

# BOUSSOLE Monthly Cruise Report

## Cruise 68

October 07 - 10, 2007

Duty Chief: Guislain Bécu (guislain.becu@obs-vlfr.fr)

Vessel: R/V Téthys II

(Captain: Alain Stéfan)

Science Personnel: Guislain Bécu, Dominique Tailliez, Vincenzo Vellucci, Joséphine Ras, Amélie Gelay, Maéva Doron, David Luquet, Laurent Gilletta et Patrick Gobert.

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

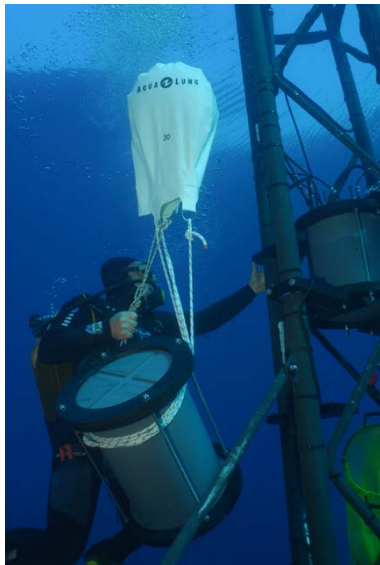


Fig 1. Patrick Gobert is bringing the battery back at the surface.

## BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

*October 15, 2007*



## 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

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<sub>2</sub> for HPLC pigment and particule absorption spectrophotometric filter analysis in the lab. A gimbed 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**

The buoy that was totally deployed (buoy + mooring) on September 22 and 23, 2007 did not start properly. Some incomplete ARGOS messages were received every 2 days, and no connection to the buoy from the ship was possible. So, 2 diving operations were organized to troubleshoot this problem.

## **Cruise Summary**

The weather conditions were rather good for this cruise, as all the days were used to work at sea.

The greatest part of the allocated ship time was used to troubleshoot the problem of the newly deployed BOUSSOLE buoy. Indeed, since its deployment on September 22 and 23, 2007, the system did not start and was just emitting a few ARGOS messages that were all incomplete. 2 diving operations were needed to fix the problem:

The first was achieved on October 07 by divers from the ex SAMAR company (Léo Gimenez and colleagues) on their own 12 meters ship. On that day, the DACNet was brought on the ship deck, and the MicroDrive was replaced by a new one, recently sent by Satlantic. Divers also lowered the buoy by 1.2 meter, fixed the ancient emergency ARGOS beacon, connected the strain gauge to strain-100 cable, and fixed a security strap between the upper and the lower parts of the buoy. Furthermore, the ARGOS beacon that is on the head of the buoy was also exchanged.

As the system did not start better since the first diving operations, a second one was organized on October 09, 2007. During this day, the battery and the CLC of the newly deployed system were replaced by the previous battery and CLC, the one that were recovered on September 23, 2007. Just 45 minutes after this operation, a connection to the buoy from the ship was possible, and the system started again its data acquisition and daily ARGOS messages were again received at the lab.

## Sunday 07 October 2007

Weather for this day was not optimal for the scheduled diving operations. Nevertheless, Léo Gimenez and colleagues worked hard to perform the few maintenance activities that were needed for the buoy (see above). After this work, 1 CTD cast, 3 SPMR profiles and some connection attempts to the buoy were realized. MVD surface, HOCl-Es surface and ARGOS beacon contacts were also cleaned.

## Monday 08 October 2007

Weather for this day was better, less wind and especially a smaller swell. Activities performed this day were 7 CTD casts (among which 6 were realized on the transect between the port of Nice and the BOUSSOLE site). As the connections to the buoy attempts were always unsuccessful, it was decided to halt all the others measurement activities to fetch the old DACNet to the LOV and to configure it in the ship lab to fit the new buoy system (HyperSpectral instrumentation).

## Tuesday 09 October 2007

Again, this day was used for diving operations exclusively. Divers exchanged the battery and the CLC, and recover the emergency ARGOS beacon (to connect its battery, that was forgotten during the first day). These buoy maintenance activities were finished in the early beginning of the afternoon, the system started again properly, but the wind raised till 23 knots and prevented the others measurements activities.

## Wednesday 10 October 2007

This day was the first day entirely used for standard BOUSSOLE cruises activities. Weather conditions were not ideal, but allow to perform 1 CTD cast (for HPLC, Ap and CDOM), 1 water sampling for TSM, 1 Secchi disk and 3 SPMR profiles. Some reflective scotch tape was stuck on the top of the buoy upper structure, before leaving for the port of Nice. On the transect, 8 "PTR" and 2 "IFR" buoys were deployed for François Parthiot (CEDRE) on 3 points, one before the Ligurian current, one in the Ligurian current, and one after the Ligurian current.

## Cruise Report

### 07 October 2007 (UTC)

- 0415 Departure from the port of Nice.
- 0730 Arrival at the BOUSSOLE site.
- 0815 Connection attempt to the buoy: unsuccessful. Wait for the divers that are supposed to arrive between 0800 and 1000.
- 0840 Divers arrive and perform the following operations: recover the DACNet, put a security strap between the lower and the upper parts of the buoy, lower the entire structure of 1.2 meter, put an anode just below the sphere, put again the emergency ARGOS beacon under the sphere, connect the strain gauge and the strain-100 with an appropriate cable and finally install and connect again the DACNet, after the MicroDrive has been exchanged with a brand new one.
- 1224 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.
- 1300 Top of the buoy ARGOS beacon electric contacts cleaning, MVD and HOCl-Es optical surfaces cleaning.
- 1356 SPMR profiles 01, 02, 03.
- 1515 Connection attempt to the buoy: unsuccessful again! Try to get the connection by turning around the buoy with the ship till 1620, but no signal from the buoy.

### 08 October 2007

- 0637 CTD 02, 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.
- 0715 Connection attempt to the buoy: unsuccessful...
- 0815 Direct connection attempt from the top of the buoy: unsuccessful, despite some network activity detected). Top of the buoy ARGOS beacon exchange (put the recently recovered one). Output voltage of the solar panels junction box measurements: 19.2 Volts (nominal).
- 0909 CTD 03, 400 m, station 01 (43°25'N 07°48'E).

1009 CTD 04, 400 m, station 02 (43°28'N 07°42'E).  
1107 CTD 05, 400 m, station 03 (43°31'N 07°37'E).  
1204 CTD 06, 400 m, station 04 (43°34'N 07°31'E).  
1303 CTD 07, 400 m, station 05 (43°37'N 07°25'E).  
1349 CTD 08, 400 m, station 06 (43°39'N 07°21'E).  
1440 Arrival at the port of Nice.

## 09 October 2007

0445 Departure from the port of Nice.  
0800 Divers at Sea to exchange the battery and the CLC with the ancient ones. They also recover the emergency ARGOS beacon to connect the battery.  
0920 GB and VV put the ancient buoy battery in the new flange (to fit in the new buoy structure) and open the emergency ARGOS beacon to connect its battery.  
1020 Divers at sea to install the battery and the ARGOS beacon. The wind is rising up to 23 knots...  
1115 Connection to the buoy: successful, files seem to be coherent.  
1125 Departure from the BOUSSOLE site.  
1430 Arrival at the port of Nice.

## 10 October 2007

0430 Departure from the port of Nice.  
0745 Arrival to the BOUSSOLE site.  
0751 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 and Ap and CDOM.  
1015 Connection to the buoy: successful.  
1024 water sampling at 5 meters (with the rosette) for TSM.  
1055 VV put reflective scotch tape on the top of the buoy.  
1105 Secchi disk 01, close to the buoy, 18.5 meters.  
1157 SPMR profiles 04, 05 and 06.  
1235 Departure from the BOUSSOLE site.  
1408 Deployment of 3 "PTR" buoys (for François Parthiot, CEDRE).  
1437 Deployment of 2 "PTR" buoys and one "IFR" buoy.  
1459 Deployment of 3 "PTR" buoys and one "IFR" buoy.  
1545 Arrival to the port of Nice.

