

# BOUSSOLE Monthly Cruise Report

**Cruise 148**

**June 14 – 17, 2014**

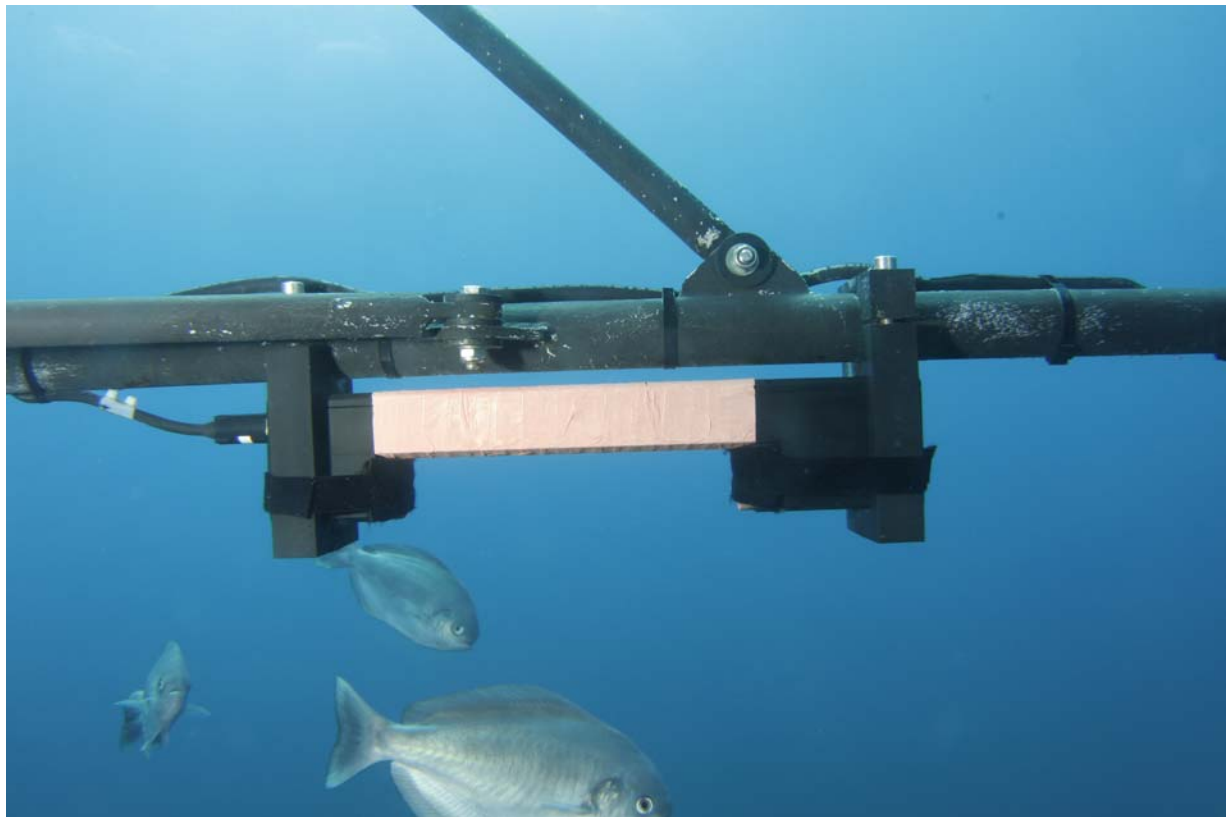
Duty Chief: Melek Golbol ([golbol@obs-vlfr.fr](mailto:golbol@obs-vlfr.fr))

Vessel: R/V Téthys II

(Captain: Joël Perrot)

**Science Personnel:** Jean De Vaugelas, Emilie Diamond, Melek Golbol, Stéphane Jamme, Yves Lamblard, Sabine Marty, Lucie Millet, Vincent Taillandier and Mehmet Yayla.

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



Dark current measurement of the transmissometer installed on the BOUSSOLE buoy at 9m depth.

