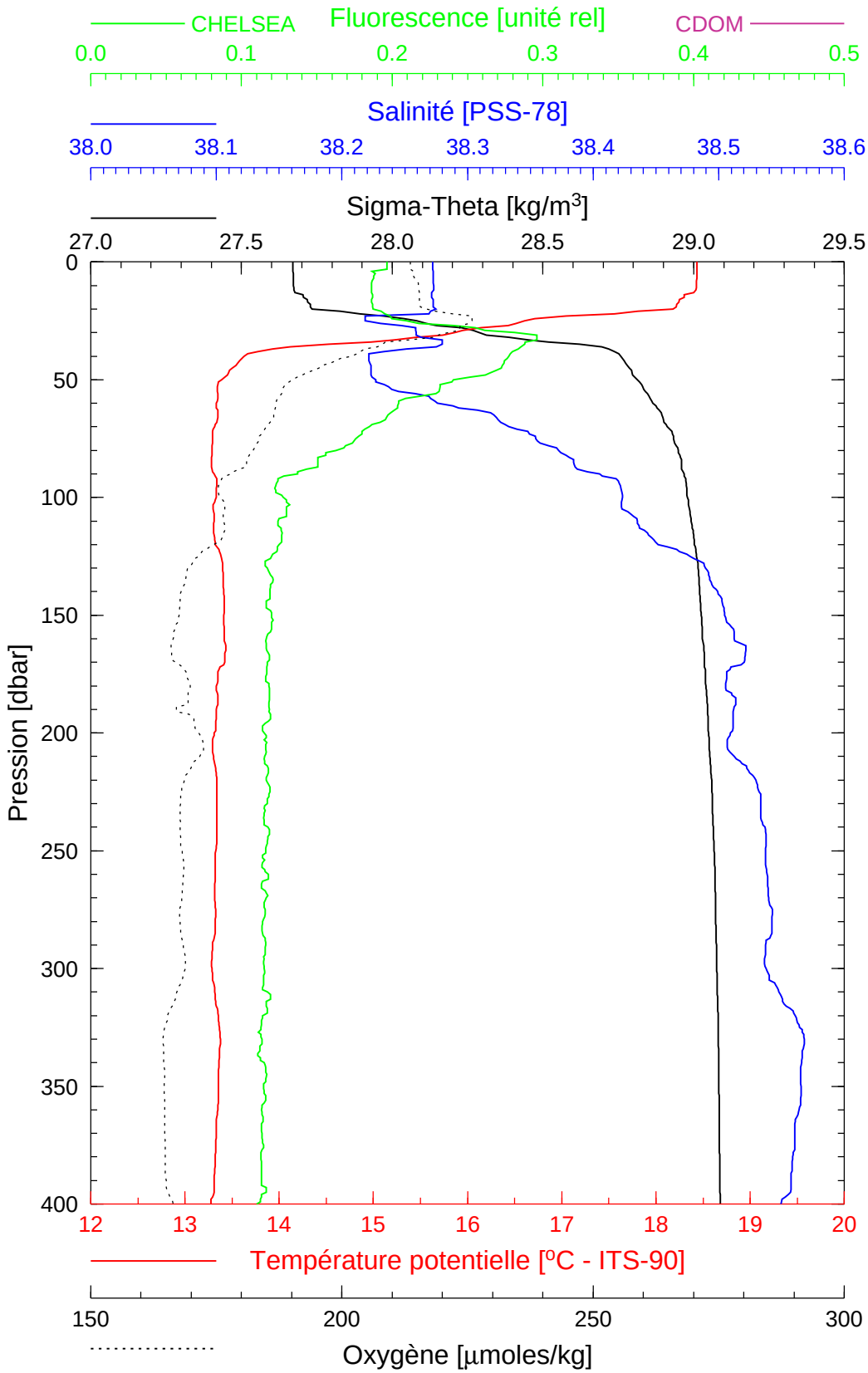
BOUS003



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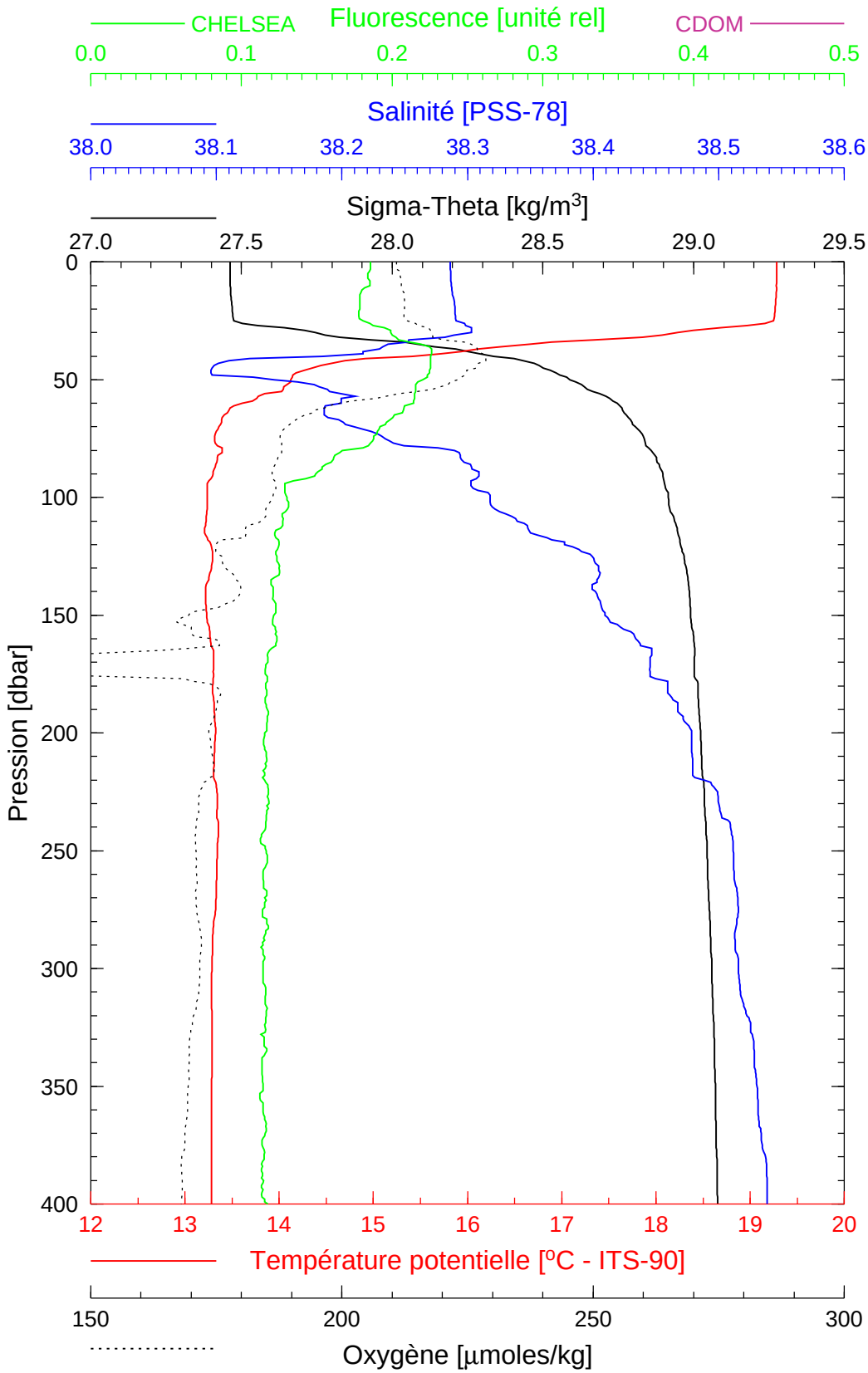
Boussole 47 **05/11/2005** **BOUS051105_04**