# Calculated Swath paths for the MERIS Sensor (ESOV Software)

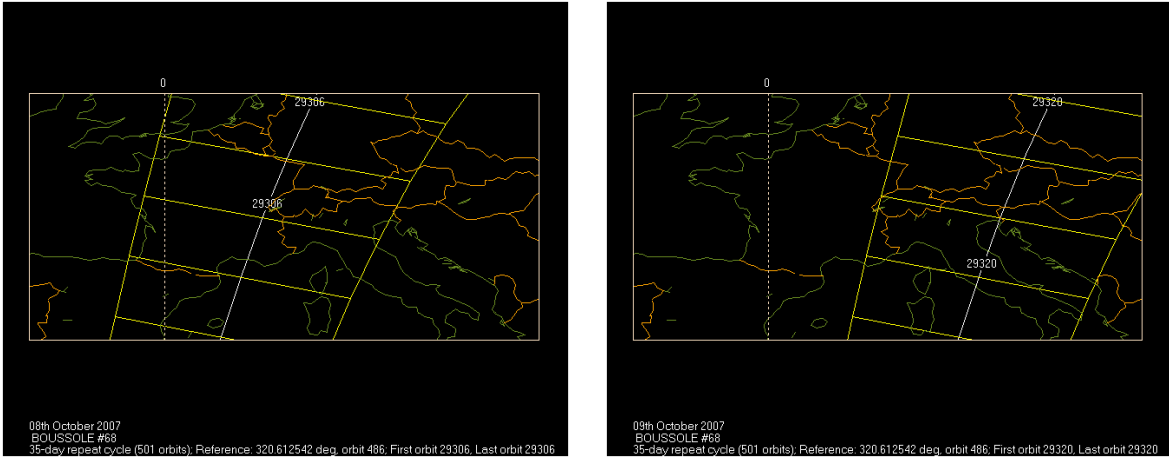
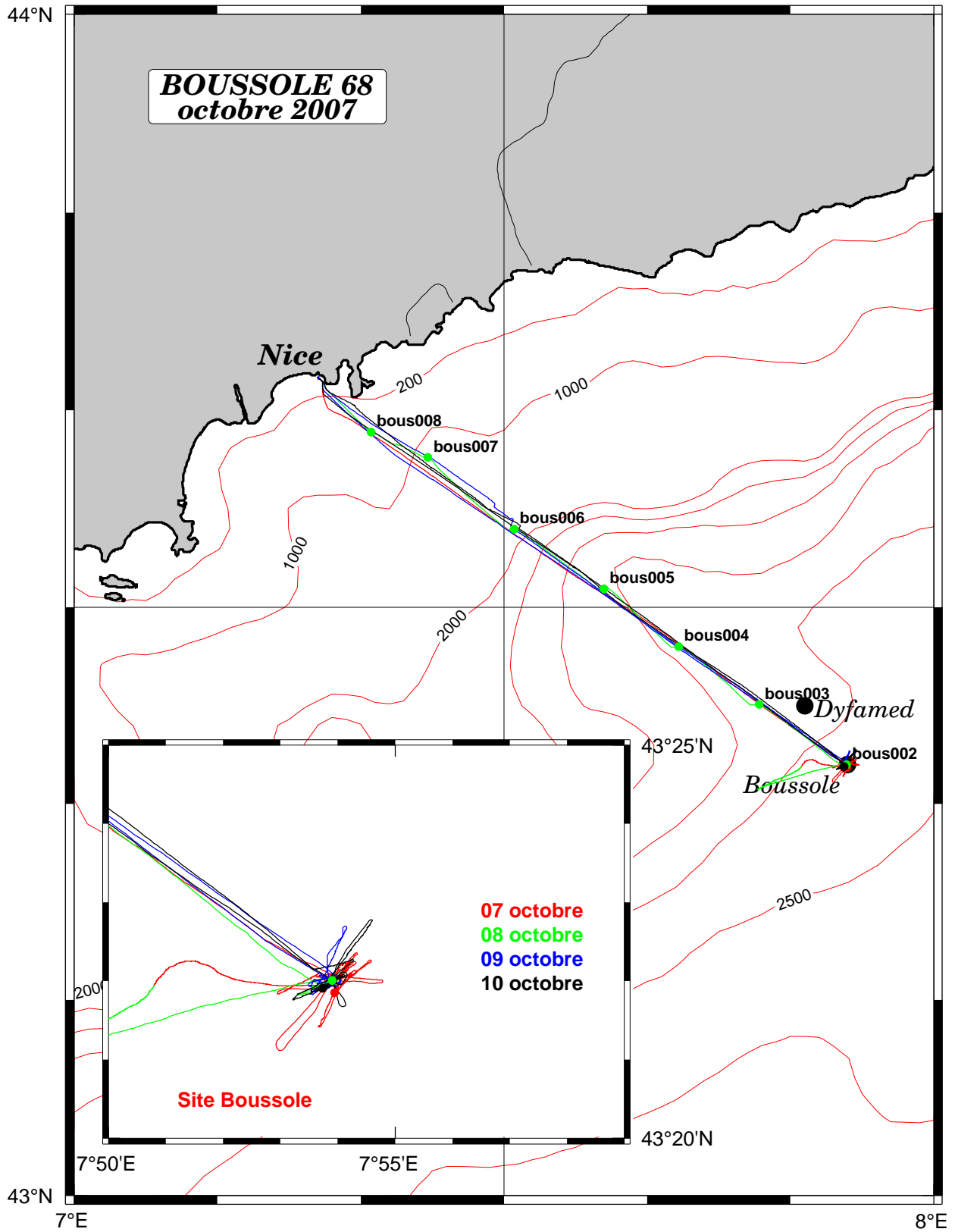


Figure 2. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for October 08 and 09, 2007.

# Appendix





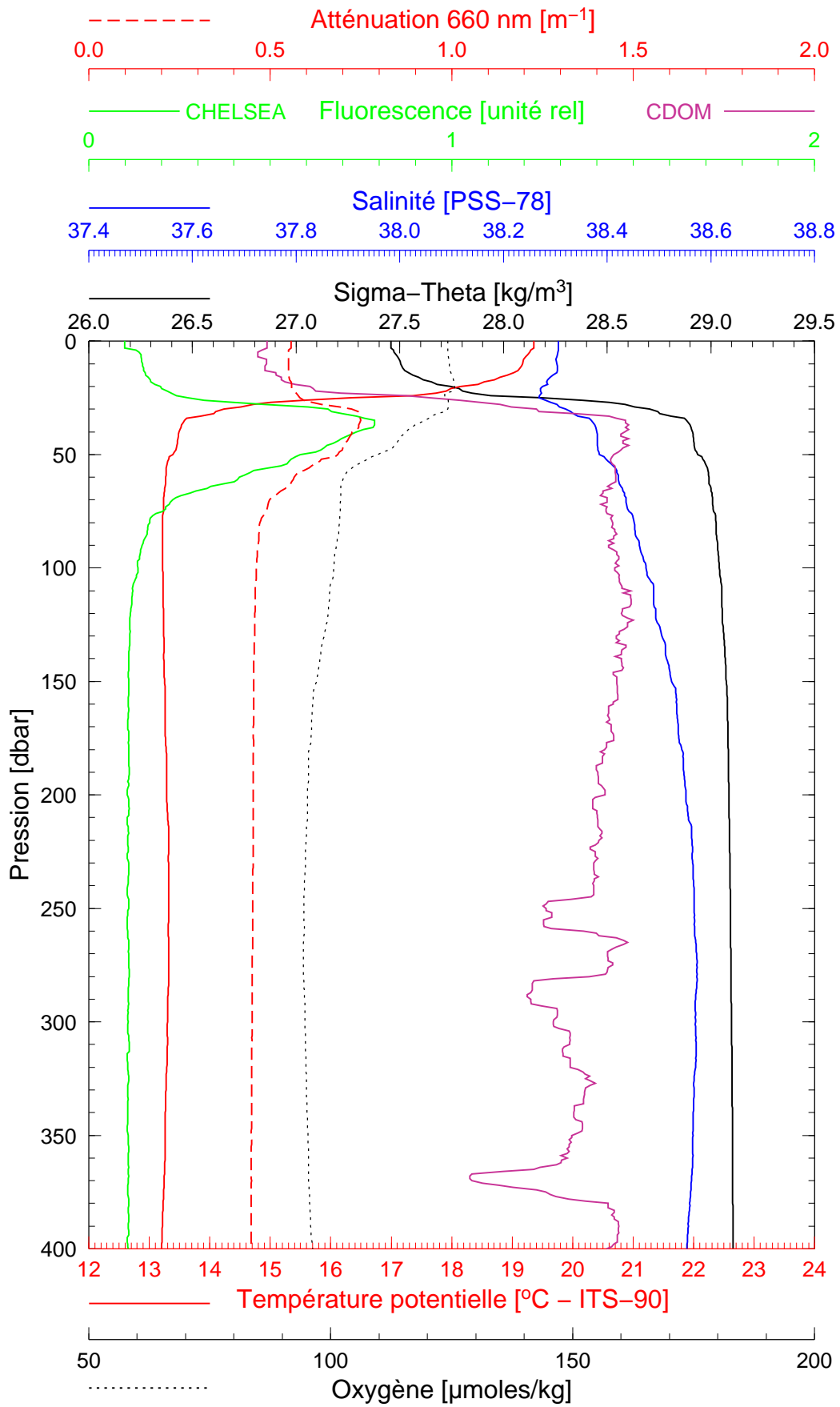


Boussole 68

07/10/2007

BOUS071007\_01

BOUS001



Date 07/10/2007

Latitude 43°21.855 N

Heure déb 12h 24min [TU]