**BOUSSOLE project**

**ESA/ESRIN contract N° 13226/10/I-NB**

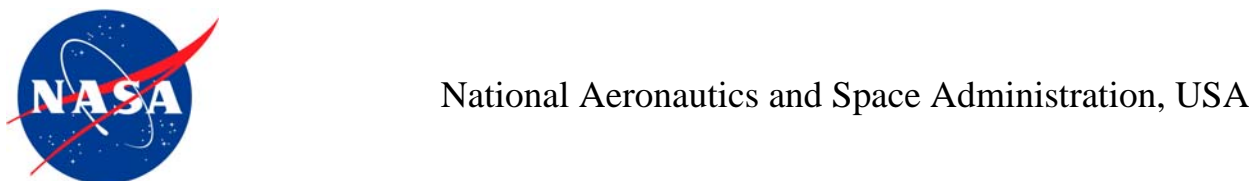
*June 25, 2014*



## 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



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## Cruise Objectives

### Routine operations

Multiple Biospherical's C-OPS (Compact Optical Profiling System) radiometric profiles are performed at the BOUSSOLE site 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 C-OPS 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. CTD deployments are required at the start and the end of the C-OPS profiling day and around noon in the longer summer days or when there is a high possibility of a satellite matchup. The CTD package also includes a Chl fluorometer. Additional instrumentation for measurement of inherent optical properties has been added from December 2011. The package includes a hyperspectral absorption meter (Hobilabs a-sphere), a multispectral backscattering meter (Hobilabs Hydrosat-6) and a multispectral beam transmissometer (Hobilabs Gamma-4). Seawater samples are to be collected, filtered and stored into liquid nitrogen for subsequent HPLC pigment and particle absorption spectrophotometric filter analysis in the lab. Three replicates samples are to be collected at surface for total suspended matter weighting in the lab.

Operations that have to be performed in each cruise include:

- Collection and filtration of seawater samples for colored dissolved organic matter (from June 2005).
- One CTD transect is performed between the BOUSSOLE site and the Port of Nice. This transect consists of six fixed stations on-route from BOUSSOLE (see map in appendix). Whenever feasible, this transect should be performed at a similar time for each cruise, in order to minimise the influence of possible diurnal variability.
- Divers check the underwater state of the buoy structure and instrumentation, take pictures for archiving, clean the sensor optical surfaces, and then take again some pictures after cleaning. Divers also put a neoprene cap on the backscattering meter and on the transmissometers for acquiring dark measurements (started in April 2009).

In addition, water samples are to be collected at two depths (5m and 10m) for total alkalinity (AT) and total inorganic carbon (CT) analysis (from March 2014). This operation is part of the BIOCAREX ANR project, in collaboration with the LOCEAN in Paris (J. Boutin and collaborators). The samples will be processed by the National service for such analyses (SNAPOCO – LOCEAN in Paris). The results will allow checking the data collected by the two pCO<sub>2</sub> CARIOCA sensors installed on the buoy at 3m and 10m.

Further details about these operations and the data collection and processing protocols are to be found in: Antoine, D. M. Chami, H. Claustre, F. D'Ortenzio, A. Morel, G. Bécu, B. Gentili, F. Louis, J. Ras, E. Roussier, A.J. Scott, D. Tailliez, S. B. Hooker, P. Guevel, J.-F. Desté, C. Dempsey and D. Adams. 2006, BOUSSOLE: a joint CNRS-INSU, ESA, CNES and NASA Ocean Color Calibration And Validation Activity. NASA Technical memorandum N° 2006 - 214147, 61 pp.

[http://www.obs-vlfr.fr/Boussole/html/publications/pubs/BOUSSOLE\\_TM\\_214147.pdf](http://www.obs-vlfr.fr/Boussole/html/publications/pubs/BOUSSOLE_TM_214147.pdf)

### Additional operations

Mehmet Yayla from the Sète IFREMER laboratory was on board for being trained on deployment of the C-OPS profiler. The two last days bad weather prevented working at the BOUSSOLE site. The weather was better closer to the coast, so we took advantage of the third day to make several optical profiles tests in the bay of Villefranche-sur-mer.