BOUS004



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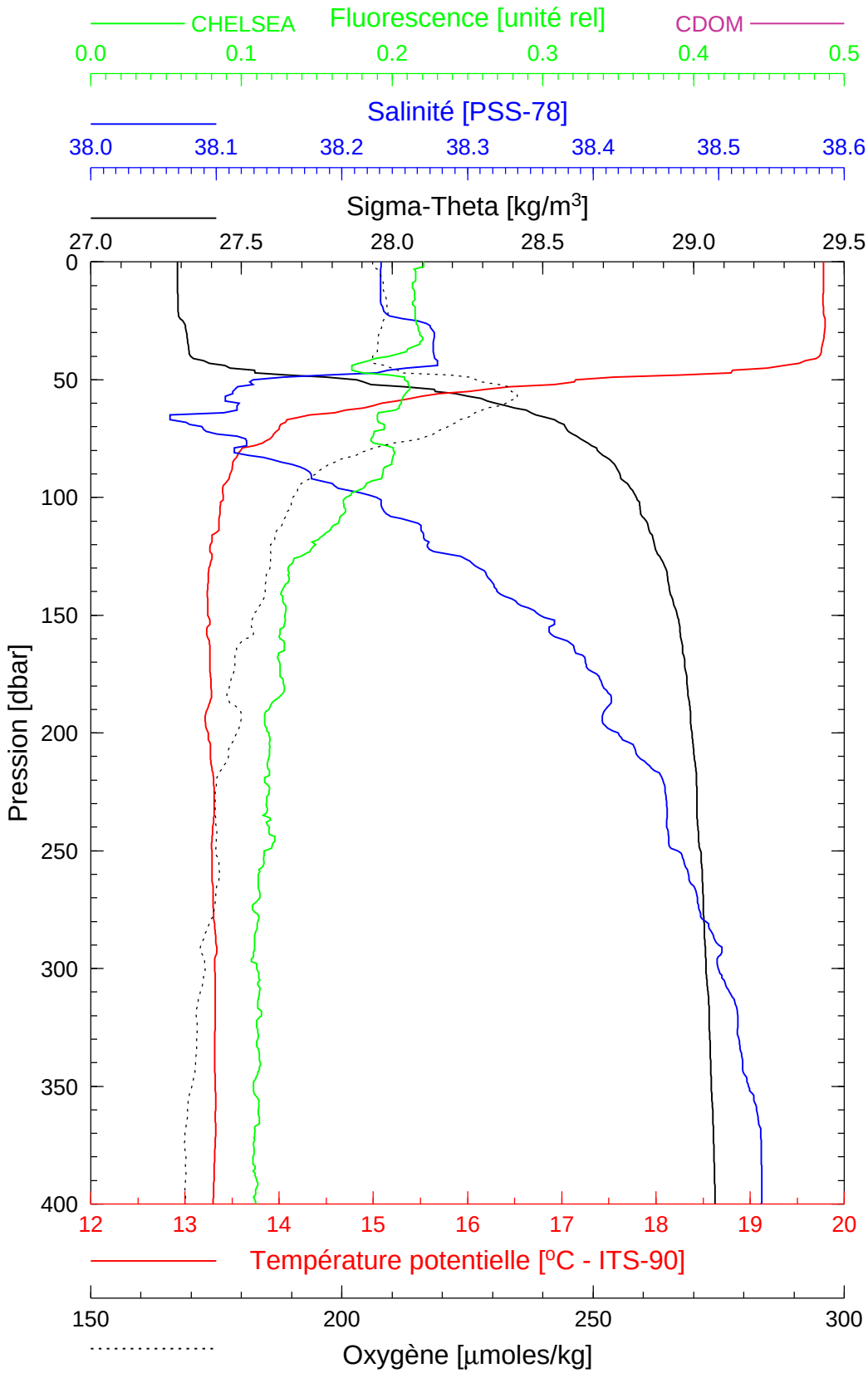
BOUS005



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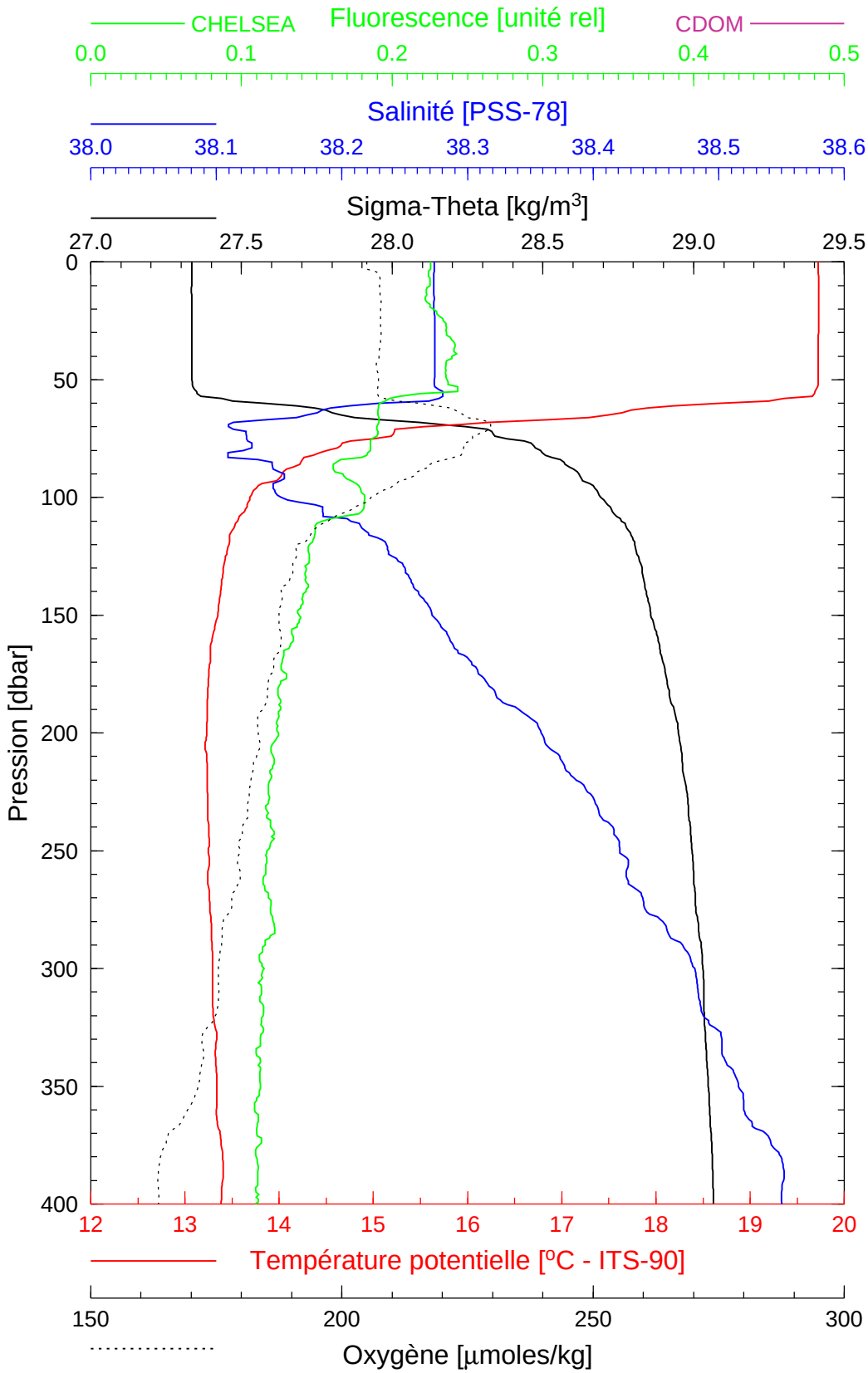
BOUS006