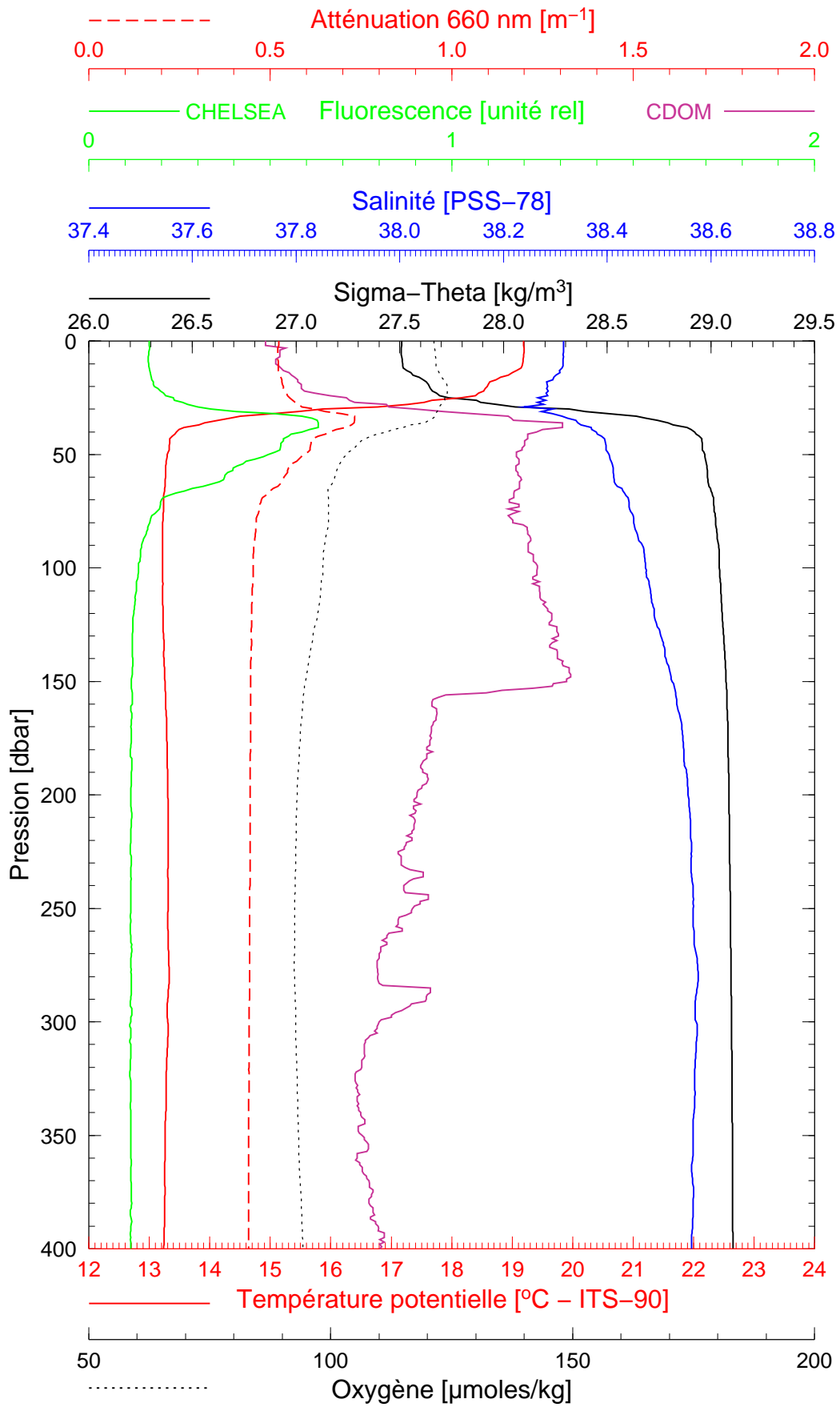
Longitude 07°53.949 E

Boussole 68

08/10/2007

BOUS071008\_01

BOUS002



Date 08/10/2007  
Heure déb 06h 37min [TU]

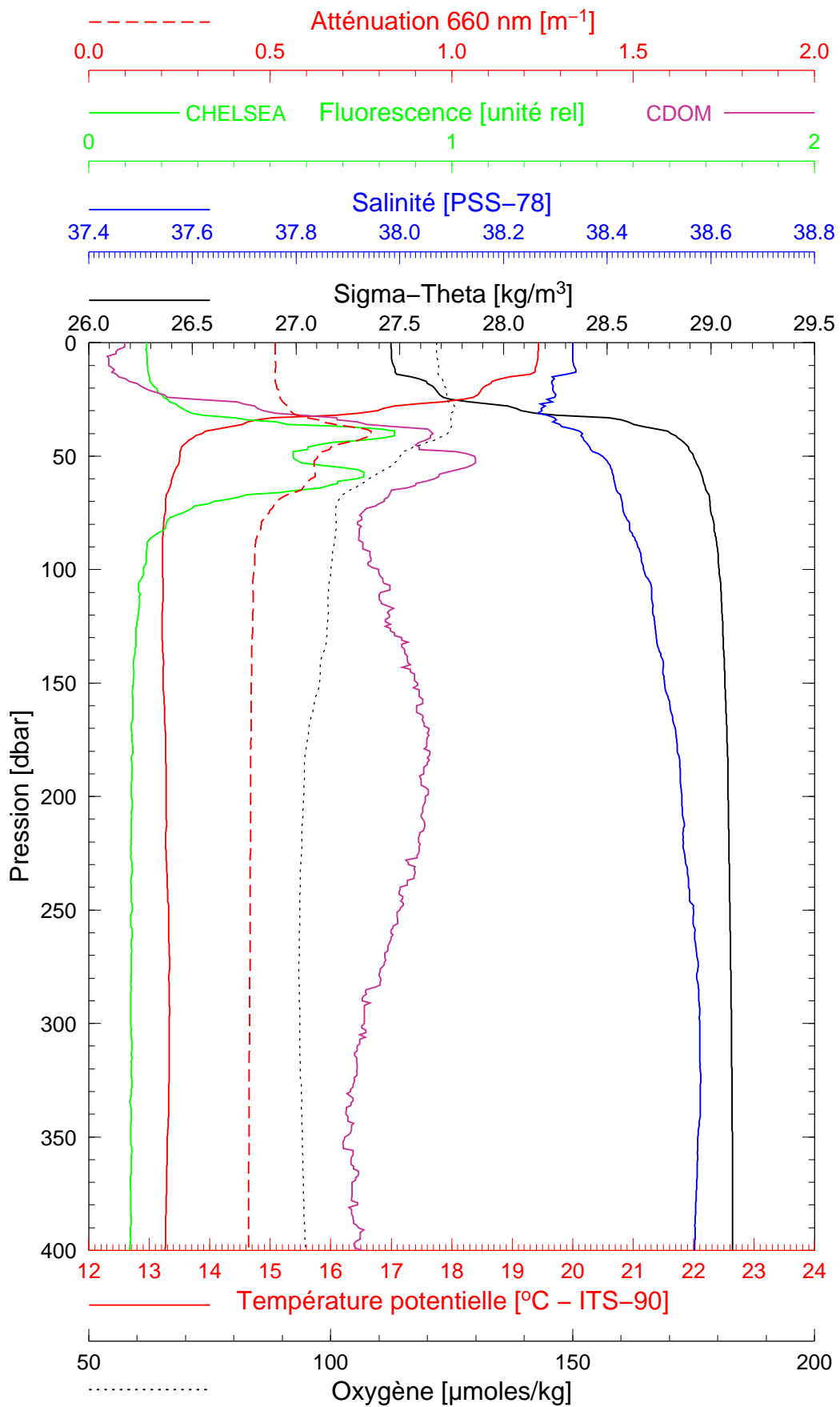
Latitude 43°22.005 N  
Longitude 07°53.902 E

