BOUSSOLE Monthly Cruise Report

Cruise 69
November 07 - 10, 2007

Duty Chiefs: Vincenzo Vellucci (enzo@obs-vlfr.fr) & Guislain Bécu (guislain.becu@obs-vlfr.fr)
Vessel: R/V Téthys II
(Captain: Rémy Lafond)

Science Personnel: Guislain Bécu, Dominique Tailliez, Vincenzo Vellucci, Marc Picheral, David Luquet, Yves Lamblard, Christophe Lamoureux.

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

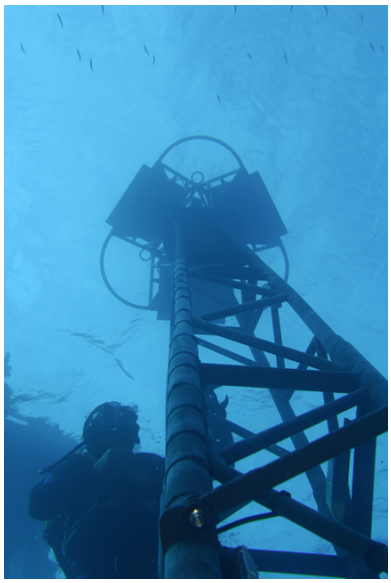


Fig 1. Buoy completely underwater inspected from a diver.

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

November 15, 2007

Contents

1. Cruise Objectives
2. Cruise Summary
3. Cruise Report
4. Calculated Swath paths for Meris Sensor

Appendix

Cruise Objectives

Routine operations

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 six fixed locations on-route from Boussole. The time of day of this transect should be similar for each cruise, if possible to minimise influence of diurnal variability.

For one day of each cruise, three divers will check the underwater state of the buoy structure and instrumentation, take some pictures for archiving, clean the sensor optical surface, and then take again some pictures after cleaning.

For one day of each cruise, 250 ml of sea water will be sampled at 200, 150, 80, 70, 6, 50, 40, 30, 20, 10 and 5 meters depth. For each sample, 125 ml will be filtered through a 0.2 µm GF/F filter and both total and filtered water samples will be analysed with the UltraPath for CDOM absorption determination.

Additional operations

Data received from the two transmissometers were out of scale so a diving operation was organized to exchange the two OCPs. As the buoy stopped to send ARGOS messages on 27th Oct at 5.43 P.M, an exchange of the ARGOS beacon was planned too. Marc Picheral will be on board for one day for 1000 m PVM profiles and 100 m plankton net profiles.

Cruise Summary

The weather conditions were good for the first day of cruise, and for this day, diving operations were planned to troubleshoot the problems with the buoy, by exchanging the two OPCPs with that mounted on the old buoy. Strong currents did not allow divers to complete any operations (included sensor cleaning), but a connection with the buoy was possible before it went underwater and a second before leaving the site. As we were not receiving messages through the ARGOS system, the ARGOS beacon was exchanged with a new one, and after that we started to receive data again. CTD and SPMR were also performed and the transect was completed too. The second day the weather was good and was used to perform CTD and SPMR profiles. The remote connection with the buoy was not successful prior and after cleaning the connectors and a direct connection from the top of the buoy has to be made. The third day weather conditions were not good to perform optical measurements but the boat went anyway at sea and Marc Picheral could collect plankton net and PVM profiles close to the ex-DYFAMED site. The last cruise day was again spent for CTD and SPMR casts. The buoy was completely underwater so it was not possible to attempt any connection.

Tuesday 06 November 2007

At the arrival on site, only the head of the buoy was above water, and it was completely underwater within few minutes. The weather conditions were good and the scheduled diving operations were attempted, but strong currents prevented any operation (the ADCP on board registered ~0.9 m/s at 10m). Some connections were successfully attempted when buoy was above water. The ARGOS beacon was exchanged and its contacts were cleaned from the Zodiac as it was not possible to climb on the buoy. 1 CTD cast, 3 SPMR profiles and a Secchi disk were realized before leaving the site and performing CTD casts along the transect to Nice harbour.

Wednesday 07 November 2007

Weather for this day was good and the time at sea was spent to perform 2 CTD casts (for HPLC, Ap and TSM) and 3 SPMR profiles. Remote connection to the buoy was attempted unsuccessfully, so a direct connection from the top of the buoy was made and data retrieval was successful. Electronic contacts of the CISCO and of the ARGOS beacon were cleaned and a second remote connection attempted but again unsuccessfully.

Thursday 08 November 2007

This day there were non activities as the exchange of crew on board the *Thetys II* was planned.

Friday 09 October 2007

Forecast predicted bad weather conditions to perform optical measurements and this day was used to realize 2 PVM and 3 plankton net profiles.

Saturday 10 October 2007

Weather conditions were not optimal, but allowed to perform 1 CTD cast (for HPLC, Ap and TSM), 1 Secchi disk and 3 SPMR profiles. The buoy was again completely underwater, and no connection was possible (the ADCP on board registered ~0.2 m/s currents in the first 100 m, probably there were stronger deep currents).

Cruise Report

06 November 2007 (UTC)

0550 Departure from the port of Nice.
0900 Arrival at the BOUSSOLE site, only the head of the buoy is above water.
0915 Connection to the buoy: successful. Retrieved data and updated DACNet configuration for the exchange of the OCPs.
0925 The buoy goes underwater.
0945 After looking for the buoy underwater, divers go at sea for cleaning operations and to exchange the OCPs and the ARGOS beacon. Divers attempted to complete the operations but strong currents did not allowed them to work and all operations were stopped.
1050 CTD 01, 400m, close to the buoy, with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters for HPLC and Ap.
1228 SPMR profiles 01, 02, and 03.
1315 Top of the buoy again above water (~2m). Attempted a second connection with the buoy while deploying SPMR: unsuccessful as it was too far.
1330 The ARGOS beacon was exchanged and the connections were cleaned from the Zodiac.
1355 Secchi disk 02 close to the buoy, 21 m.
1415 Connection to the buoy: successful. Retrieved data and restored the previous configuration of the DACNet since the OCPs were not exchanged.
1406 CTD 02, 400 m, station 01 (43°25'N 07°48'E).
1505 CTD 03, 400 m, station 02 (43°28'N 07°42'E).
1606 CTD 04, 400 m, station 03 (43°31'N 07°37'E).
1709 CTD 05, 400 m, station 04 (43°34'N 07°31'E).
1813 CTD 06, 400 m, station 05 (43°37'N 07°25'E).
1909 CTD 07, 400 m, station 06 (43°39'N 07°21'E).
2030 Arrival at the port of Nice.

07 November 2007

0700 Departure from the port of Nice.

1010 Arrival at the BOUSSOLE site.
1020 CTD 08, 5 m, close to the buoy, with water sampling at 5 meters for TSM.
1030 CTD 09, 400 m, close to the buoy, with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters for HPLC, Ap and CDOM.
1115 Connection attempt to the buoy: unsuccessful!
1215 Direct connection from the top of the buoy: successful. Retrieved data and cleaned the contacts of the ARGOS beacon and CISCO. Output voltage recorded from the DACNet in the nominal range. No more operations feasible as the buoy starts lowering underwater again.
1225 SPMR profiles 04, 05, and 06.
1300 Departure from the BOUSSOLE site, the buoy is still underwater.
1630 Arrival at the port of Nice.

08 November 2007

Exchange of crew on board the *Thethys II*.

09 November 2007

xxyy Departure from the port of Nice.
xxyy Plankton net 0-100m 01, 02, and 03.
xxyy PVM 1000 m profiles 01 and 02
xxyy Arrival to the port of Nice.

10 November 2007

0530 Departure from the port of Nice.
0830 Arrival at the BOUSSOLE site. The buoy is completely underwater.
0900 CTD 10, 400 m, close to the buoy, with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters for HPLC and Ap. TSM was sampled at 5 m too.
0905 CIMEL 01 close to the buoy.
1013 SPMR profiles 07, 08, and 09.
1050 Secchi disk 02 close to the buoy, 21 m.
1125 Departure from the BOUSSOLE site, the buoy is still underwater.
1450 Arrival to the port of Nice.