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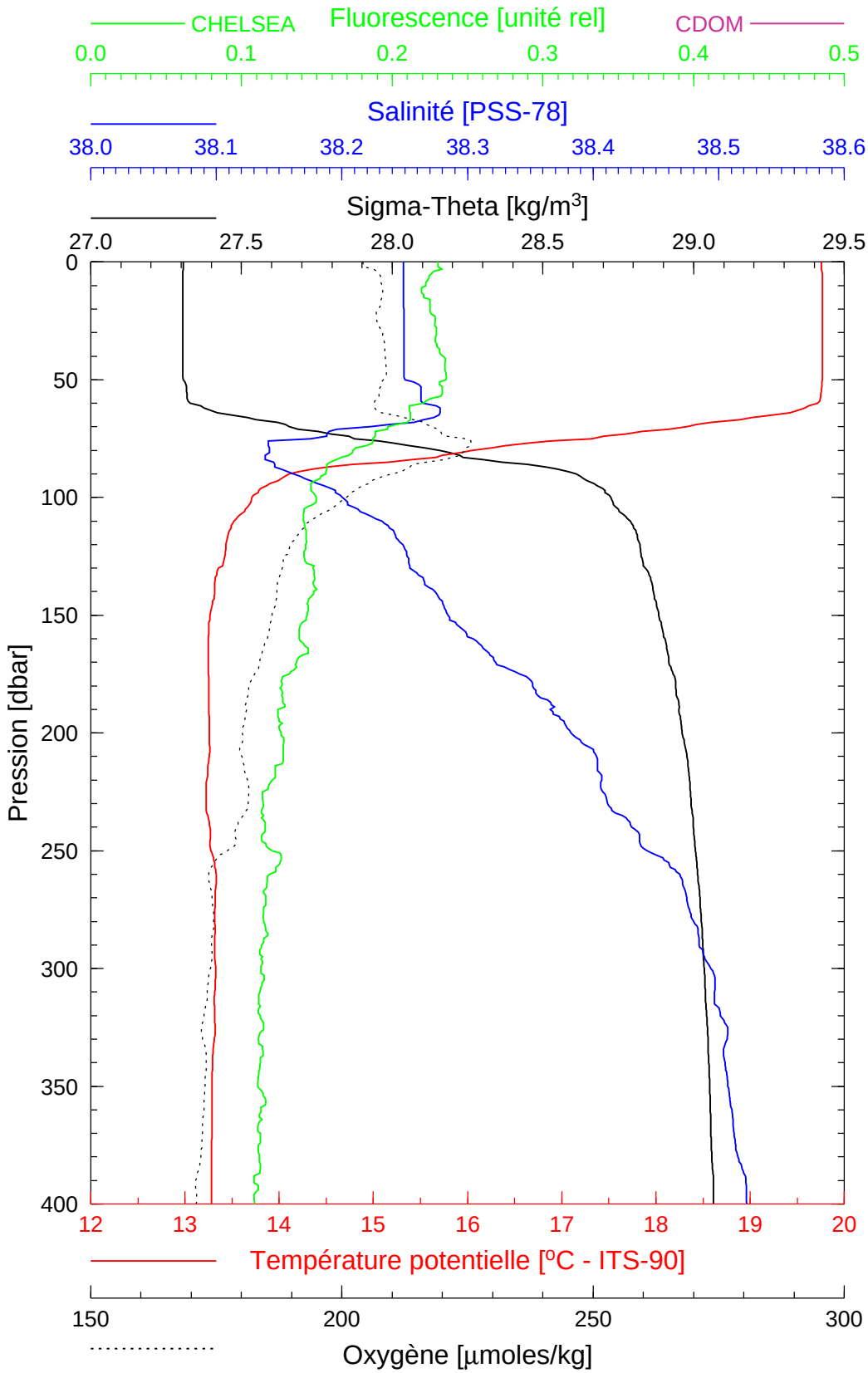
BOUS007