Boussole 68

08/10/2007

BOUS071008\_02

BOUS003



Date 08/10/2007

Latitude 43°25.061 N

Heure déb 09h 09min [TU]

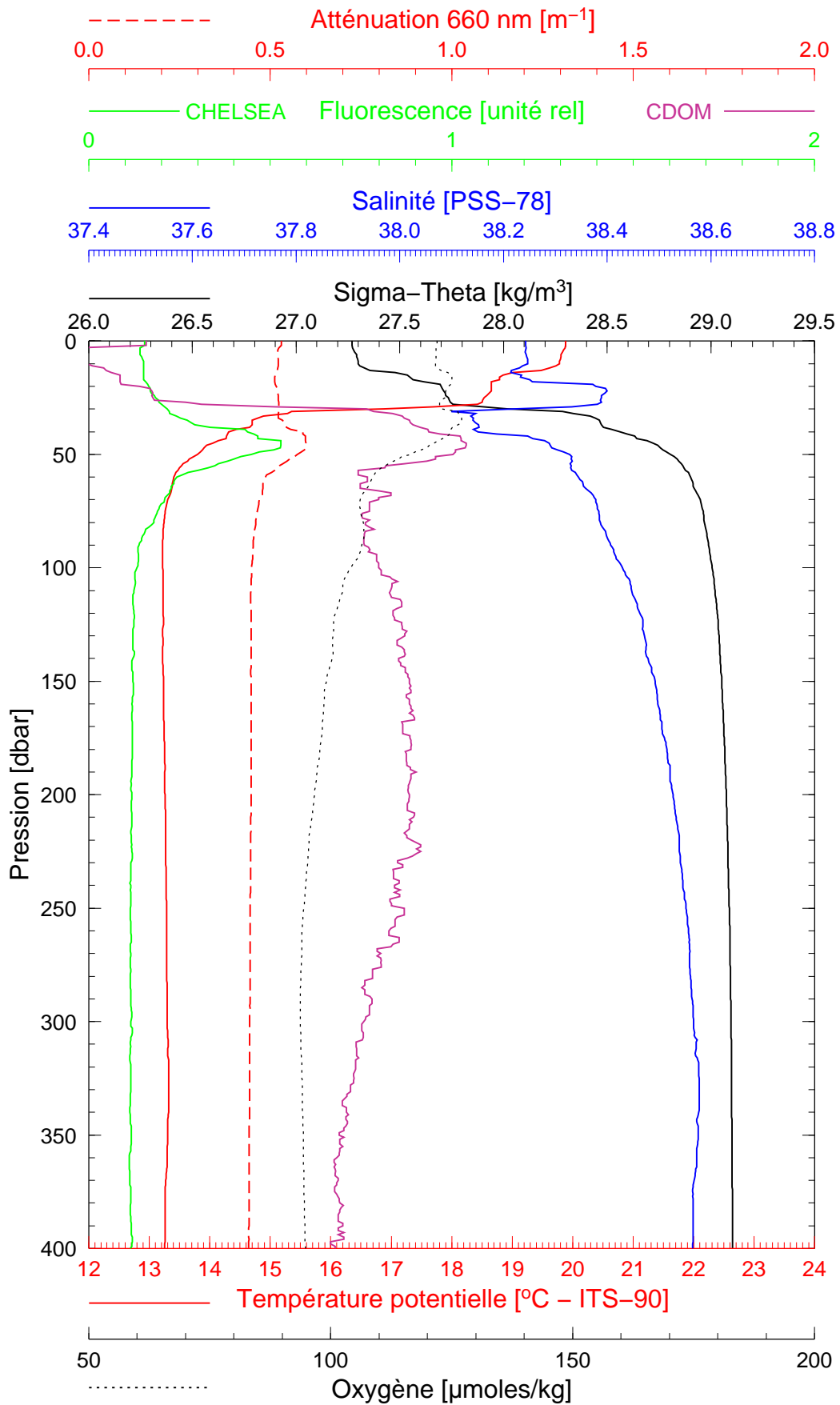
Longitude 07°47.808 E

Boussole 68

08/10/2007

BOUS071008\_03

BOUS004



Date 08/10/2007  
Heure déb 10h 09min [TU]

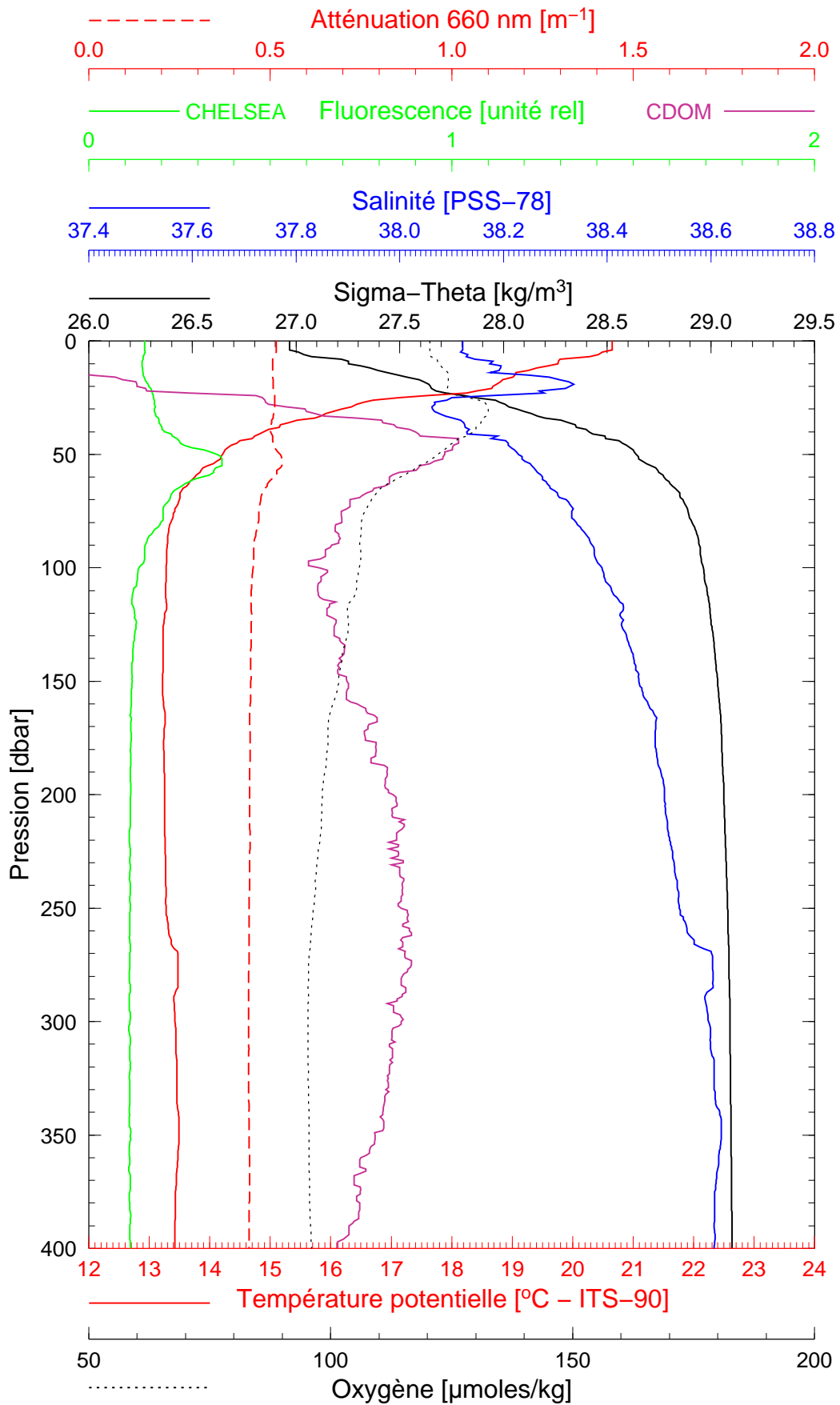
Latitude 43°27.994 N  
Longitude 07°42.188 E

Boussole 68

08/10/2007

BOUS071008\_04

BOUS005



Date 08/10/2007  
Heure déb 11h 07min [TU]