## Cruise Summary

The first day was used to perform the diving operations, to retrieve data from the buoy, to perform a CTD cast with water sampling, optical profiles and a Secchi disk at the BOUSSOLE site. The CTD transect was performed partially. The second day bad weather prevented departure from the Nice harbour. The third day, bad weather prevented work at BOUSSOLE site. This day was nevertheless used to perform optical profiles in the bay of

Villefranche-sur-mer. The last day was programmed for the DYFAMED cruise, however a CTD cast was performed with water sampling for CDOM and HPLC analysis for the BOUSSOLE program.

## Saturday 14 June 2014

The sea state was smooth with a light breeze. The sky was cloudy and hazy and the visibility was medium. When arrived at BOUSSOLE divers went at sea to clean the buoy sensors, to take pictures and to perform dark measurements of the backscattering meter and transmissometers. At the top of the buoy, the above-surface irradiance and PAR sensors were cleaned, as well as the connectors of the ARGOS beacon, solar panels, and CISCO antenna. Buoy data were retrieved via cable connection to the buoy computer. Then, 1 Secchi disk, 1 CTD cast with water sampling and 3 C-OPS profiles were performed at the BOUSSOLE site. Finally, the CTD transect was partially completed: CTD casts were performed at 3 stations (stations 02, 03 and 05).

## Sunday 15 June 2014

Bad weather prevented departure from the Nice harbour.

## Monday 16 June 2014

The third day, bad weather prevented working at the BOUSSOLE site. This day was used to perform optical profiles tests in the bay of Villefranche-sur-mer.

## Thursday 17 June 2014

This day was programmed for the DYFAMED cruise. Unfortunately, CDOM could not be sampled during the BOUSSOLE cruise. Therefore water samples were collected with the CTD cast at DYFAMED site for CDOM and HPLC analysis for the BOUSSOLE program.

Pictures taken during this cruise can be found at:

<https://plus.google.com/photos/114686870380724925974/albums/6026666408510689281?banner=pwa>

Data from the BOUSSOLE cruises and buoy are available at:

[http://www.obs-vlfr.fr/Boussole/html/boussole\\_data/login\\_form.php](http://www.obs-vlfr.fr/Boussole/html/boussole_data/login_form.php)

## Cruise Report

### Saturday 14 June 2014 (UTC)

People on board: Jean De Vaugelas, Melek Golbol, Stéphane Jamme, Yves Lamblard, Vincent Taillandier and Mehmet Yayla.

0600 Departure from the Nice harbour.  
0930 Arrival at the BOUSSOLE site.  
0940 Diving on the buoy for cleaning sensors, performing dark measurements, taking pictures.  
0945 Cleaning of the solar panels, ARGOS and CISCO connectors, sensors on the top of the buoy.  
1000 Direct connection with the buoy and data retrieval.  
1050 Secchi disk 01 (14m).  
1120 CTD 01, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC,  $a_p$ , and TA/TC.  
1245 C-OPS 01, 02, 03.  
1340 Bucket at surface for TSM.  
Departure to the second transect station.  
1455 CTD 02, 400m, station 02 (43°28'N 07°42'E).  
1525 Departure to the third transect station.  
1555 CTD 03, 400m, station 03 (43°31'N 07°37'E).  
1625 Departure to the fifth transect station.  
1735 CTD 04, 400 m, station 05 (43°37'N 07°25'E).

1800 Departure from the station 05.  
1850 Arrival at the Nice harbour.

## Sunday 15 June 2014

Bad weather prevented departure from the Nice harbour.

## Monday 16 June 2014 (UTC)

People on board: Melek Golbol and Mehmet Yayla.

0800 Departure from the Nice harbour.  
0820 Arrival in the bay of Villefranche-sur-mer.  
0900 C-OPS tests.  
1100 Lunch.  
1300 C-OPS tests.  
1345 Departure to the Nice harbour.  
1405 Arrival at Nice harbour.

## Tuesday 17 June 2014 (UTC)

People on board: Emilie Diamond, Sabine Marty and Lucie Millet.

0525 Departure from the Nice Harbour.  
0835 Arrival at the DYFAMED site.  
0850 CTD 05, DYFAMED site, 2370m with water sampling at 400, 200, 150, 110, 80, 48, 30, 10 and 5m for HPLC and CDOM.  
1110 Following operations for DYFAMED program and for the laboratory.  
1920 Arrival at the Nice harbour.