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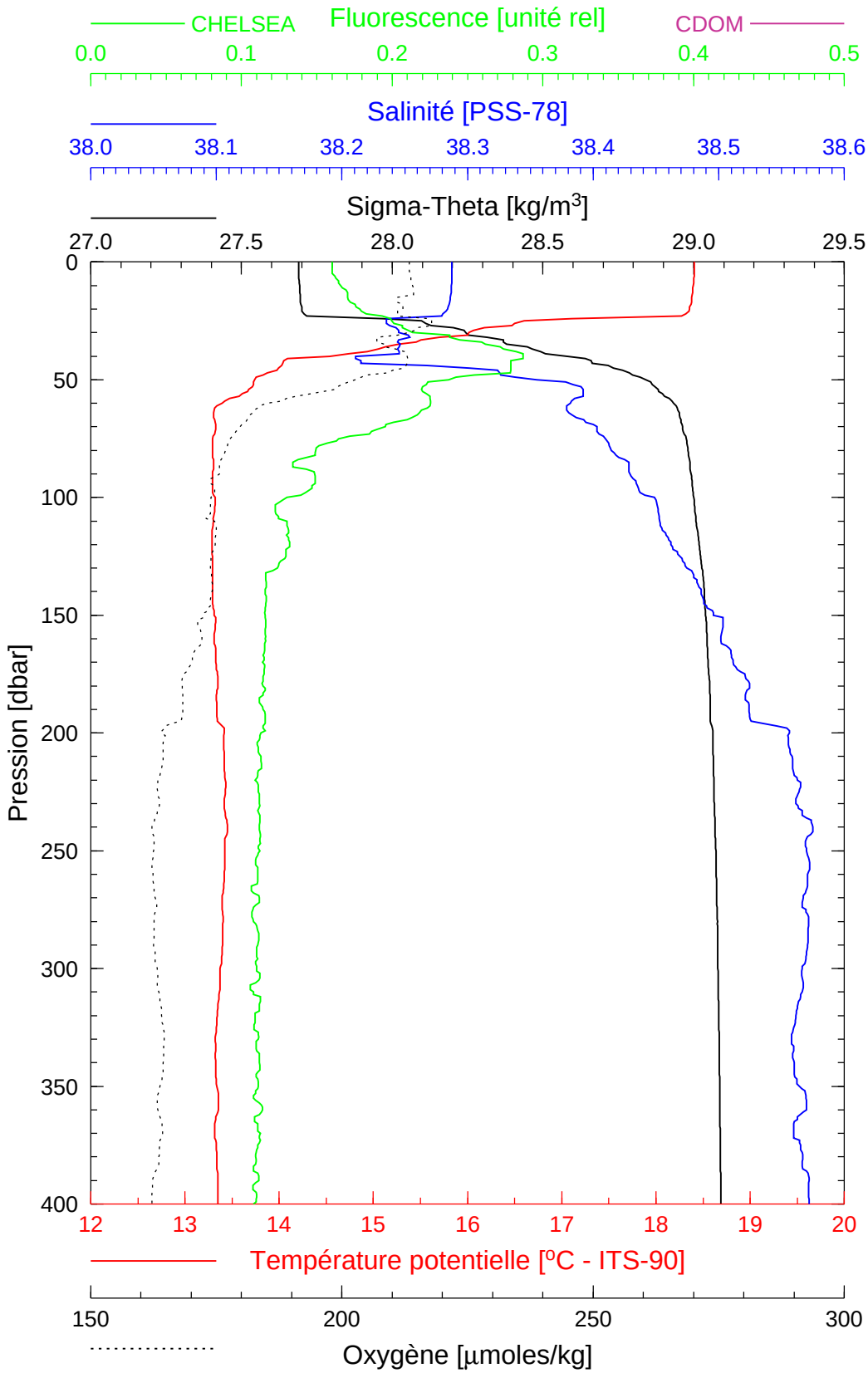
Boussole 47 **06/11/2005** **BOUS051106_01**