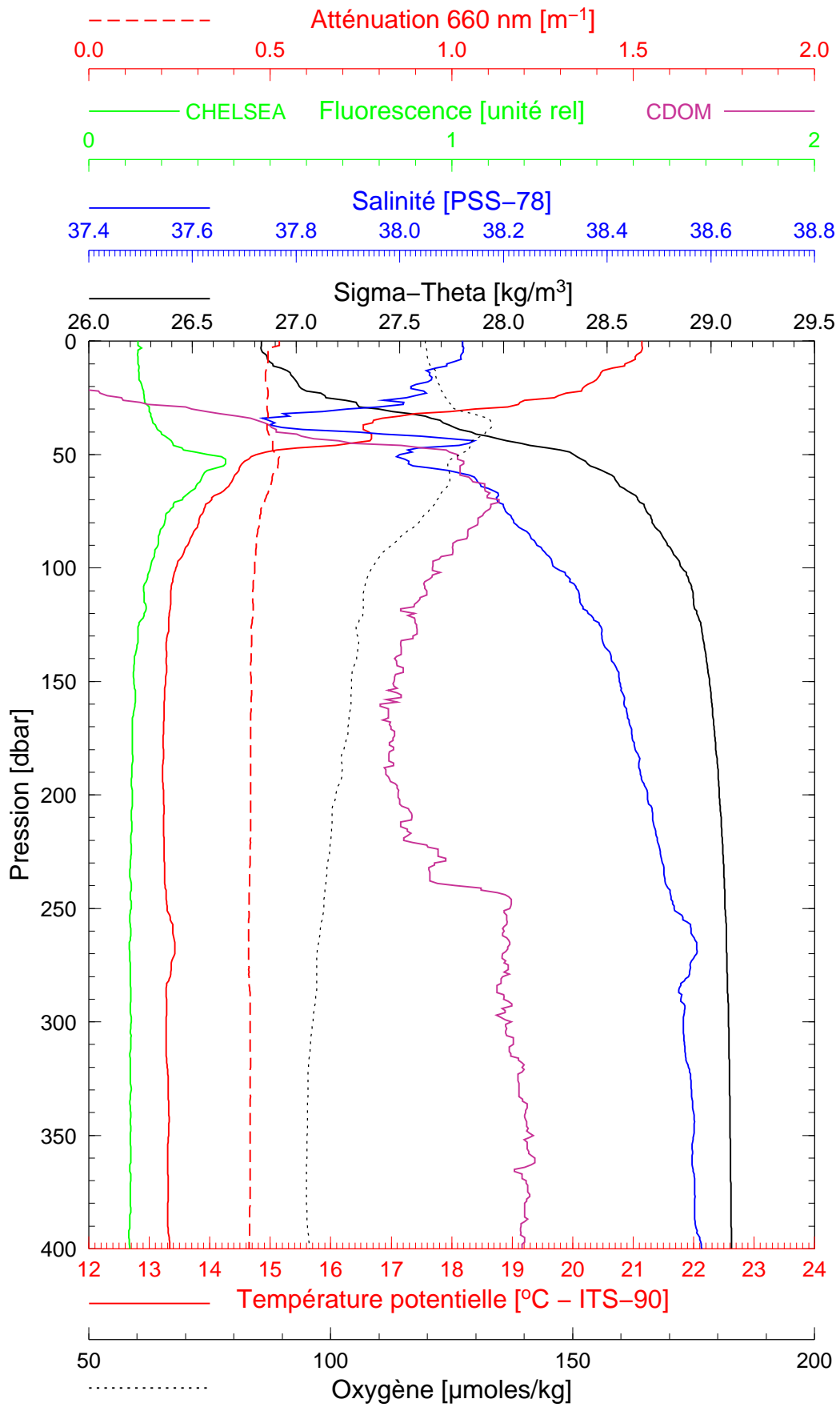
Latitude 43°30.947 N  
Longitude 07°36.981 E

Boussole 68

08/10/2007

BOUS071008\_05

BOUS006



Date 08/10/2007  
Heure déb 12h 04min [TU]

Latitude 43°33.972 N  
Longitude 07°30.732 E

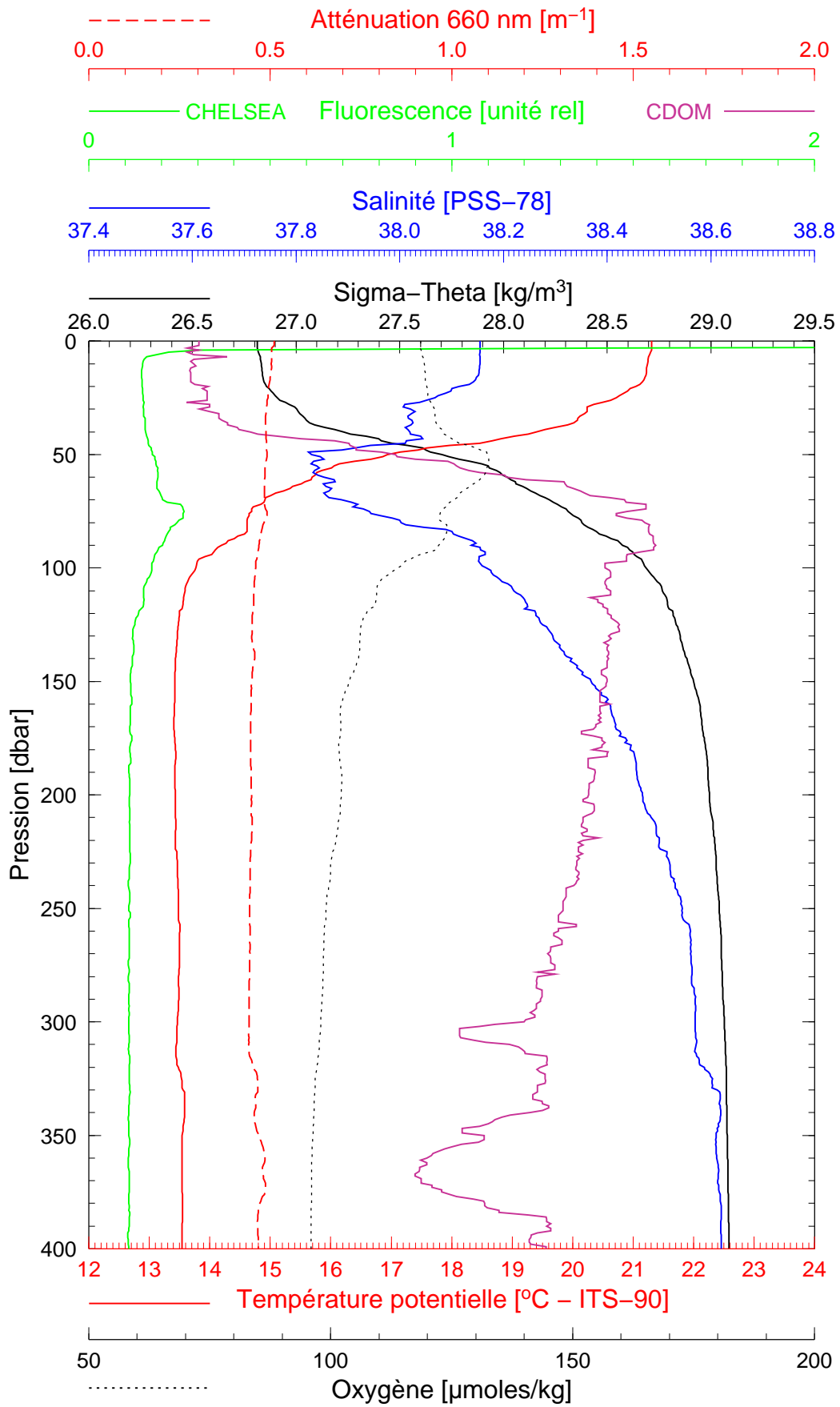


Boussole 68

08/10/2007

BOUS071008\_06

BOUS007



Date 08/10/2007  
Heure déb 13h 03min [TU]