Calculated Swath paths for the MERIS Sensor (ESOV Software)

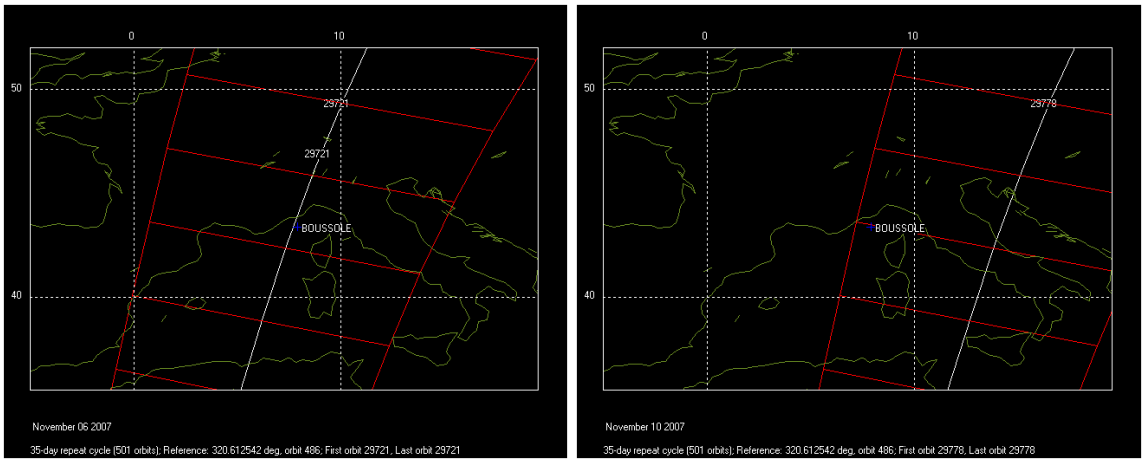


Figure 2. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for Novemberber 06 and 10, 2007.

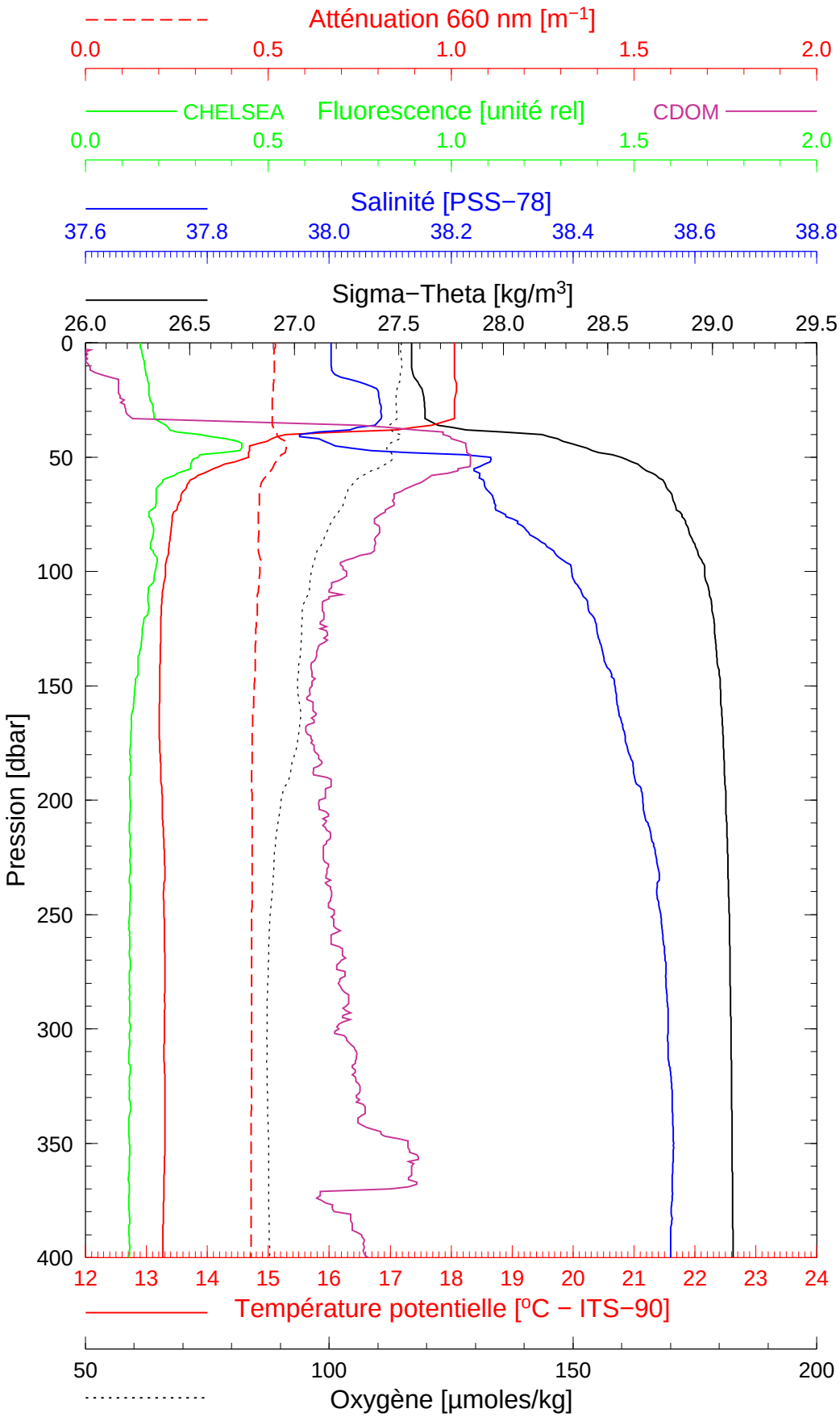
Appendix

Cruise Summary Table for Boussole 69

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.	Whitecaps
			CTDBOUS001	10:50	24:00	400	43	22.075	7	53.415						7			1029.5	76		16.0	18.1	calm			
	Bou061107black1			12:28	03:00																						
		Bou061107AA		12:39	04:00	180	43	22.180	7	53.340				blue	Cu	1	4kn	67	1040.6	71	Good	15.9		calm	0.5 m		no
		Bou061107AB		12:52	04:00	190	43	22.180	7	53.314				blue	Cu	1	4kn	67	1040.6	71	Good	15.9		calm	0.5 m		no
		Bou061107AC		13:04	05:00	198	43	22.212	7	53.226				blue	Cu	1	4kn	67	1040.6	71	Good	15.9		calm	0.5 m		no
11/06/07	Bou061107black2			13:19	03:00																						
			CTDBOUS002	14.06	26:00	400	43	32.236	7	29.011						1	12kn	57	1027.6	71		16.7	17.9	calm			
			CTDBOUS003	15.05	27:00	400	43	27.988	7	42.212						2	12kn	45	1023.3	76		18.3	18.2	calm			
			CTDBOUS004	16.06	26:00	400	43	30.958	7	36.973						9	17kn	50	1024.3	76		16.8	18.2	small waves			
			CTDBOUS005	17.09	26:00	400	43	34.013	7	30.984						9	16kn	30	1023.6	76		16.7	18.2	small waves			
			CTDBOUS006	18.13	27:00	400	43	36.985	7	25.094						9	14kn	180	1023.0	76		16.6	18.2	small waves			
			CTDBOUS007	20.09	25:00	400	43	39.012	7	20.956						9	4kn	203	1027.6	75		17.0	18.3	calm			
				10:20	5:00	5	43	30	7	54	wat. samp. TSM																
			CTDBOUS008	10:30	30:00	400	43	29.797	7	53.643						3	5kn	241	1035.4	48		17.4	17.9	calm			
	Bou071107black1			12:27	03:00																						
11/7/2007		Bou071107AA		12:34	04:30	180	43	21.823	7	54.015				covered	Ci/Strat	5	11kn	228	1033.9	57	very good	16.6		calm	0.7 m		no
		Bou071107AB		12:45	05:13	200	43	21.728	7	54.071				covered	Ci/Strat	5	11kn	228	1033.9	57	very good	16.6		calm	0.7 m		no
		Bou071107AC		12:57	04:52	165	43	21.616	7	54.090				covered	Ci/Strat	5	11kn	228	1033.9	57	very good	16.6		calm	0.7 m		no
	Bou071107black2			13:10	03:00																						
11/08/07	**Crew exchange**																										
11/09/07	**Bad weather conditions**																										
			CTDBOUS009	9:03	27:00	400	43	21.769	7	53.302	wat. samp. TSM					2	10kn	263	1004.2	53		14.0	16.9	small waves			
	Bou101107black1			10:13	03:00																						
11/10/07		Bou101107AA		10:30	04:55	175	43	21.060	7	53.706				blue	Ci/A.plane	2	14kn	86	1011.0	61	very good	14.2		choppy	1.5 m		Few
		Bou101107AB		10:47	06:19	209	43	20.799	7	53.525				blue	Ci/A.plane	2	14kn	86	1011.0	61	very good	14.2		choppy	1.5 m		Few
		Bou101107AC		11:04	05:30	200	43	20.504	7	53.220				blue	Ci/A.plane	2	14kn	86	1011.0	61	very good	14.2		choppy	1.5 m		Few
	Bou101107black2			11:23	03:00																						