BOUS008

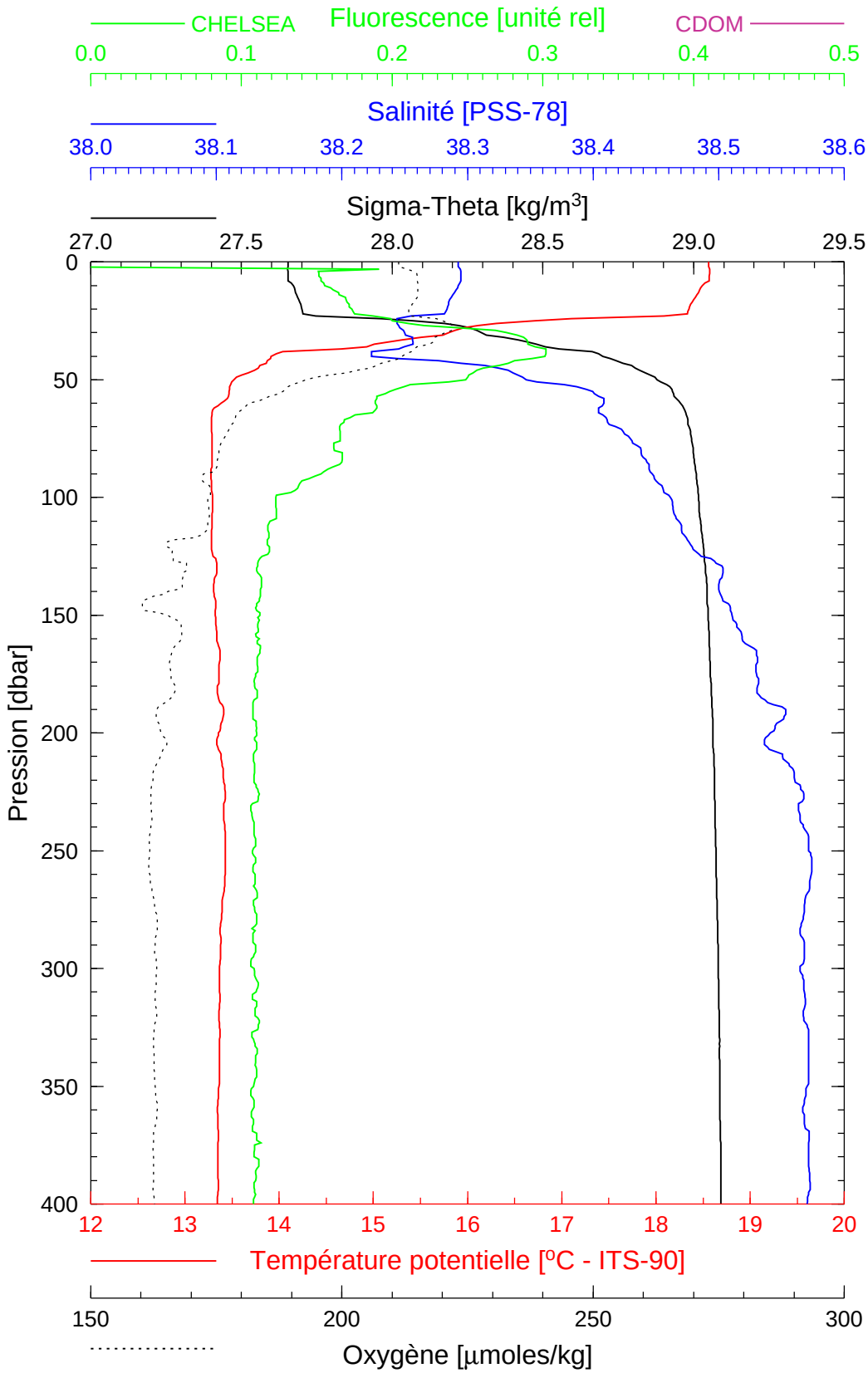


Date *06/11/2005* *Latitude* *43°21.998 N*

Heure déb *09h 06min [TU]* *Longitude* *07°53.969 E*

Boussole 47 **06/11/2005** **BOUS051106_02**

BOUS009



Date *06/11/2005* *Latitude* *43°22.168 N*

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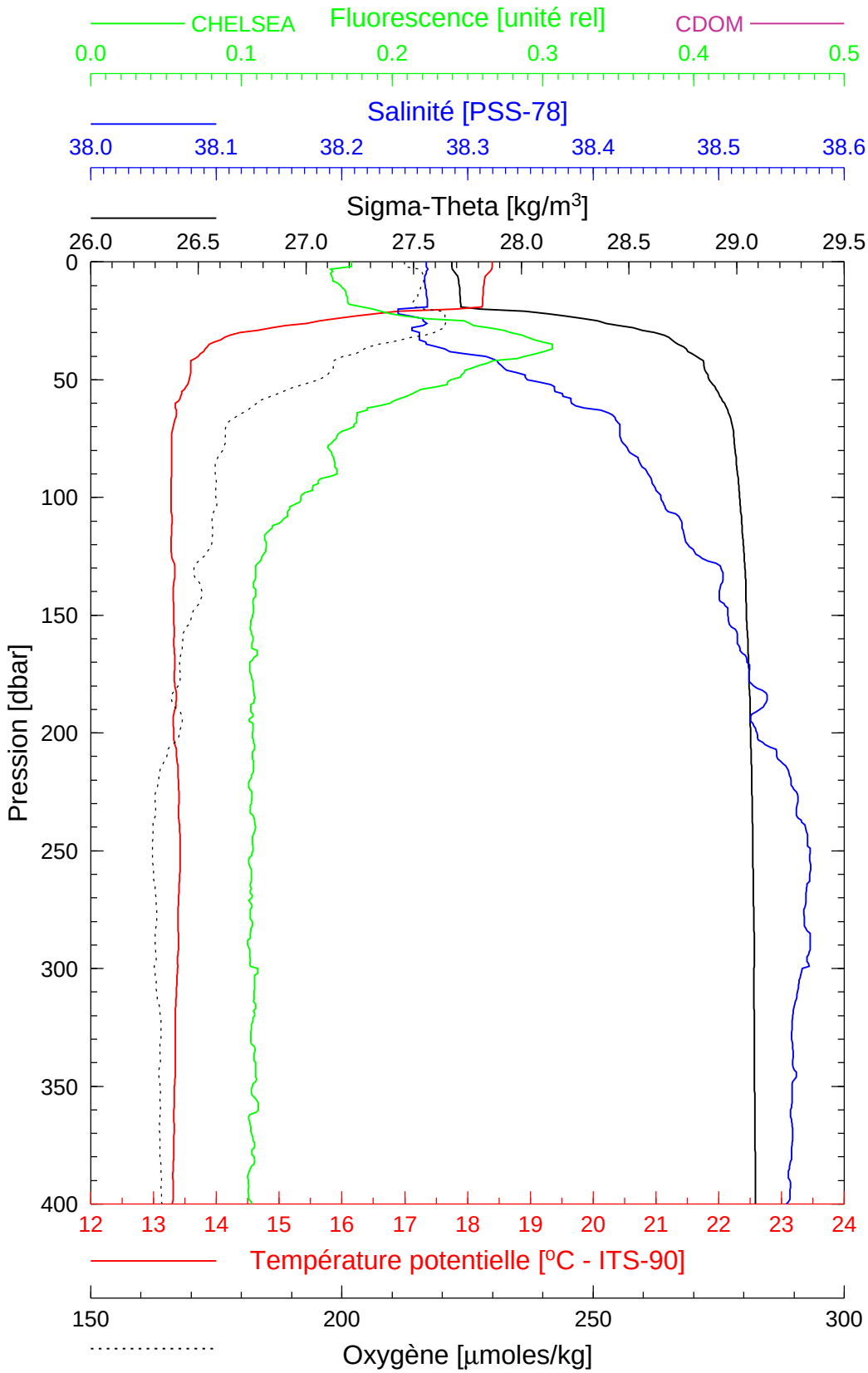
BOUS010



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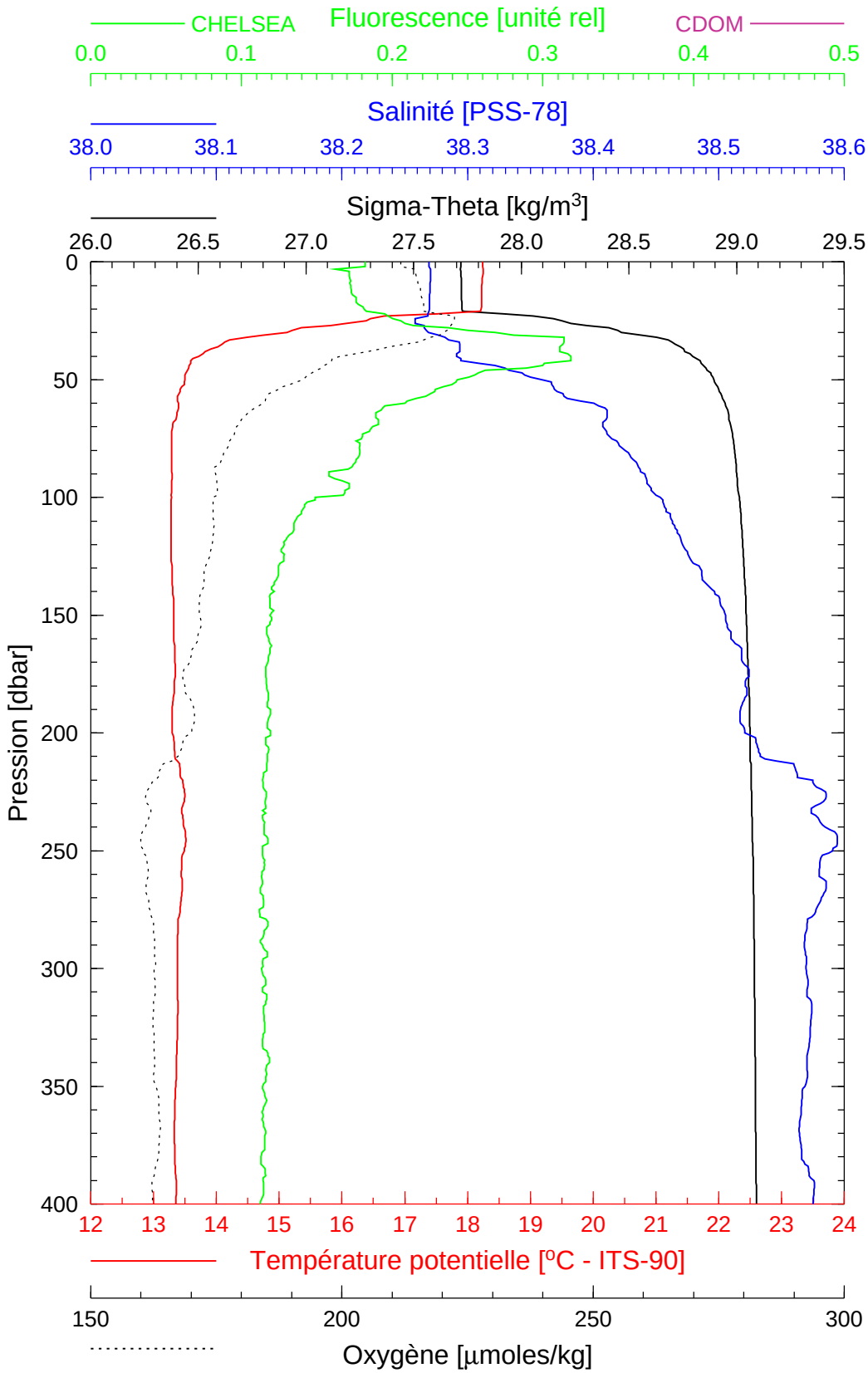
Heure déb *14h 02min [TU]* *Longitude* *07º53.920 E*