## Problems identified during the cruise

- Data from the pCO<sub>2</sub> sensor could not be downloaded because the driver of the USB-to-RS232 converter was not installed on the computer that was taken onboard. This operation was postponed for the next mission.
- Only half of the CTD transect was performed (Stations 2, 3 and 5) due to a lack of time.

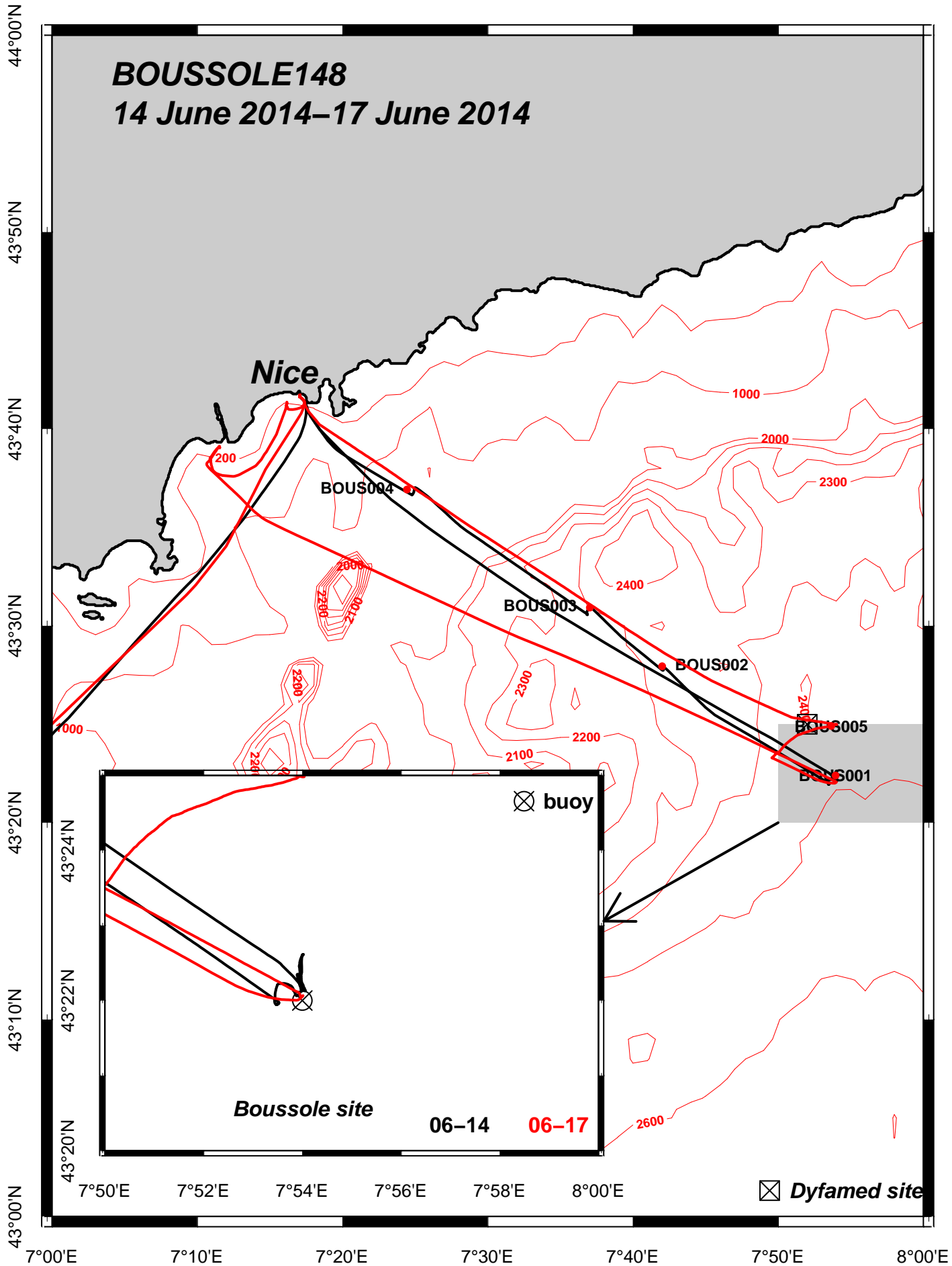
# **Appendices**





# BOUSSOLE148

14 June 2014–17 June 2014

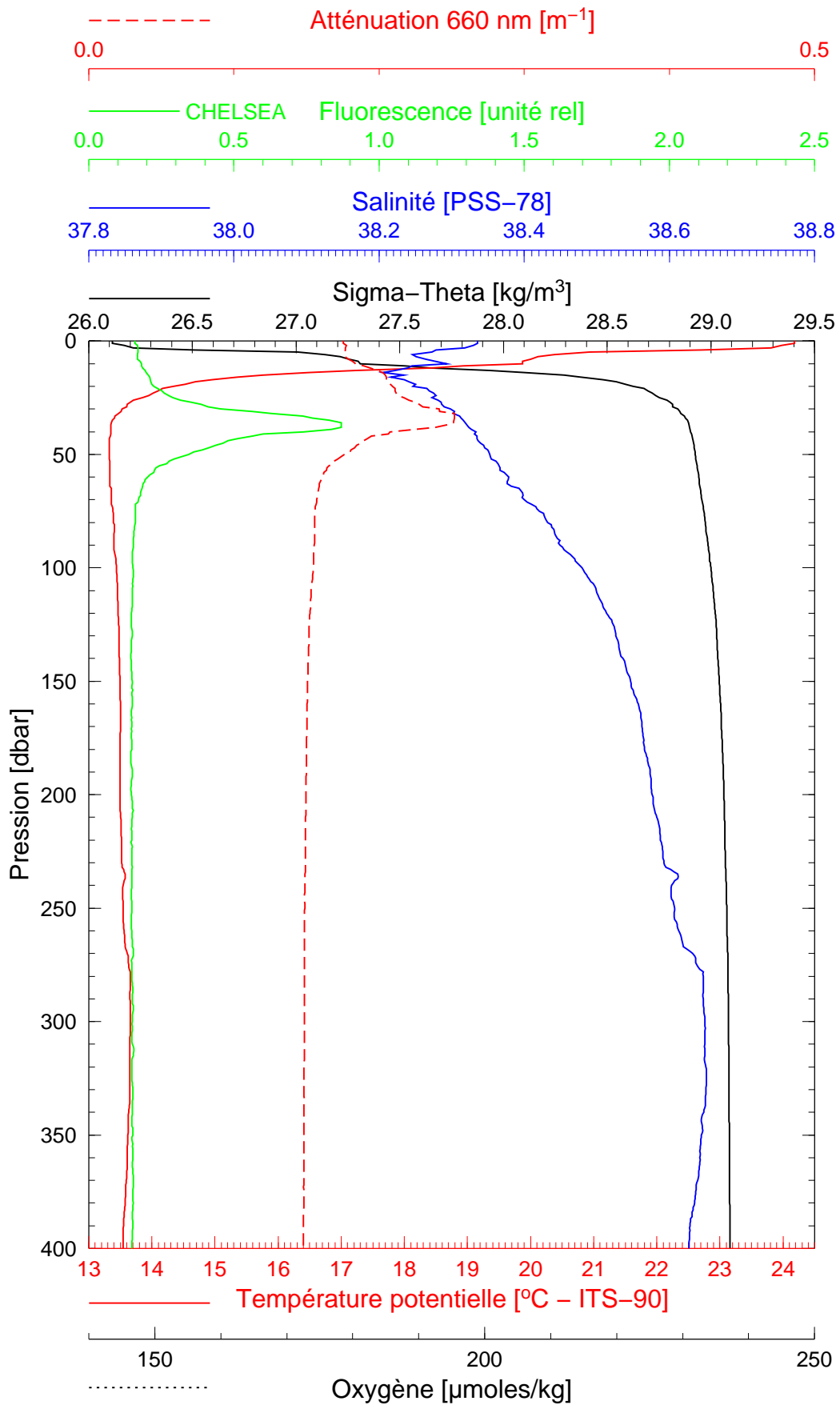


BOUSSOLE 148

14/06/2014

BOUS140614\_01

BOUS001



Date 14/06/2014

Latitude 43°22.396 N

Heure déb 11h 20min [TU]