Boussole 69 **06/11/2007** **BOUS071106_01**

BOUS001

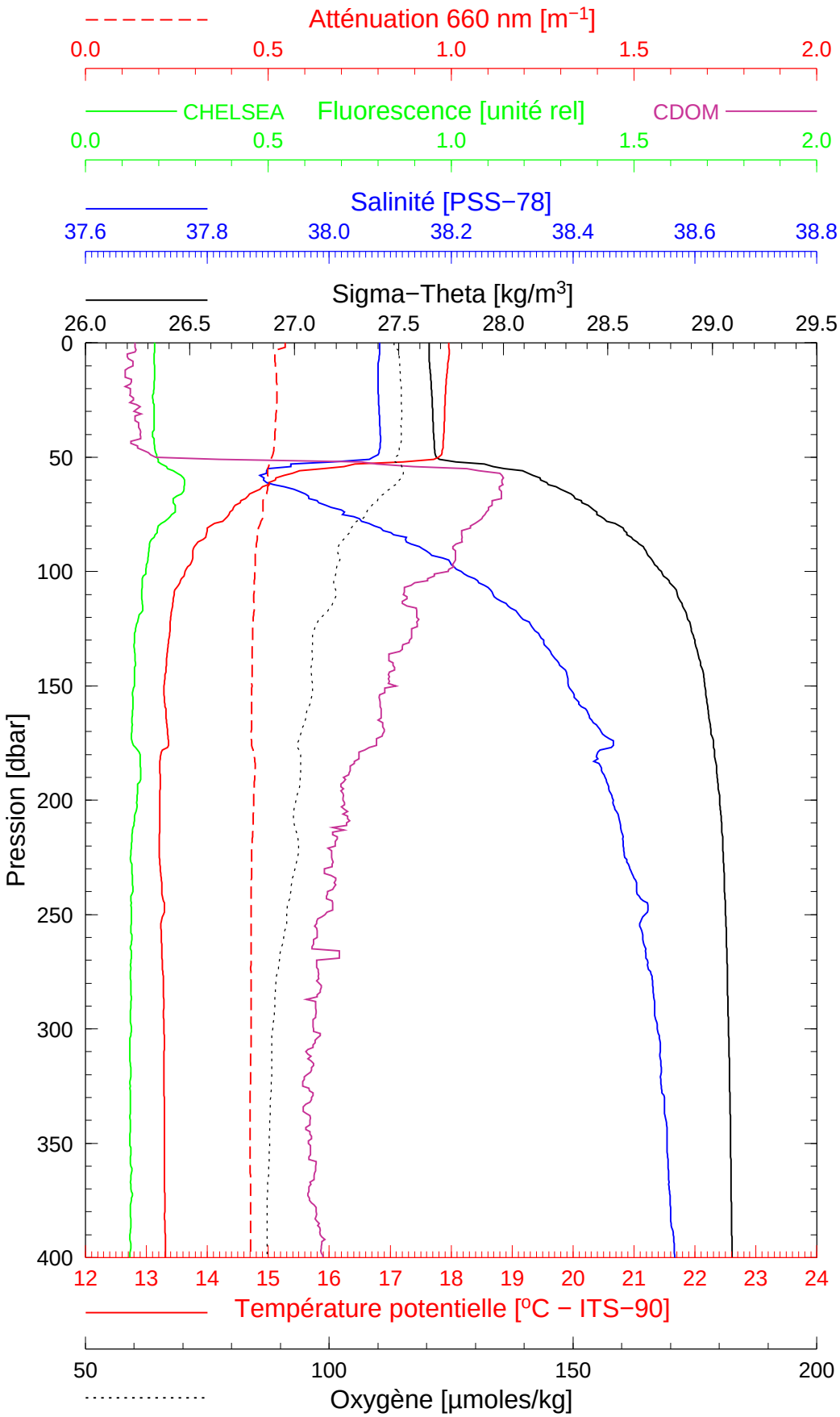


Date *06/11/2007* *Latitude* *43°22.075 N*

Heure déb *10h 52min [TU]* *Longitude* *07°53.415 E*

Boussole 69 **06/11/2007** **BOUS071106_02**

BOUS002

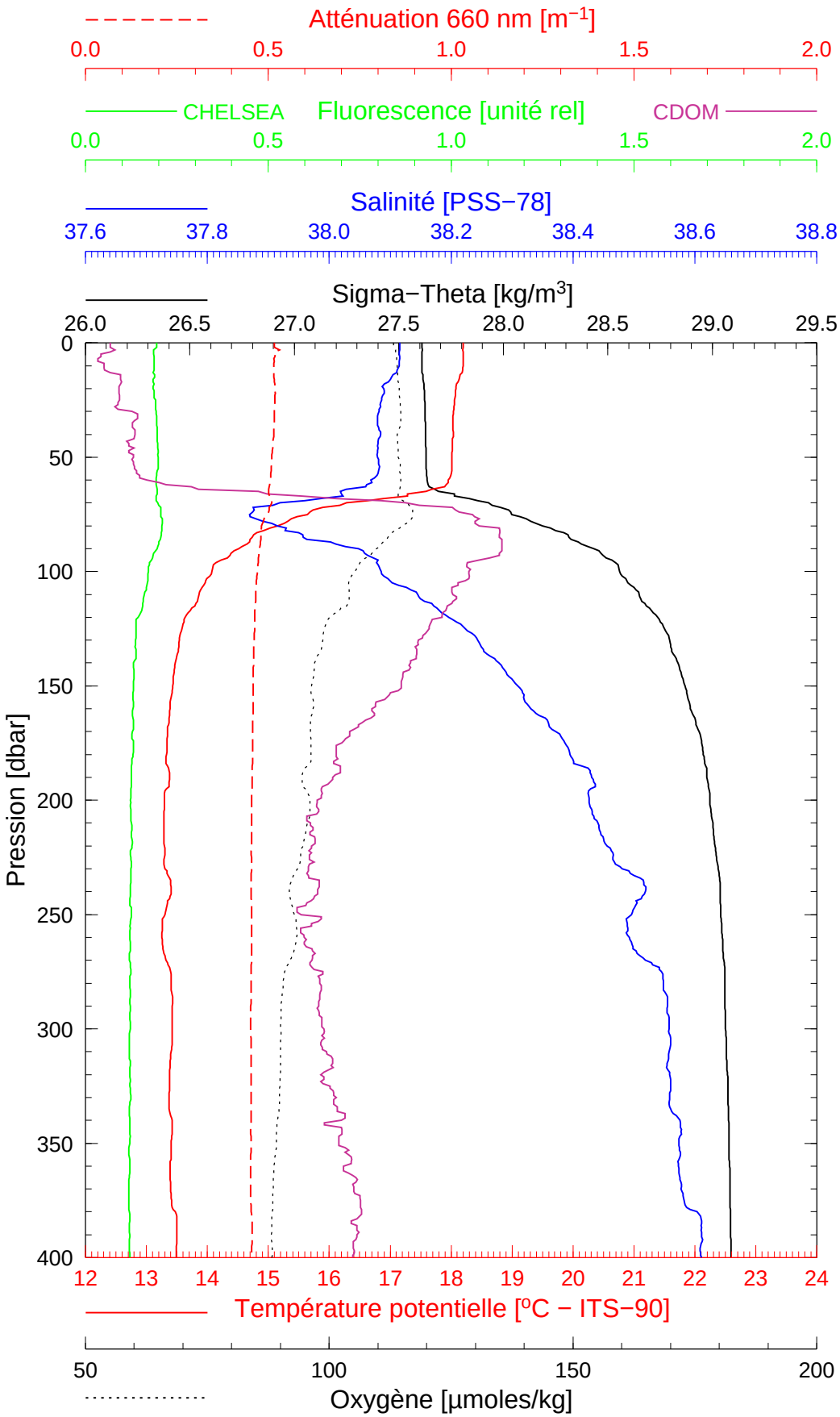


Date *06/11/2007* *Latitude* *43°24.971 N*

Heure déb *15h 06min [TU]* *Longitude* *07°47.727 E*