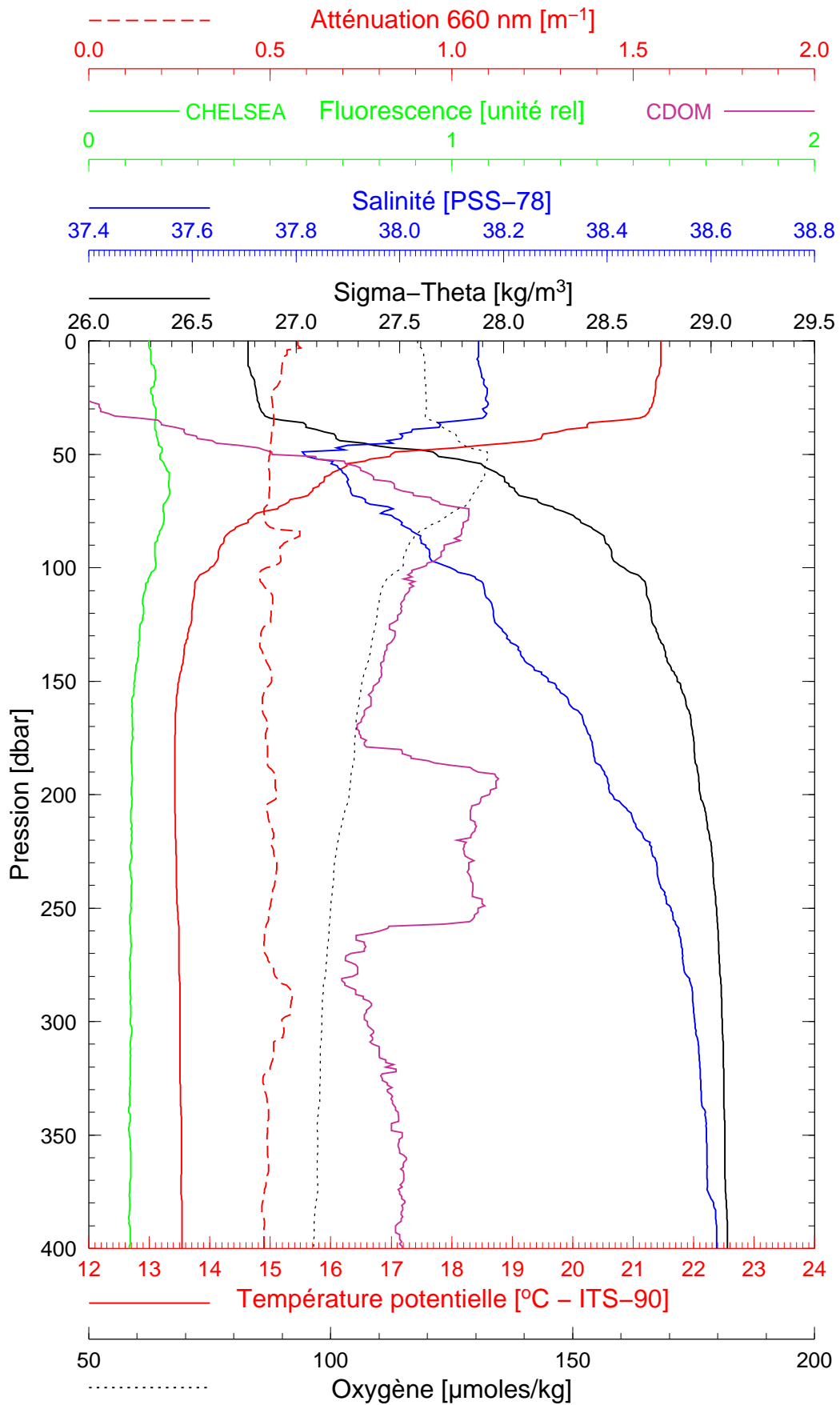
Latitude 43°37.606 N  
Longitude 07°24.703 E

Boussole 68

08/10/2007

BOUS071008\_07

BOUS008



Date 08/10/2007

Latitude 43°38.897 N

Heure déb 13h 49min [TU]