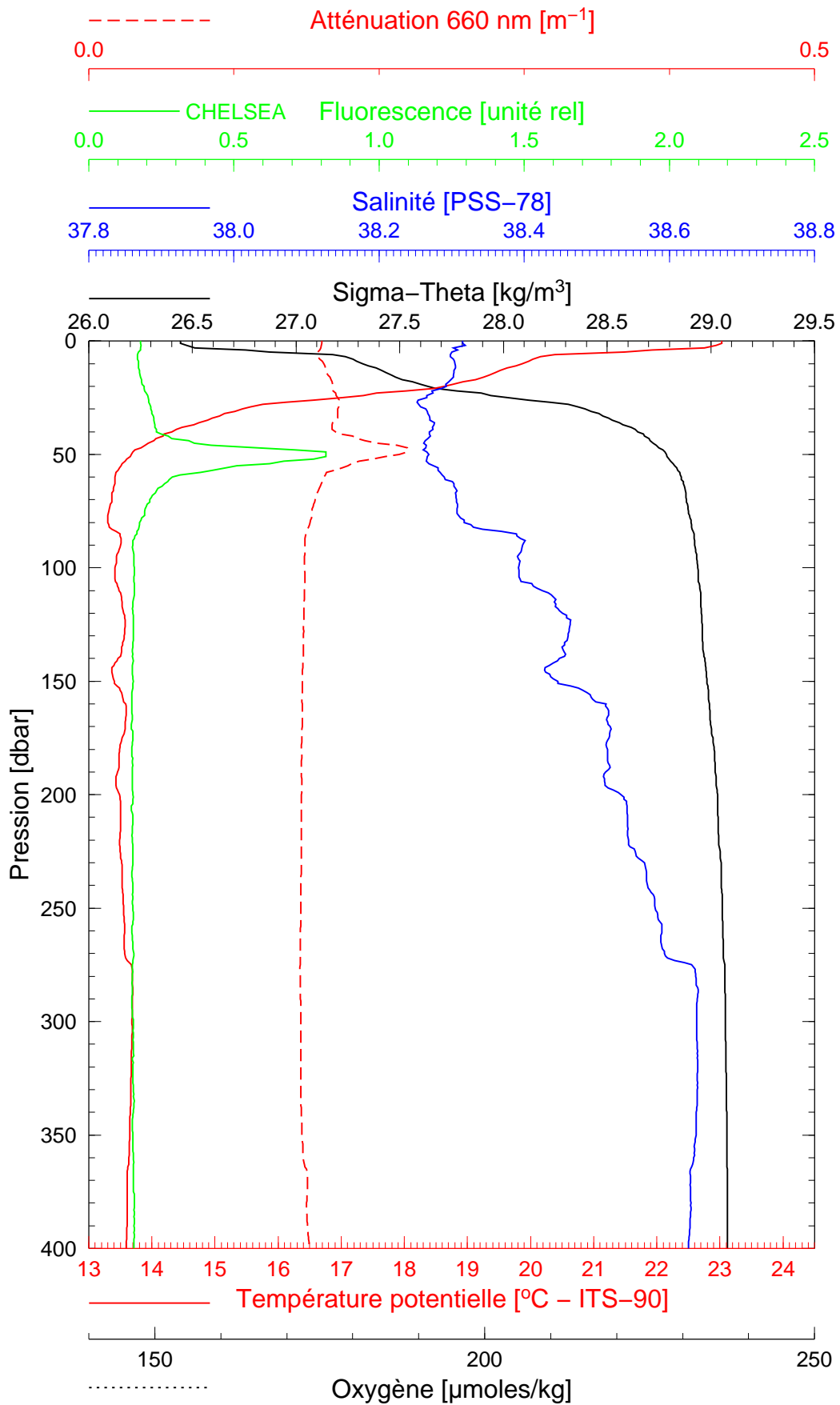
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BOUSSOLE 148