Boussole 69 **06/11/2007** **BOUS071106_03**

BOUS003

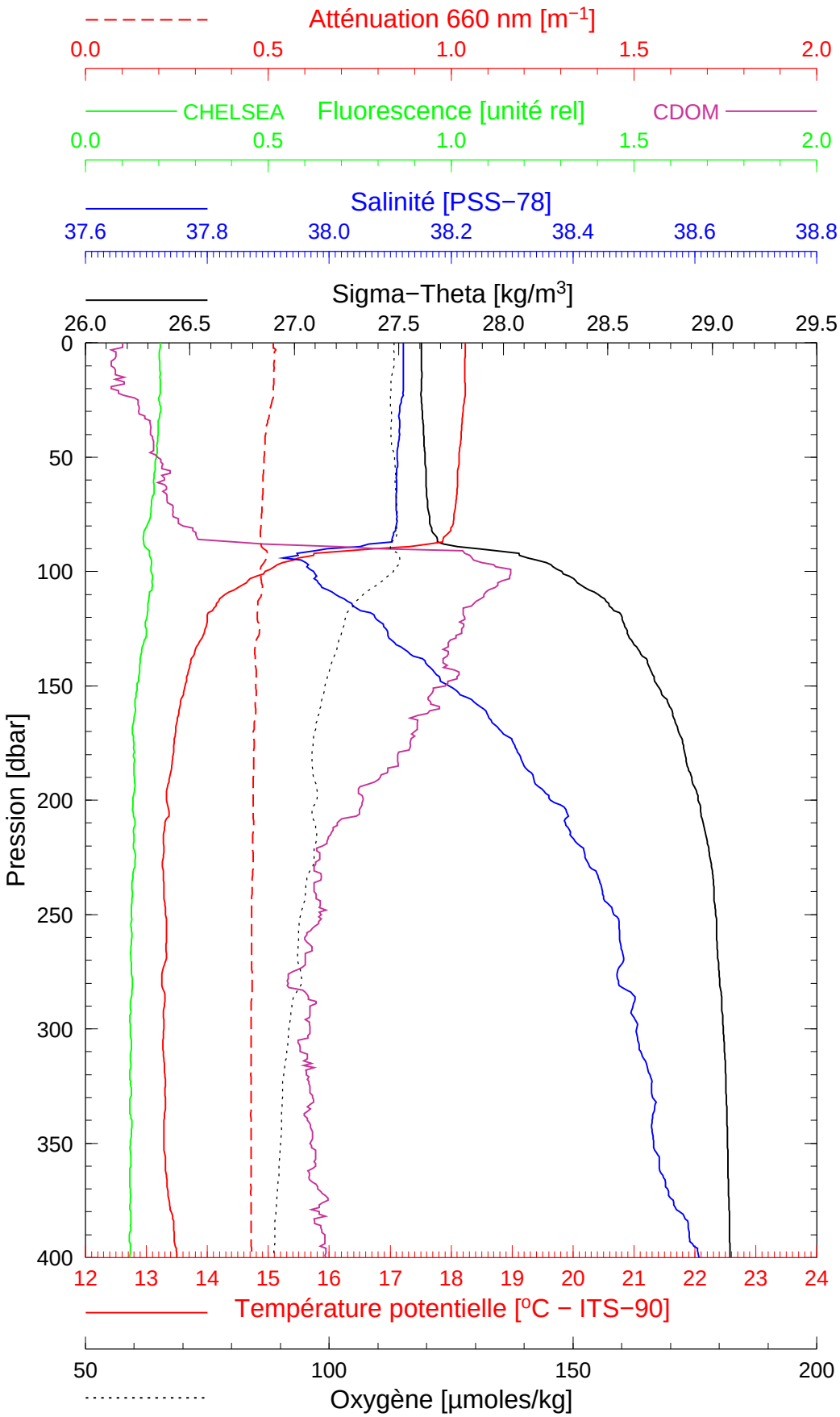


Date *06/11/2007* *Latitude* *43°27.988 N*

Heure déb *16h 05min [TU]* *Longitude* *07°42.212 E*

Boussole 69 **06/11/2007** **BOUS071106_04**

BOUS004

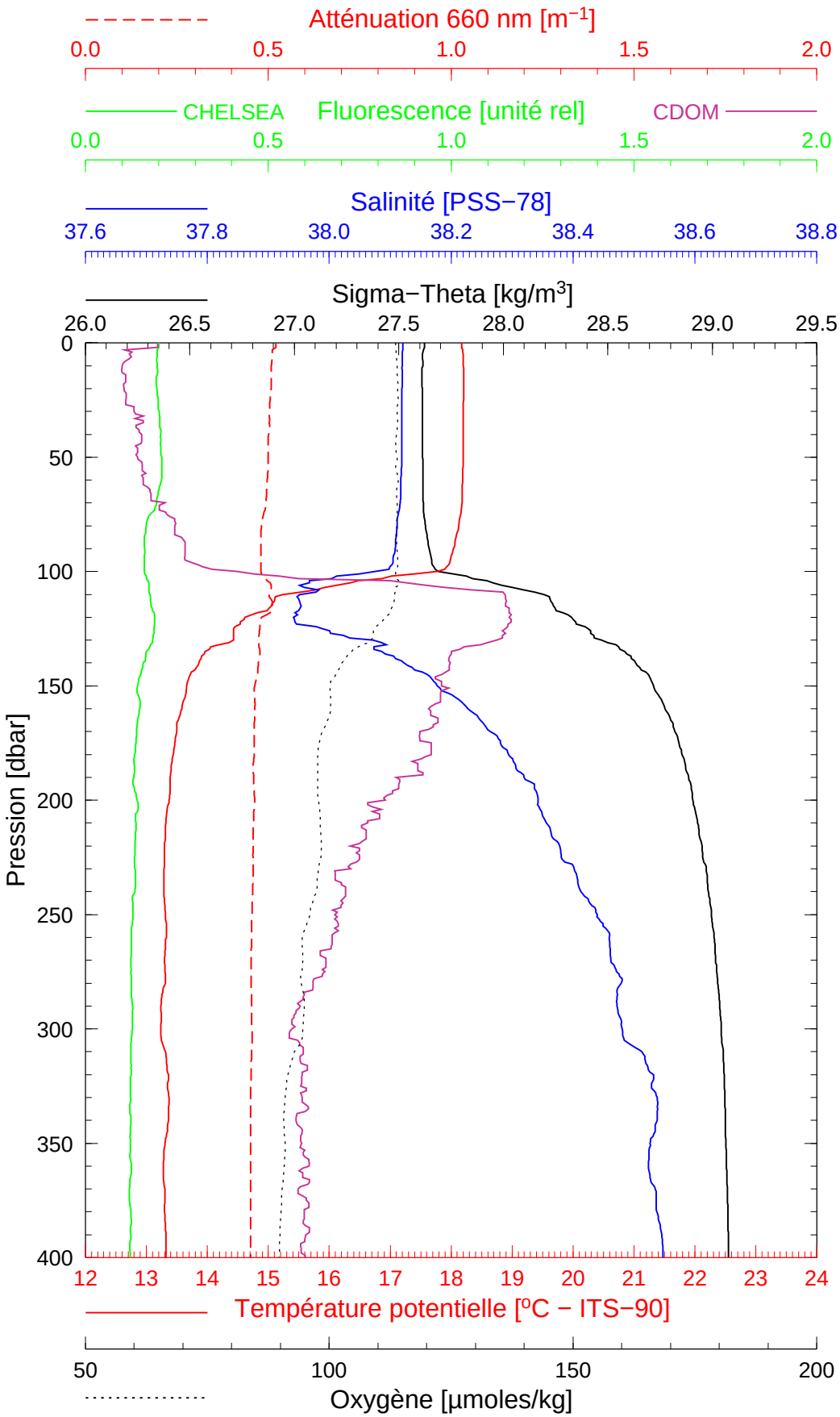


Date *06/11/2007* *Latitude* *43°30.958 N*

Heure déb *17h 06min [TU]* *Longitude* *07°36.973 E*

Boussole 69 **06/11/2007** **BOUS071106_05**