Boussole 47 **08/11/2005** **BOUS051108_01**

BOUS011



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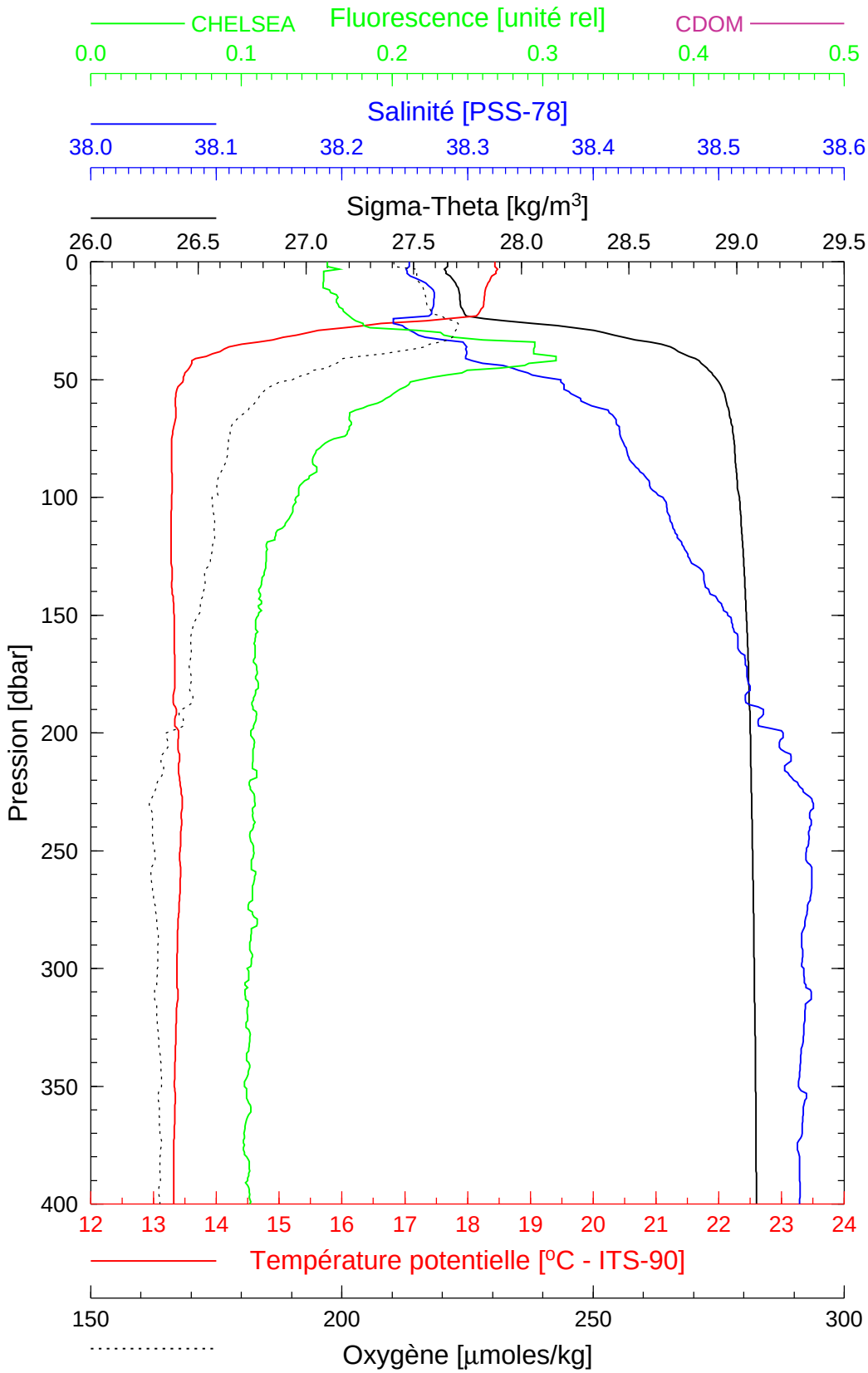
BOUS012