14/06/2014

BOUS140614\_02

BOUS002



Date 14/06/2014  
Heure déb 14h 54min [TU]

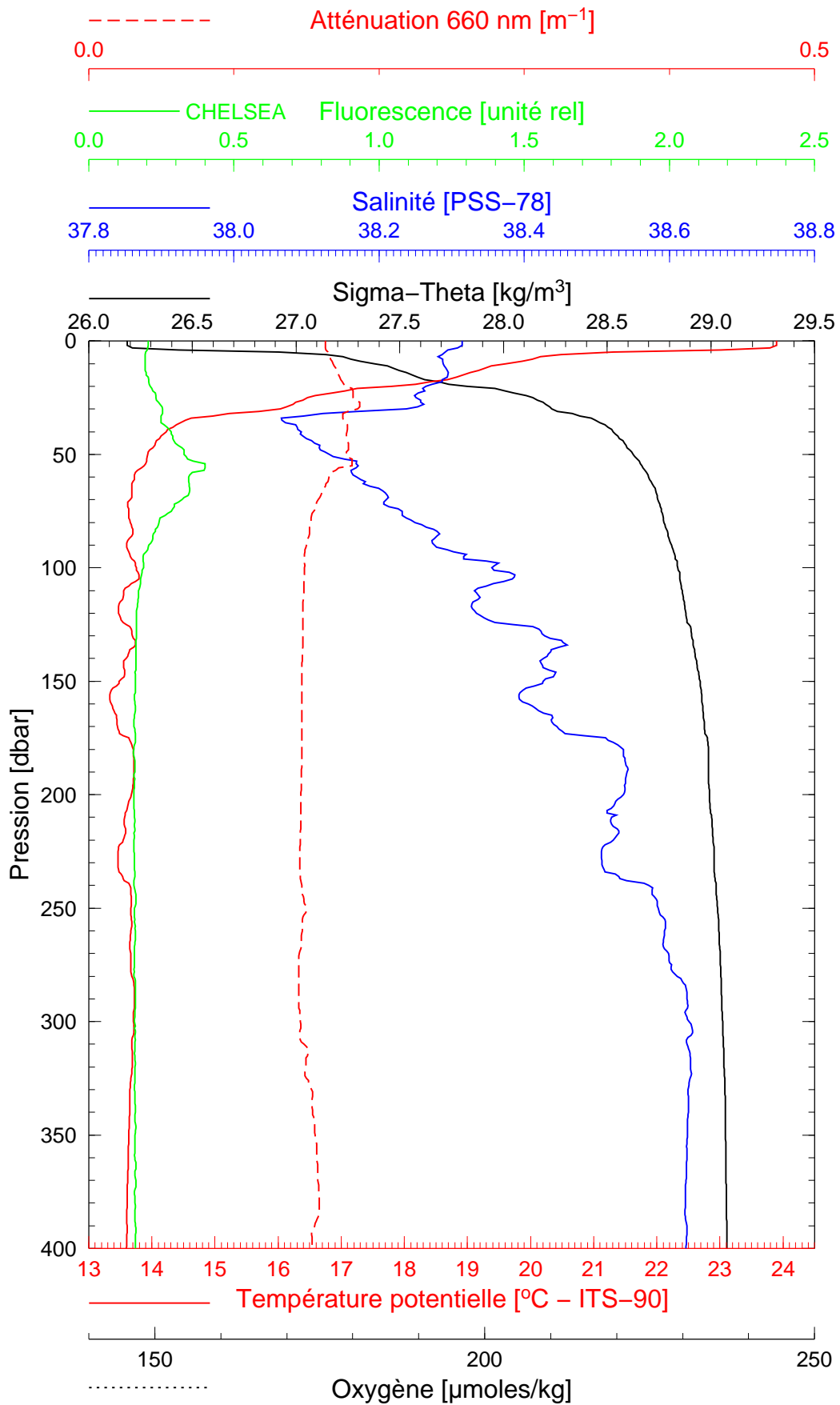
Latitude 43°27.947 N  
Longitude 07°42.013 E

BOUSSOLE 148

14/06/2014

BOUS140614\_03

BOUS003



Date 14/06/2014

Latitude 43°30.927 N

Heure déb 15h 57min [TU]