BOUS005

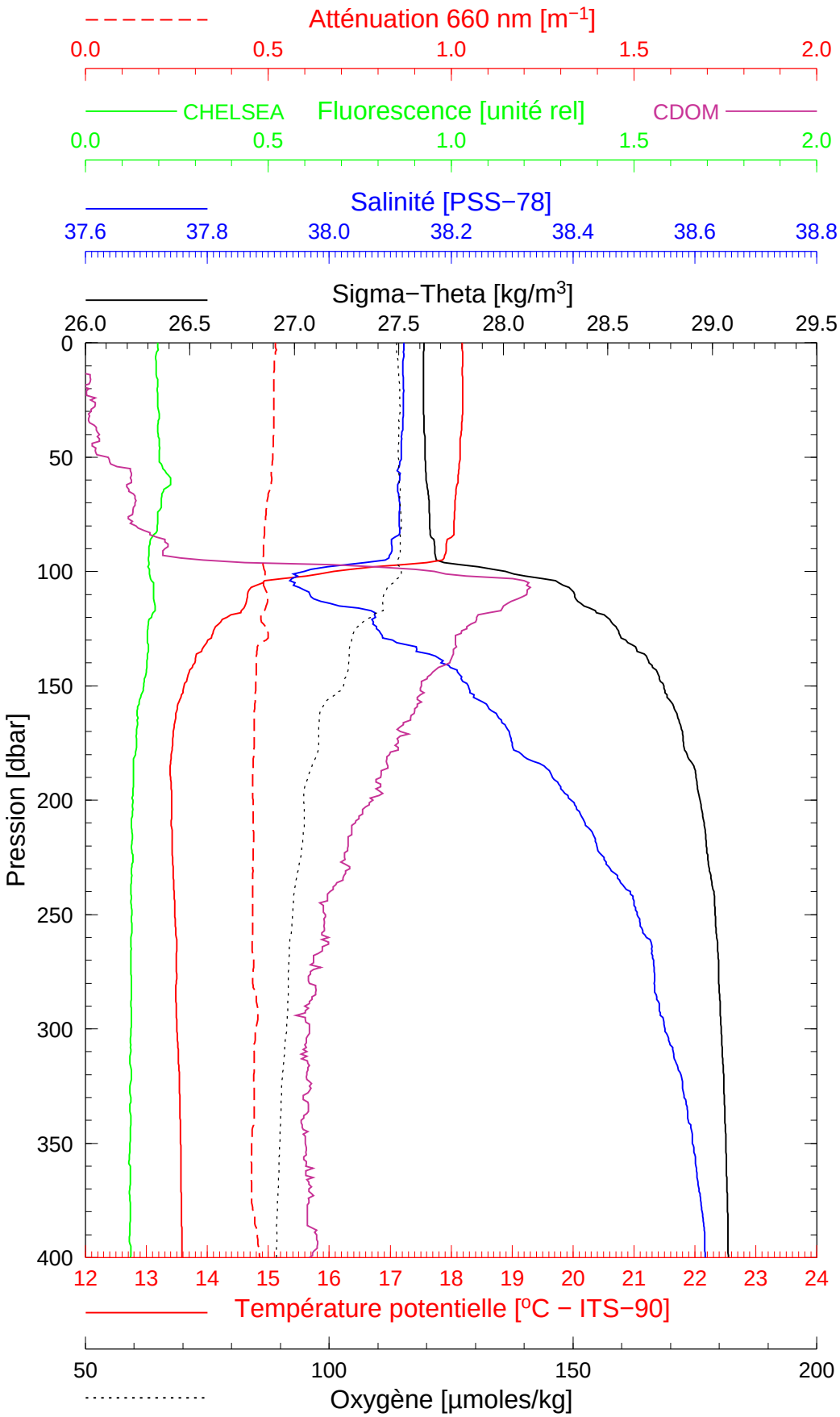


Date *06/11/2007* *Latitude* *43°34.013 N*

Heure déb *18h 09min [TU]* *Longitude* *07°30.984 E*

Boussole 69 **06/11/2007** **BOUS071106_06**

BOUS006

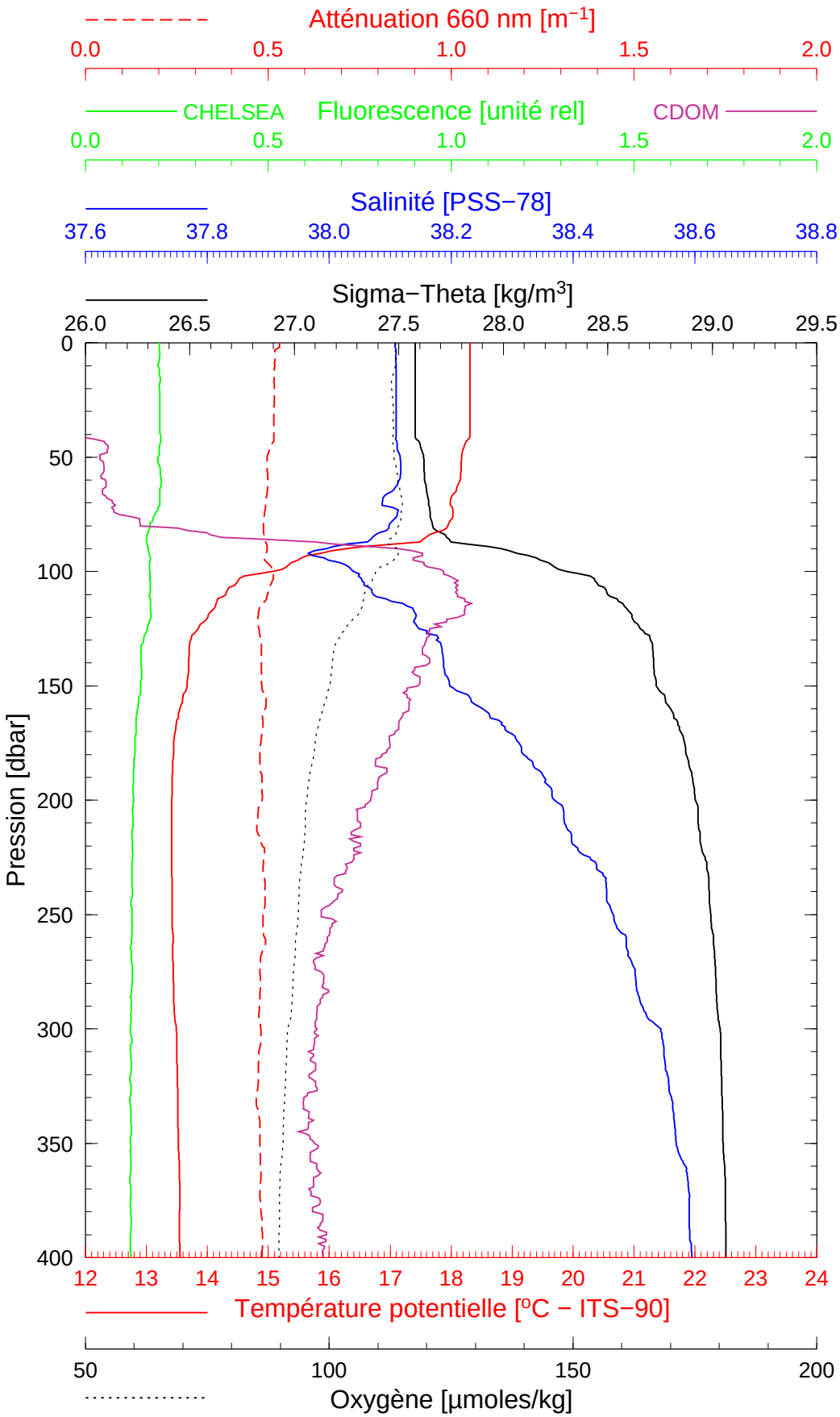


Date *06/11/2007* *Latitude* *43°36.985 N*

Heure déb *19h 13min [TU]* *Longitude* *07°25.094 E*

Boussole 69 **06/11/2007** **BOUS071106_07**

BOUS007