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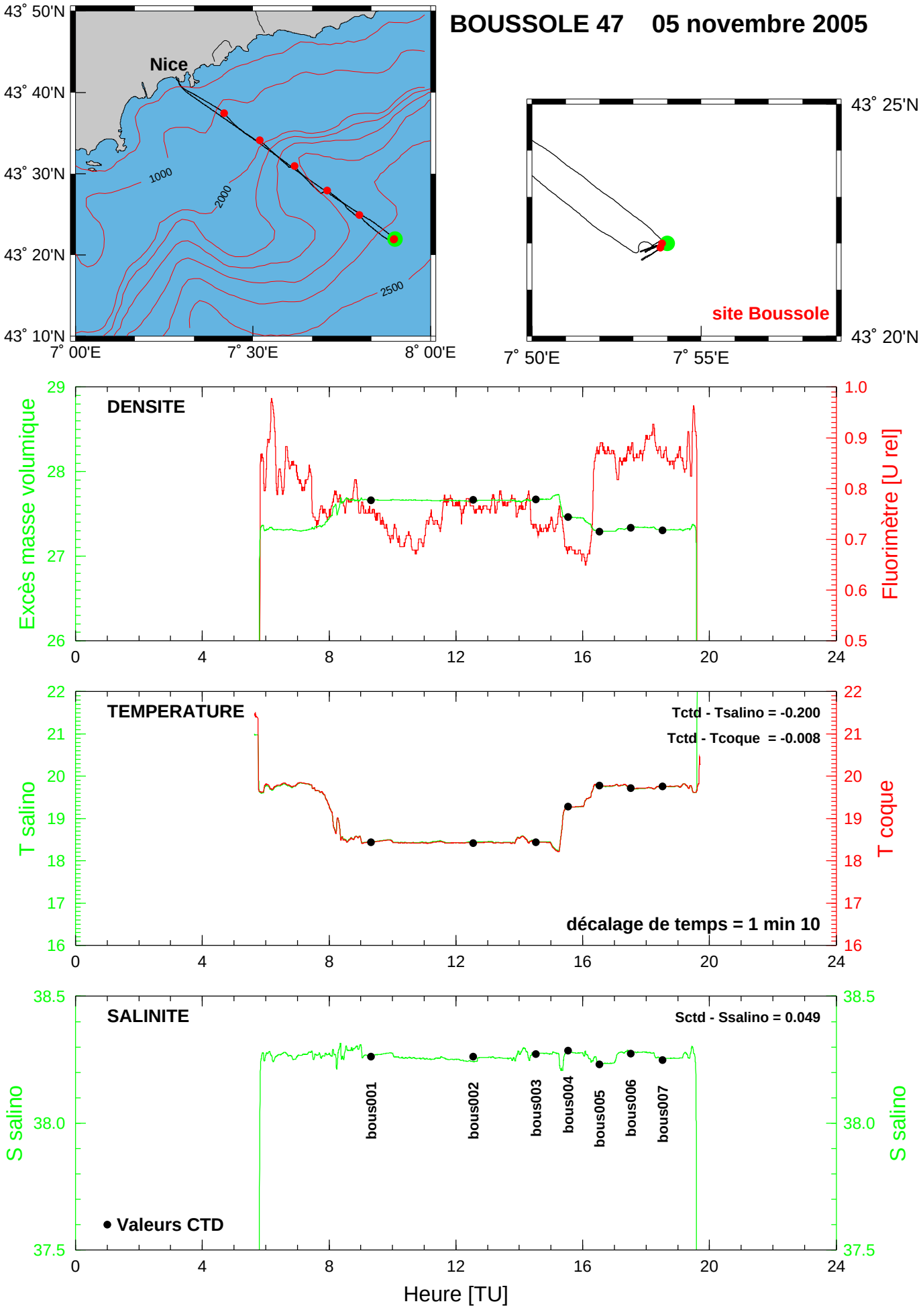
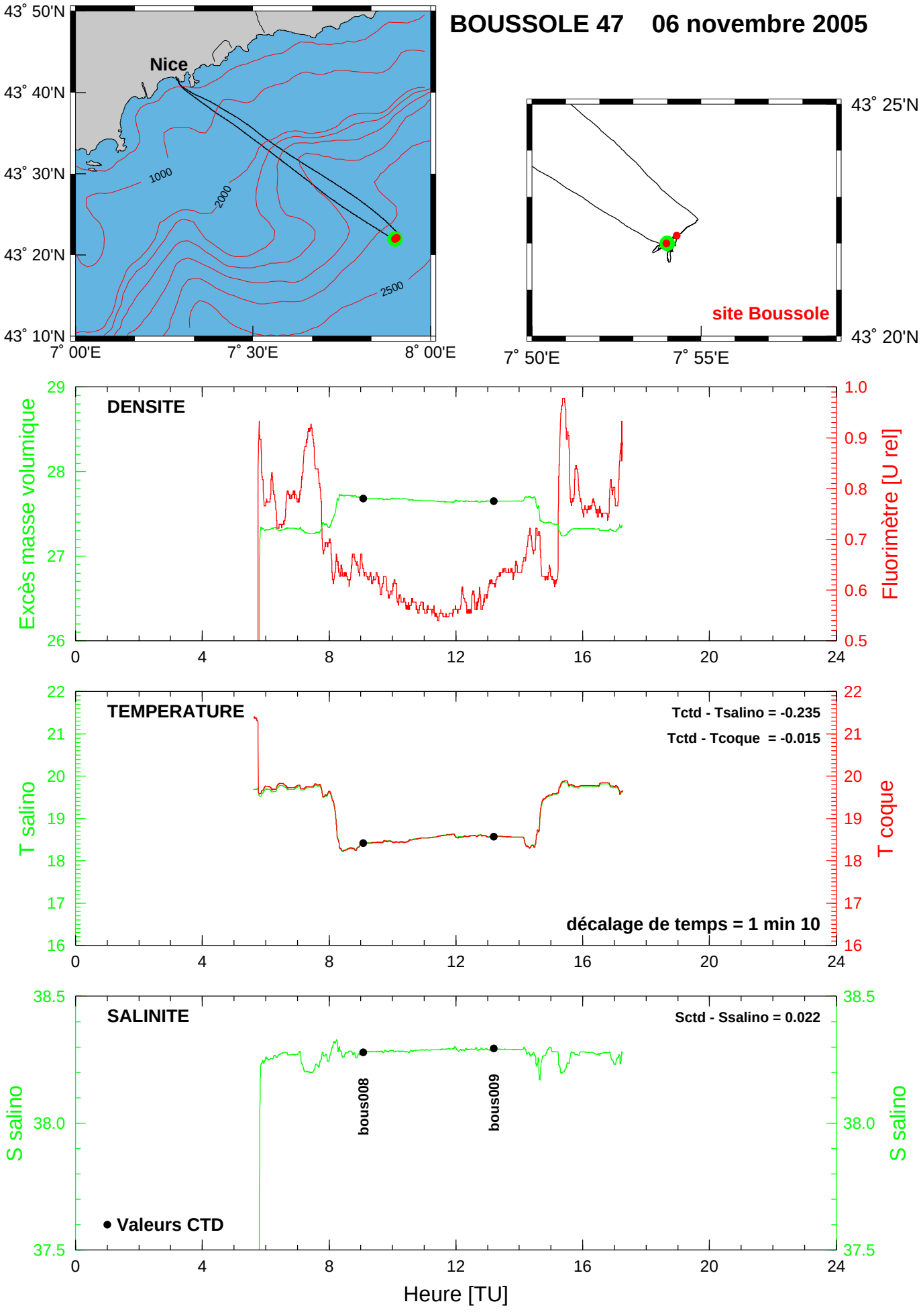
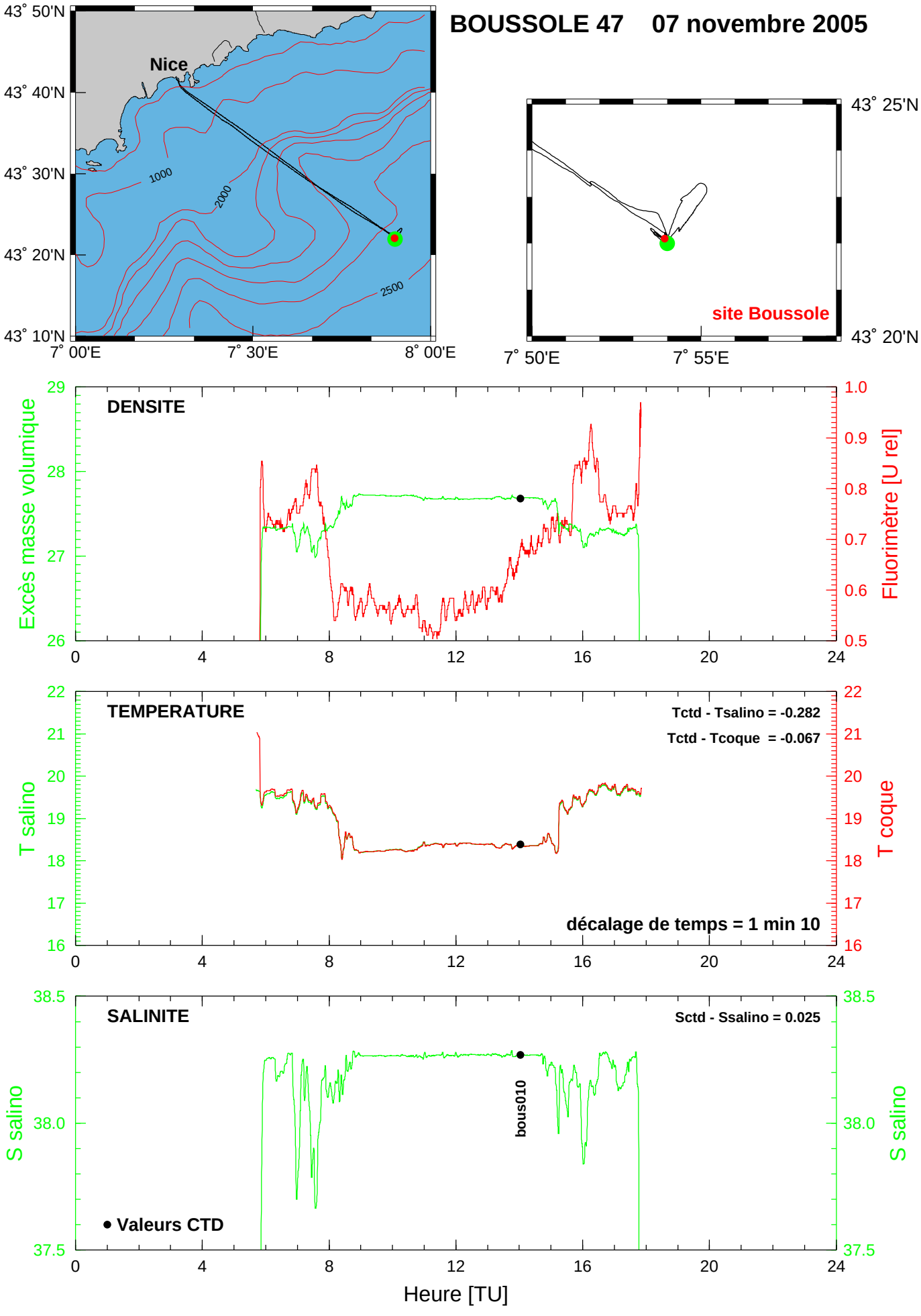
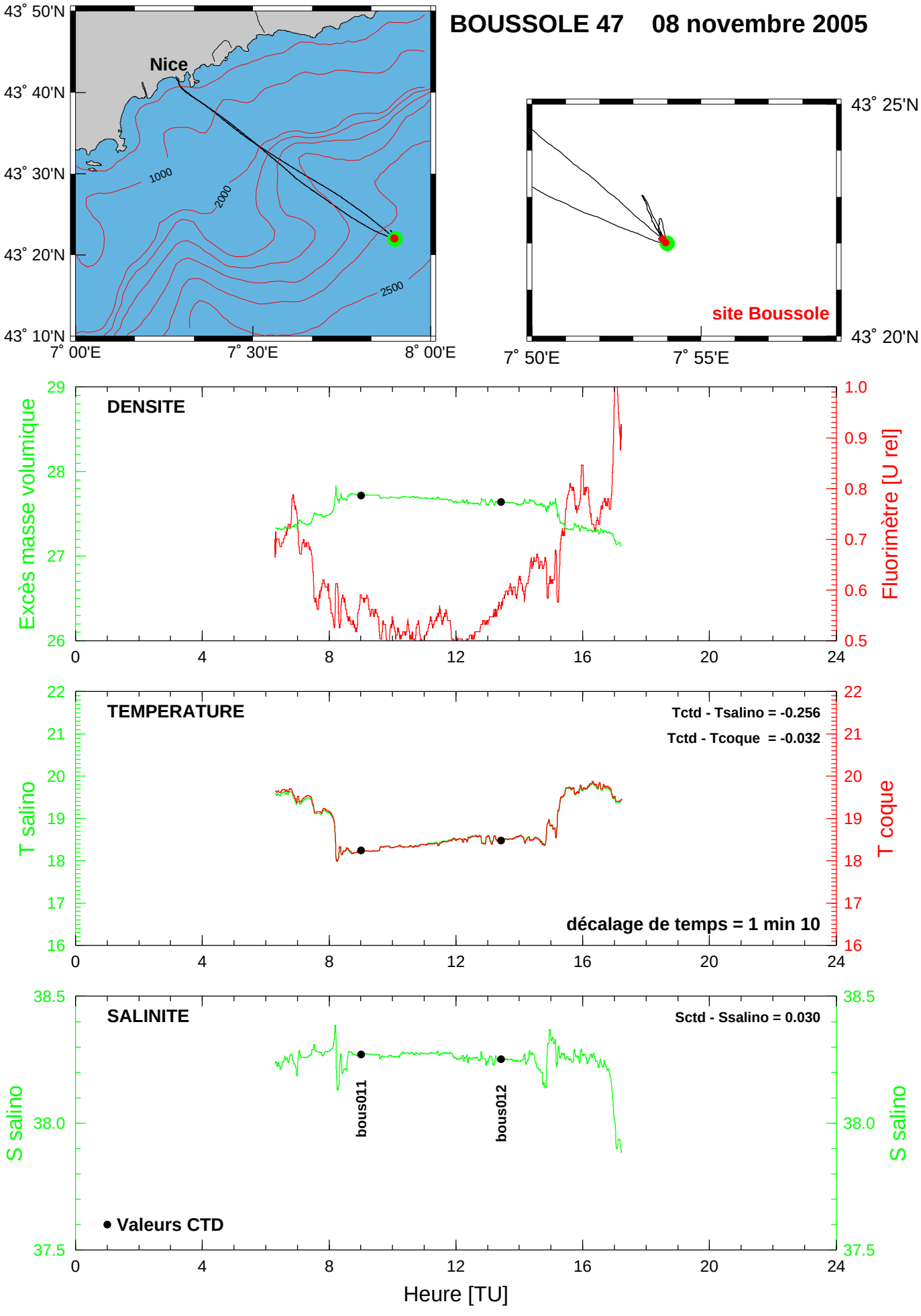