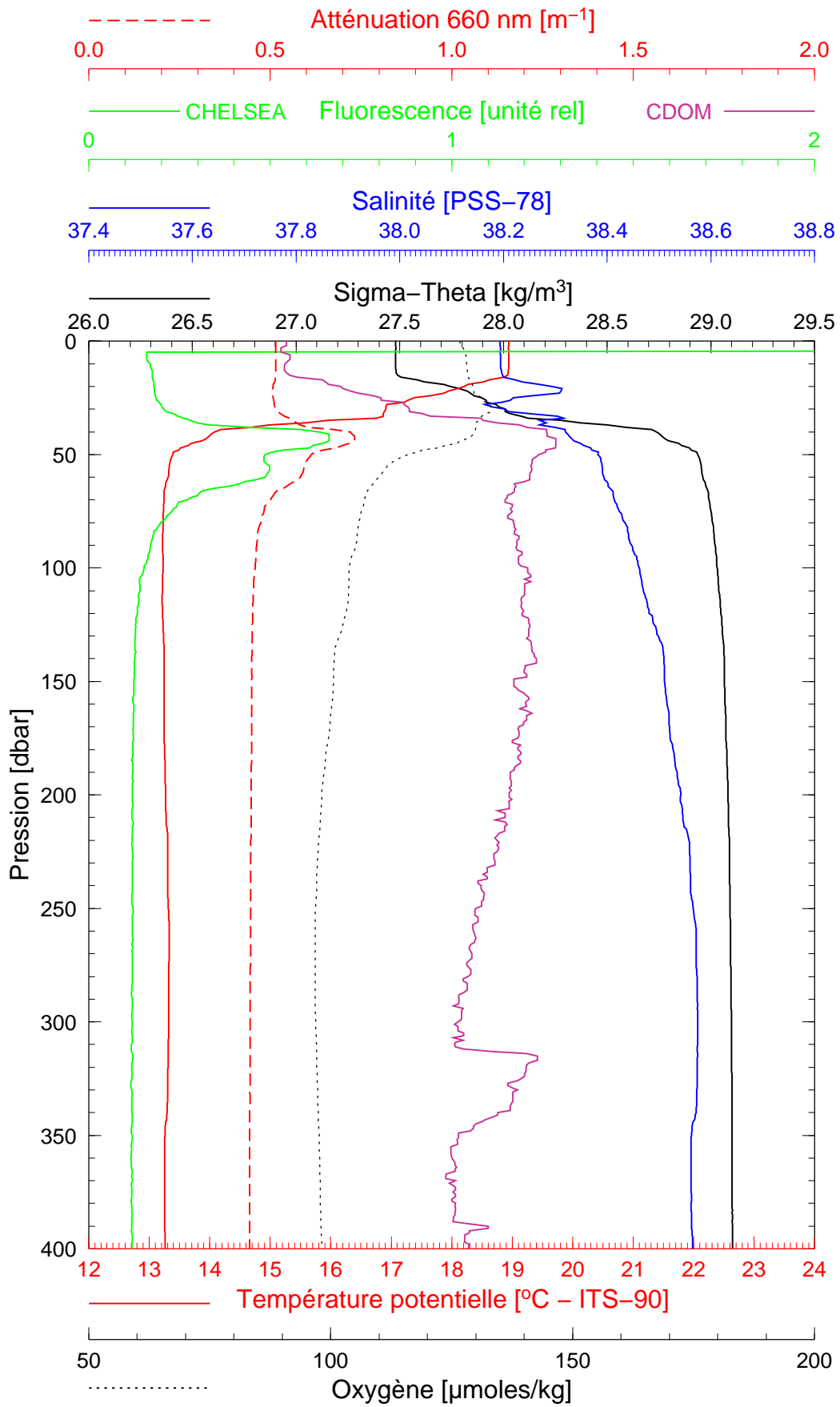
Longitude 07°20.710 E

Boussole 68

10/10/2007

BOUS071010\_01

BOUS009



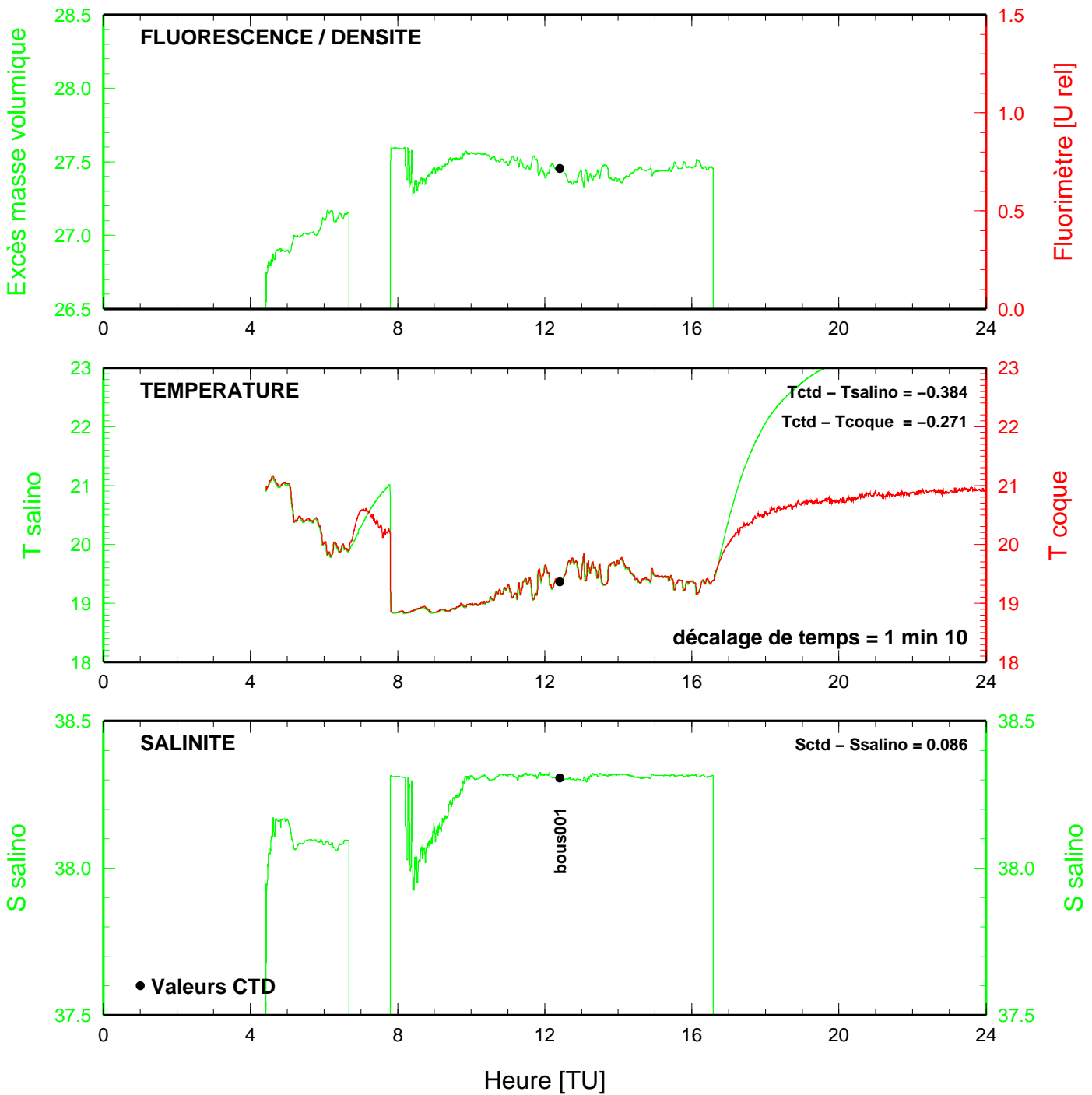
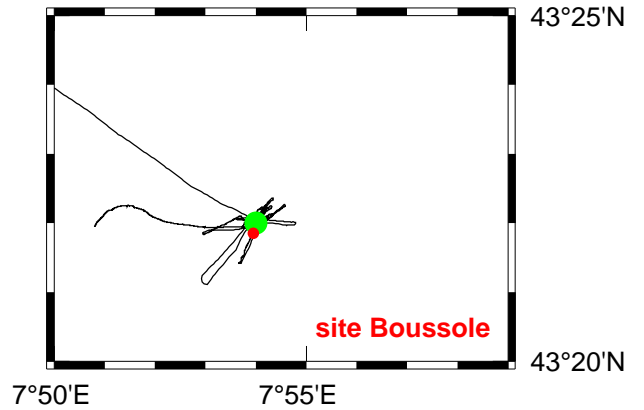
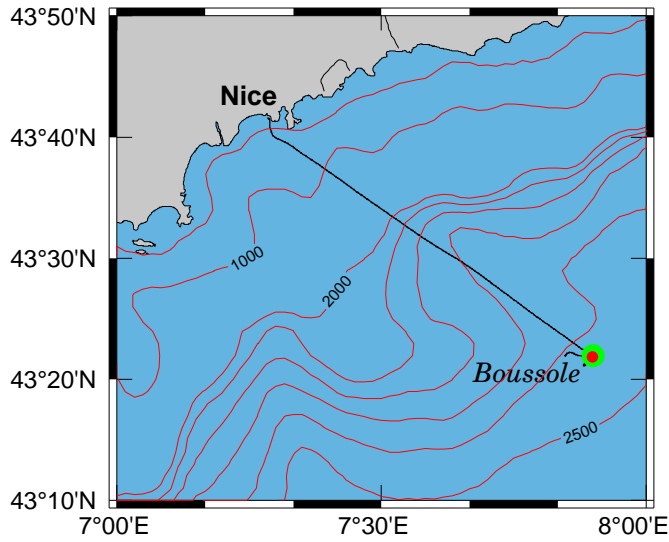
Date 10/10/2007

Latitude 43°21.912 N

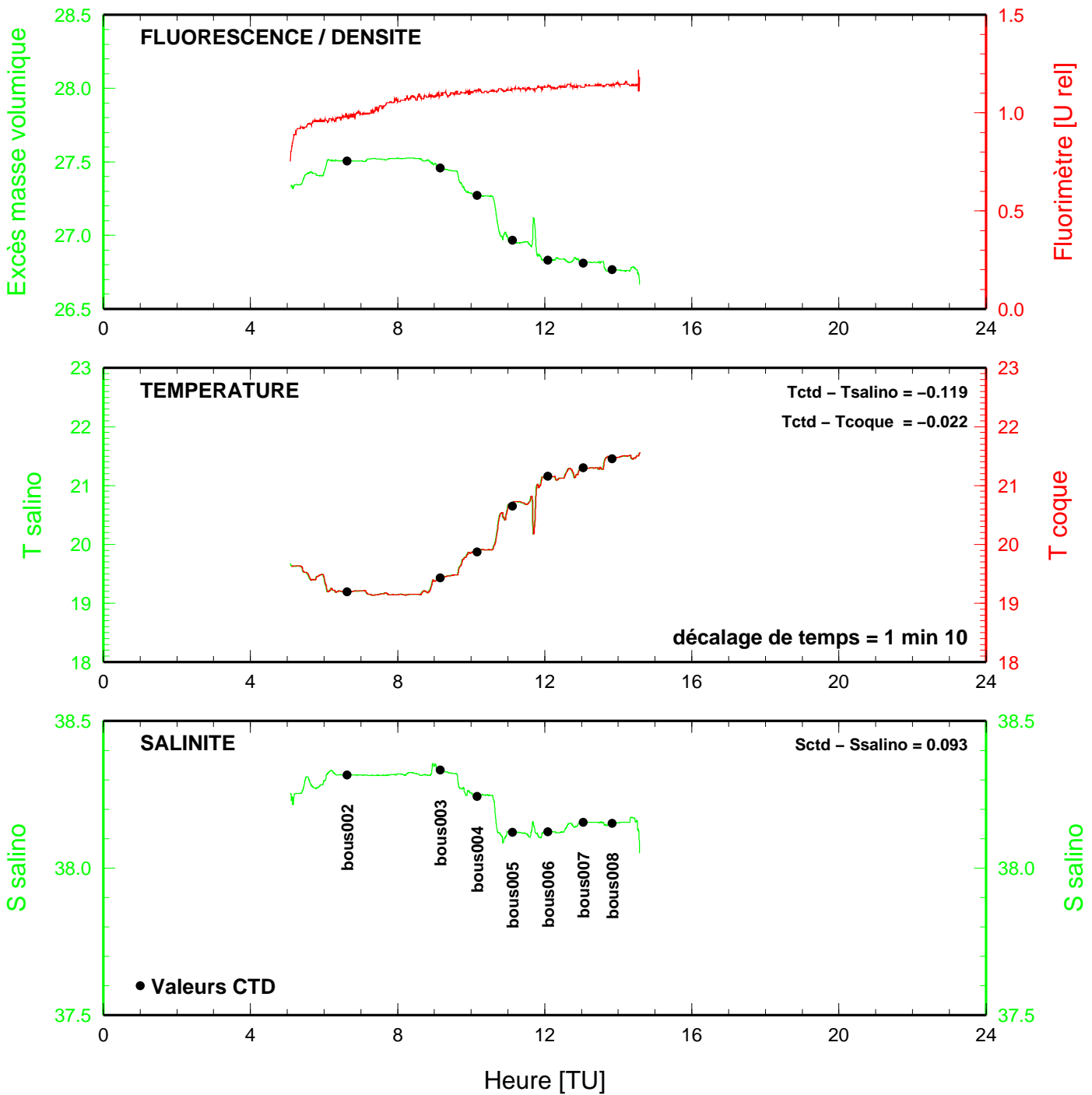
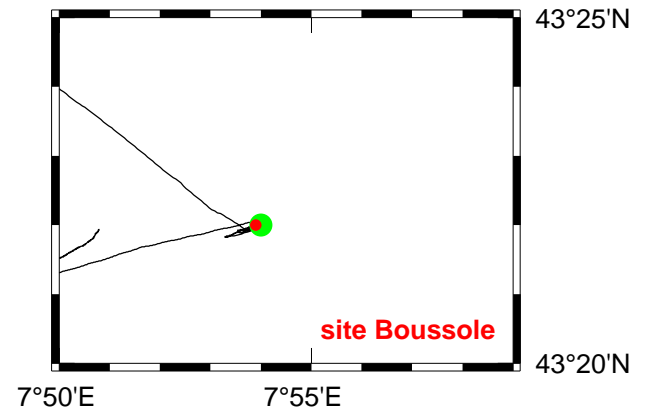
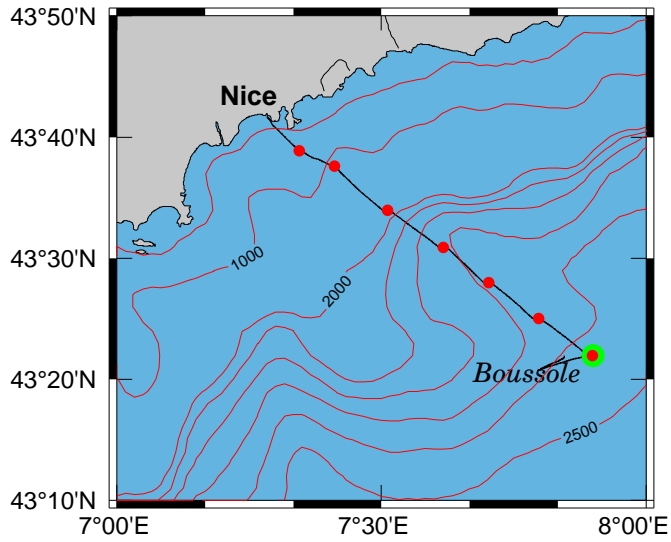
Heure déb 07h 51min [TU]