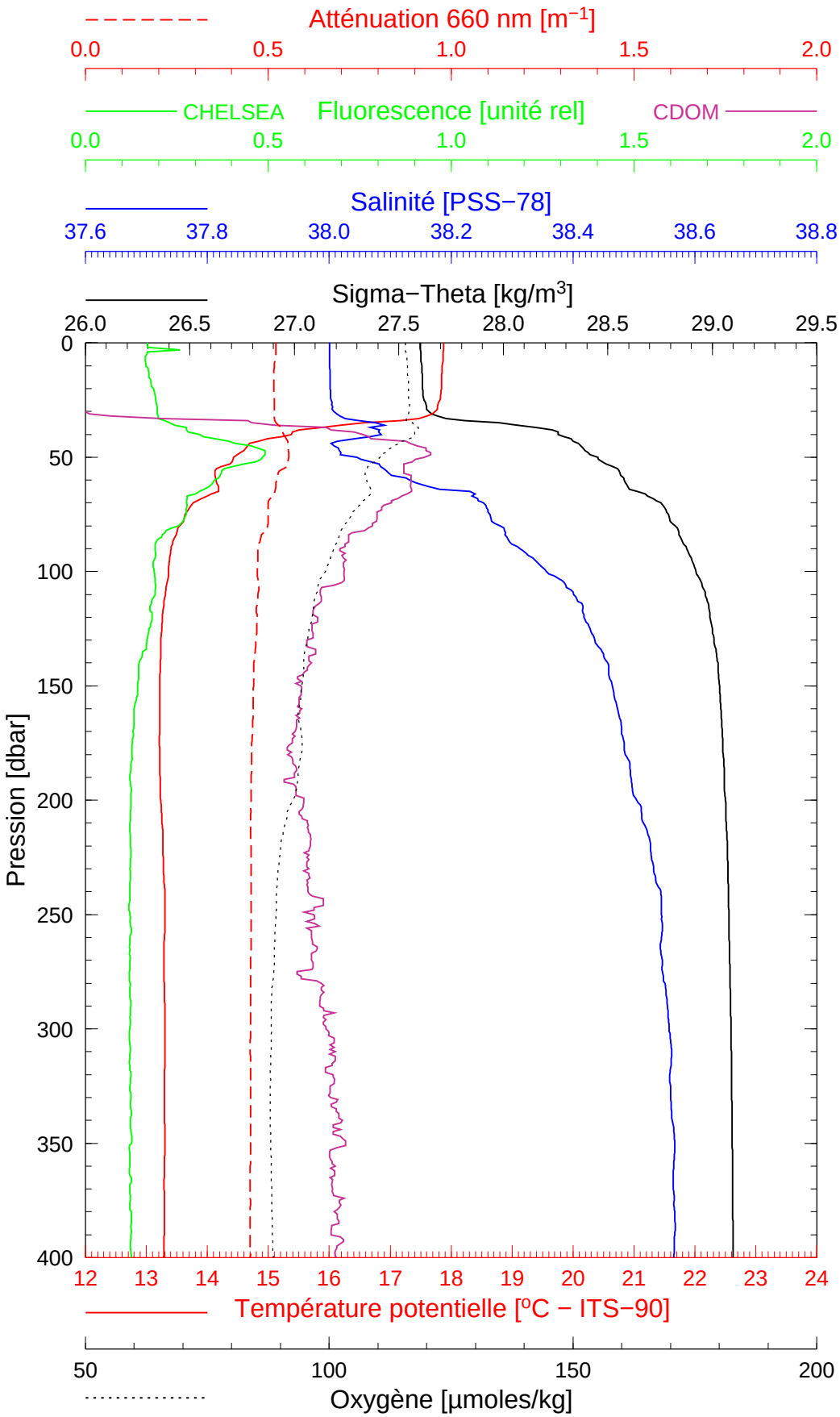


Date *06/11/2007* *Latitude* *43°39.012 N*

Heure déb *20h 09min [TU]* *Longitude* *07°20.956 E*

Boussole 69 **07/11/2007** **BOUS071107_08**

BOUS008

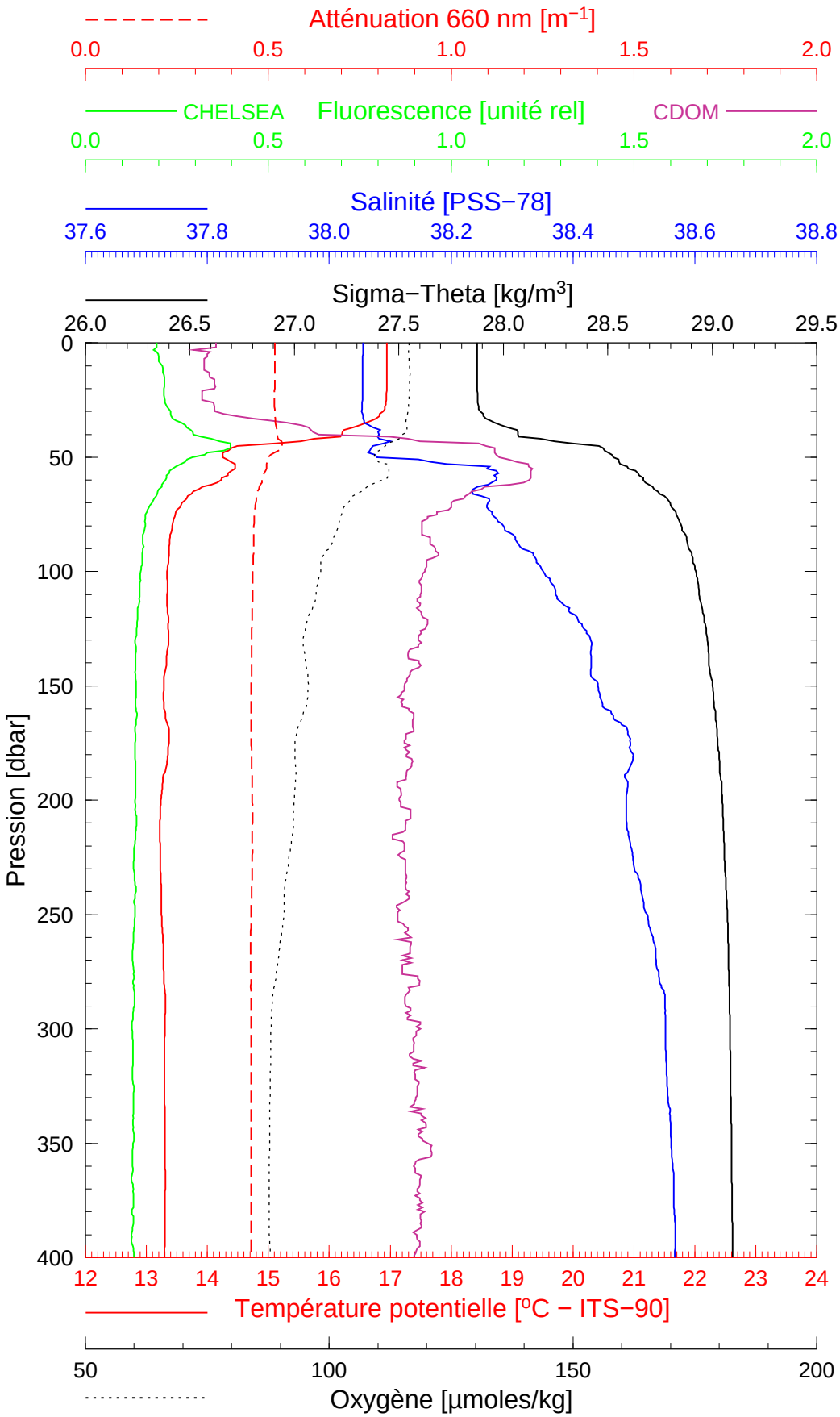


Date *07/11/2007* *Latitude* *43°21.797 N*

Heure déb *10h 30min [TU]* *Longitude* *07°53.643 E*

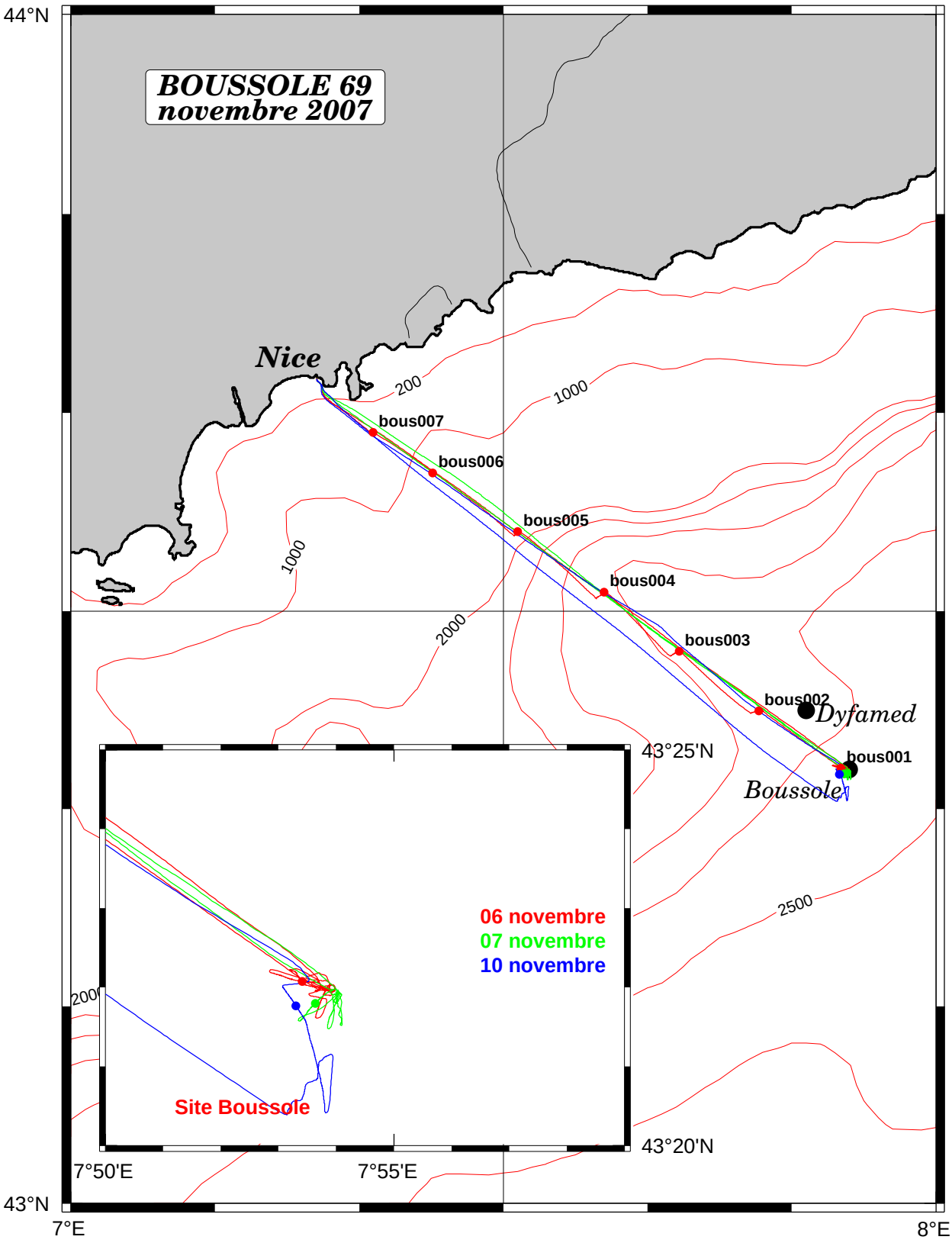
Boussole 69 **10/11/2007** **BOUS071110_09**