BOUSSOLE 47 05 novembre 2005
Nice
43° 50'N
43° 40'N
43° 30'N
43° 20'N
43° 10'N
7° 00'E
7° 30'E
8° 00'E
1000
2000
2500
43° 25'N
43° 20'N
7° 50'E
7° 55'E
site Boussole
DENSITE
Excès masse volumique
Fluorimètre [U rel]
TEMPERATURE
Tctd - Tsalino = -0.200
Tctd - Tcoque = -0.008
T salino
T coque
décalage de temps = 1 min 10
SALINITE
Sctd - Ssalino = 0.049
S salino
bous001
bous002
bous003
bous004
bous005
bous006
bous007
• Valeurs CTD
Heure [TU]


BOUSSOLE 47 06 novembre 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 = -0.235
Tctd - Tcoque = -0.015
T salino
T coque
décalage de temps = 1 min 10
SALINITE
Sctd - Ssalino = 0.022
bous008
bous009
S salino
• Valeurs CTD
Heure [TU]


BOUSSOLE 47 07 novembre 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 = -0.282
Tctd - Tcoque = -0.067
T salino
T coque
décalage de temps = 1 min 10
SALINITE
Sctd - Ssalino = 0.025
S salino
bous010
• Valeurs CTD
Heure [TU]


BOUSSOLE 47 08 novembre 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 = -0.256
Tctd - Tcoque = -0.032
T salino
T coque
décalage de temps = 1 min 10
SALINITE
Sctd - Ssalino = 0.030
bous011
bous012
S salino
• Valeurs CTD
Heure [TU]