Longitude 07°53.738 E

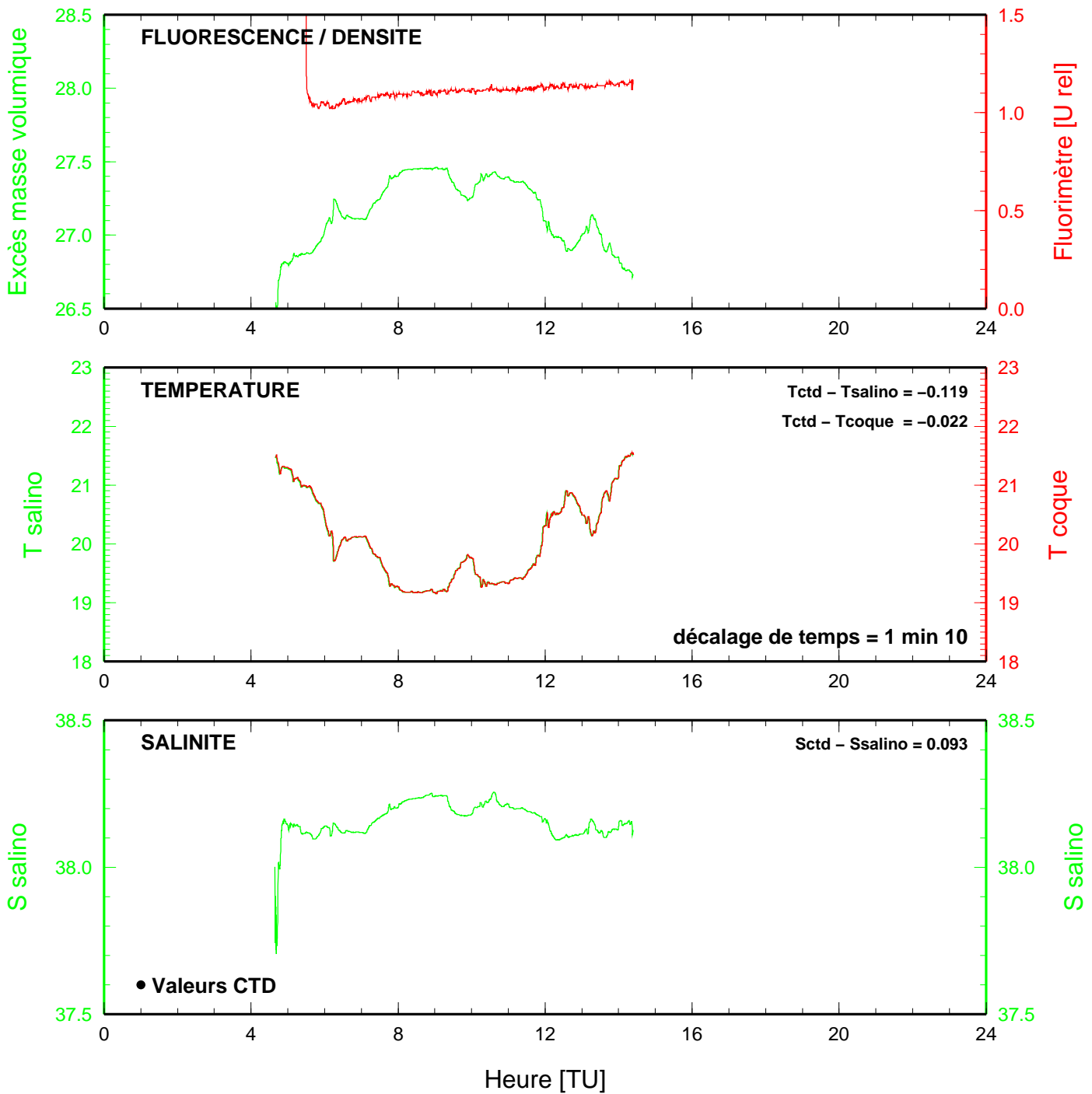
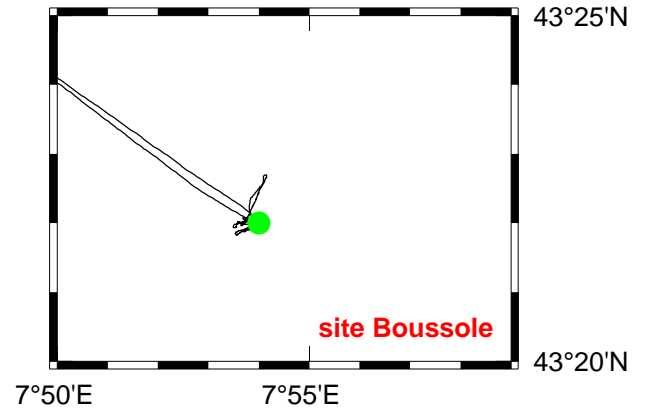
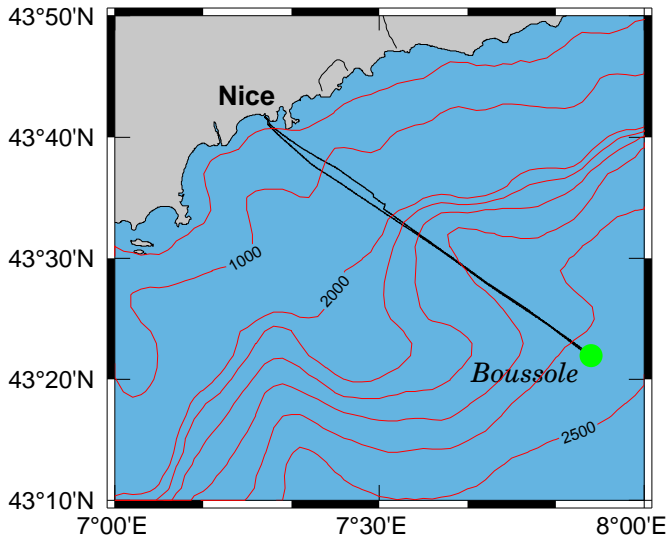
# BOUSSOLE 68 07 octobre 2007



**BOUSSOLE 68 08 octobre 2007**



# BOUSSOLE



# BOUSSOLE 68 10 octobre 2007