BOUS009

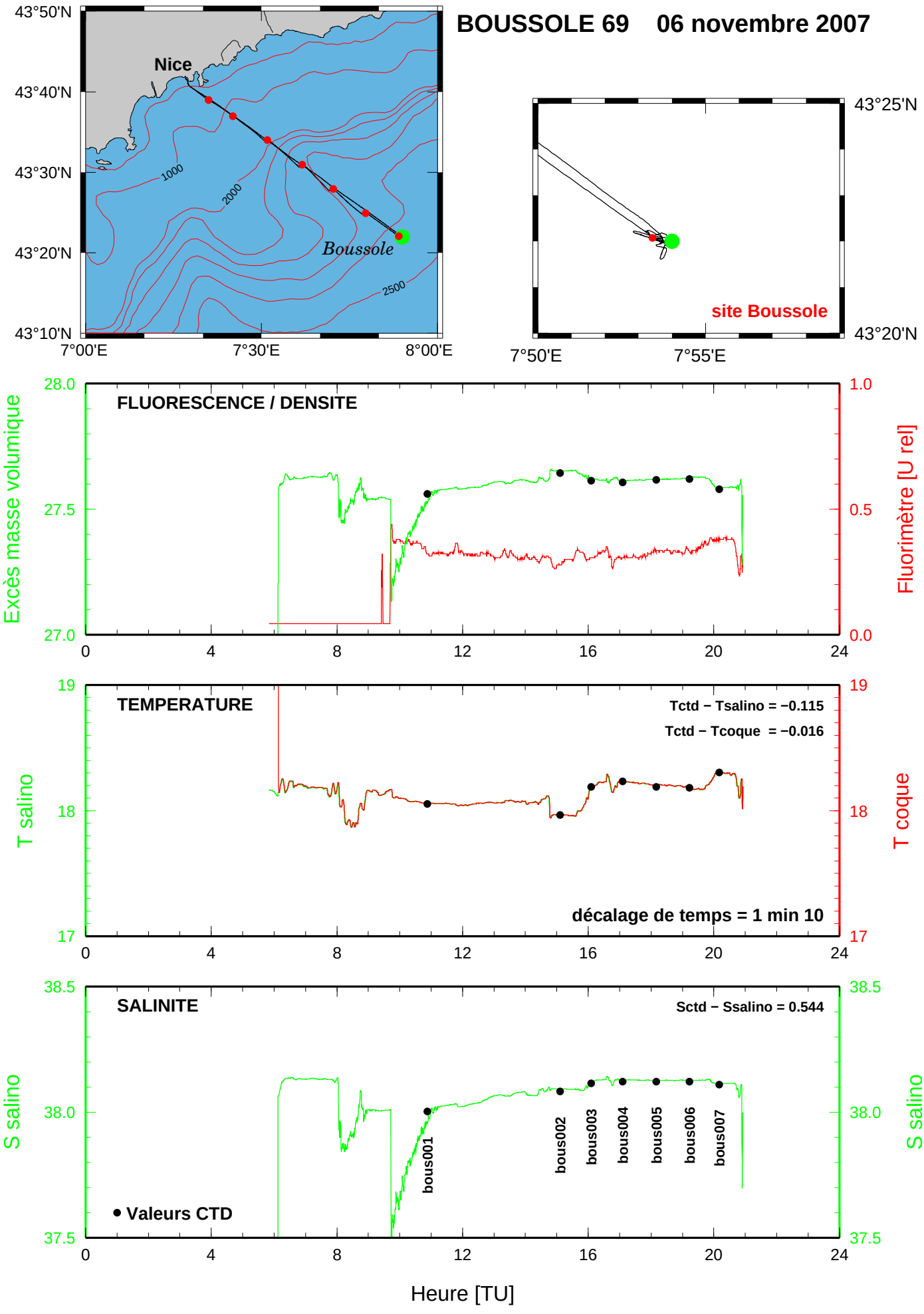


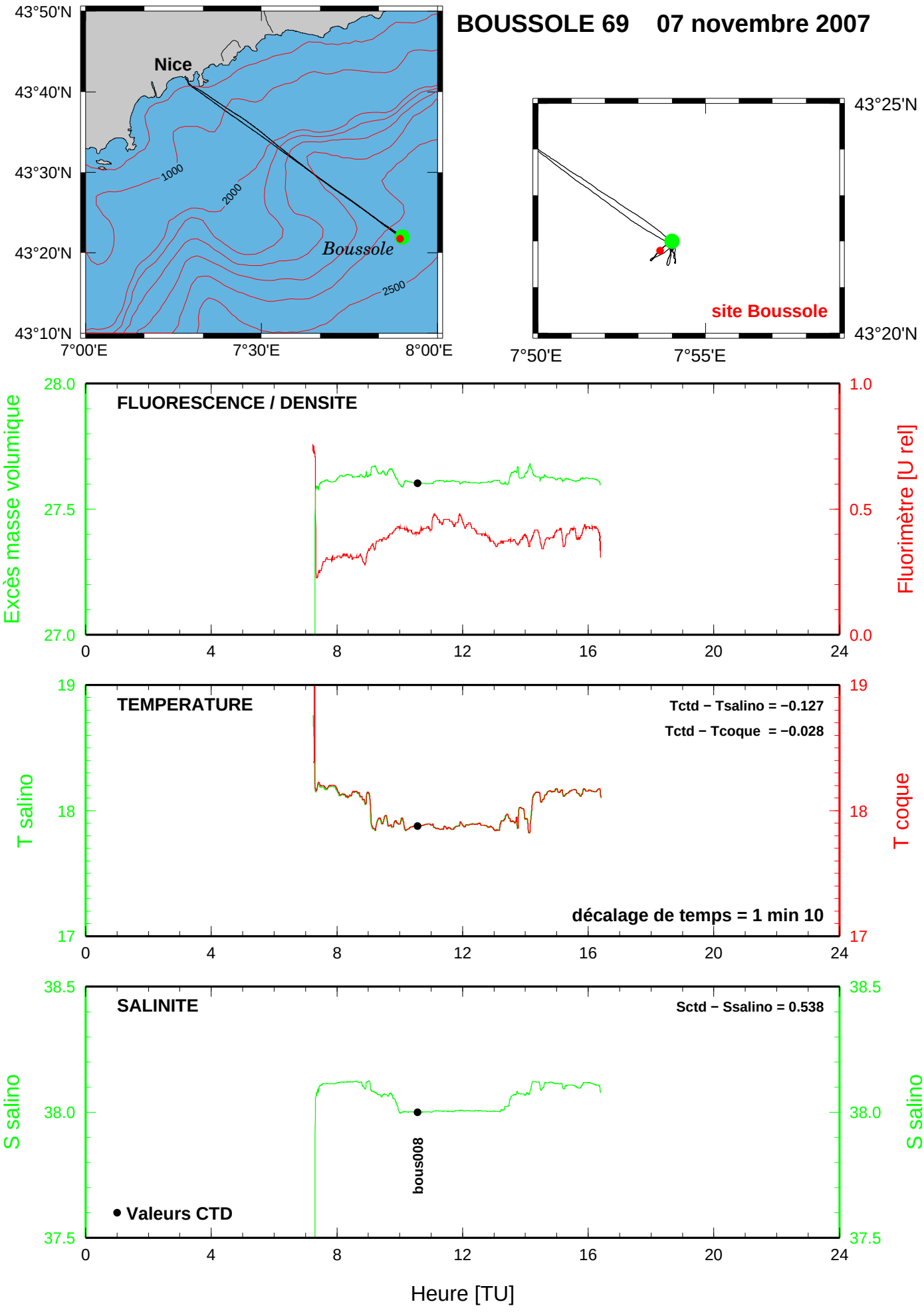
Date *10/11/2007* *Latitude* *43°21.769 N*

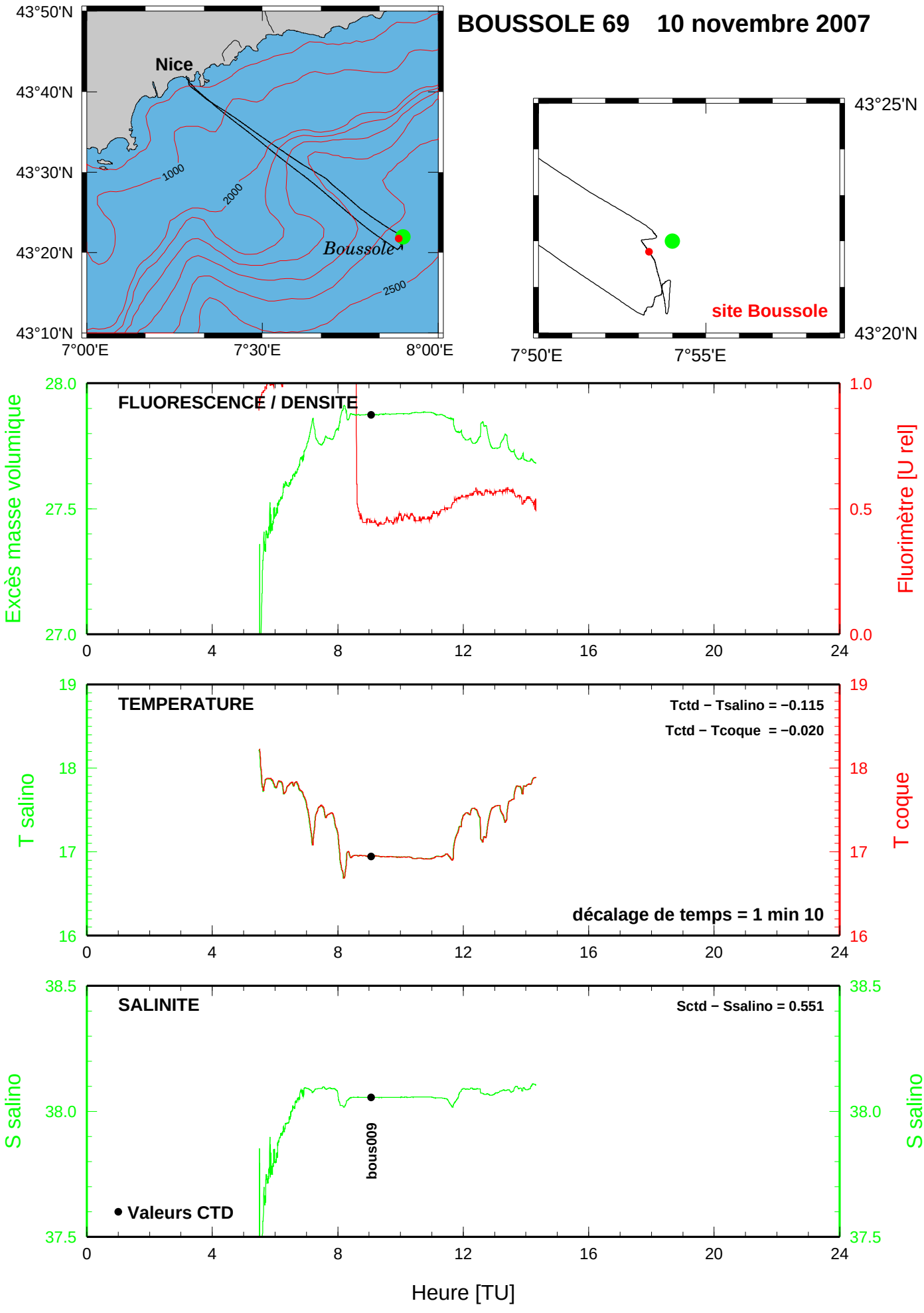
Heure déb *09h 03min [TU]* *Longitude* *07°53.302 E*



GMT 2007 Nov 26 18:43:15


BOUSSOLE 69 06 novembre 2007
Nice
Boussole
1000
2000
2500
43°50'N
43°40'N
43°30'N
43°20'N
43°10'N
7°00'E
7°30'E
8°00'E
43°25'N
43°20'N
7°50'E
7°55'E
site Boussole
FLUORESCENCE / DENSITE
Excès masse volumique
Fluorimètre [U rel]
TEMPERATURE
Tctd − Tsalino = −0.115
Tctd − Tcoque = −0.016
T salino
T coque
décalage de temps = 1 min 10
SALINITE
Sctd − Ssalino = 0.544
S salino
bous001
bous002
bous003
bous004
bous005
bous006
bous007
• Valeurs CTD
Heure [TU]


BOUSSOLE 69 07 novembre 2007
Nice
Boussole
1000
2000
2500
43°50'N
43°40'N
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
FLUORESCENCE / DENSITE
Excès masse volumique
Fluorimètre [U rel]
TEMPERATURE
Tctd − Tsalino = −0.127
Tctd − Tcoque = −0.028
décalage de temps = 1 min 10
T salino
T coque
SALINITE
Sctd − Ssalino = 0.538
bous008
• Valeurs CTD
S salino
Heure [TU]


BOUSSOLE 69 10 novembre 2007
Nice
Boussole
1000
2000
2500
43°50'N
43°40'N
43°30'N
43°20'N
43°10'N
7°00'E
7°30'E
8°00'E
43°25'N
43°20'N
7°50'E
7°55'E
site Boussole
FLUORESCENCE / DENSITE
Excès masse volumique
Fluorimètre [U rel]
TEMPERATURE
Tctd − Tsalino = −0.115
Tctd − Tcoque = −0.020
T salino
T coque
décalage de temps = 1 min 10
SALINITE
Sctd − Ssalino = 0.551
S salino
bous009
• Valeurs CTD
Heure [TU]