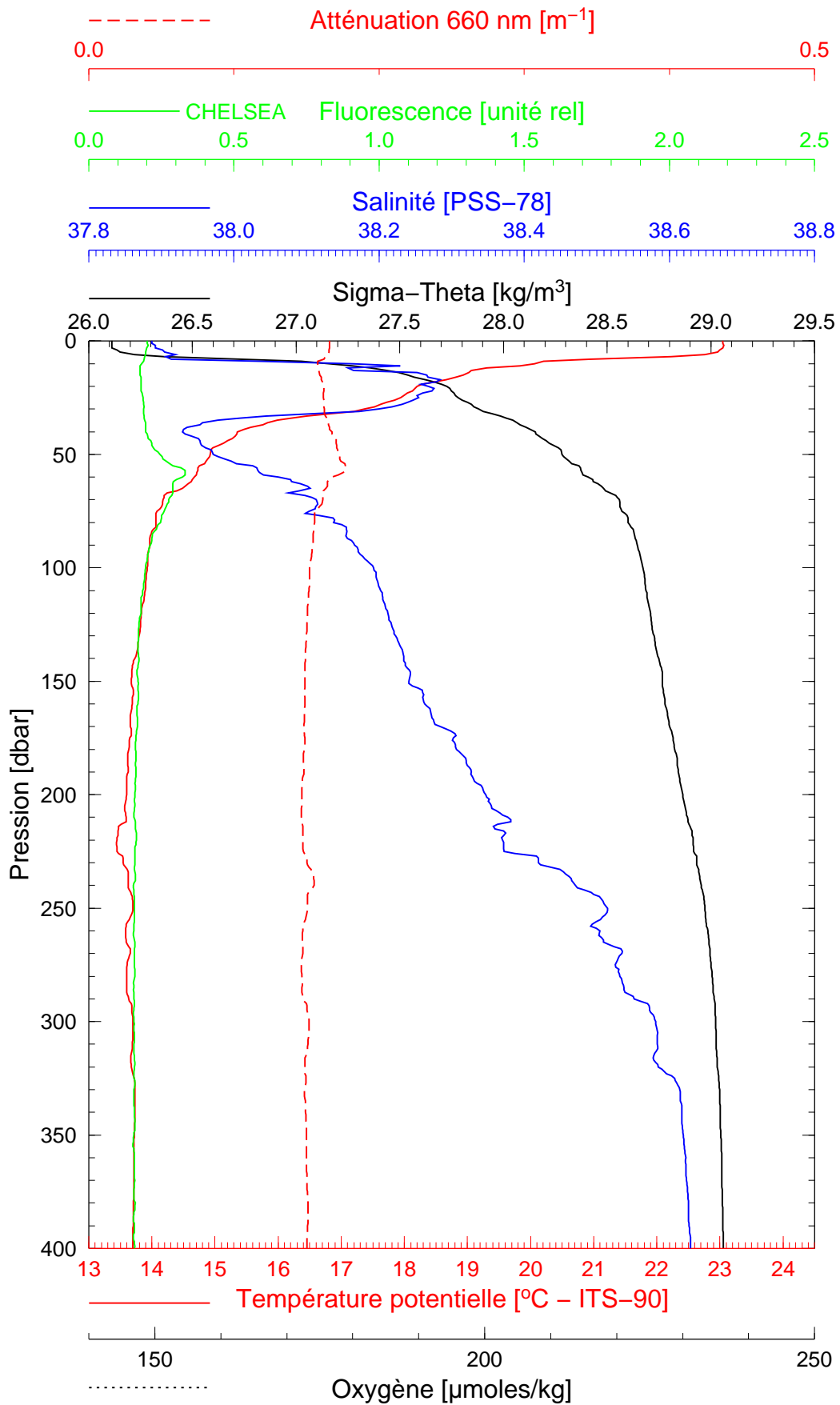
Longitude 07°37.036 E

BOUSSOLE 148

14/06/2014

BOUS140614\_04

BOUS004



Date 14/06/2014

Latitude 43°36.923 N

Heure déb 17h 34min [TU]

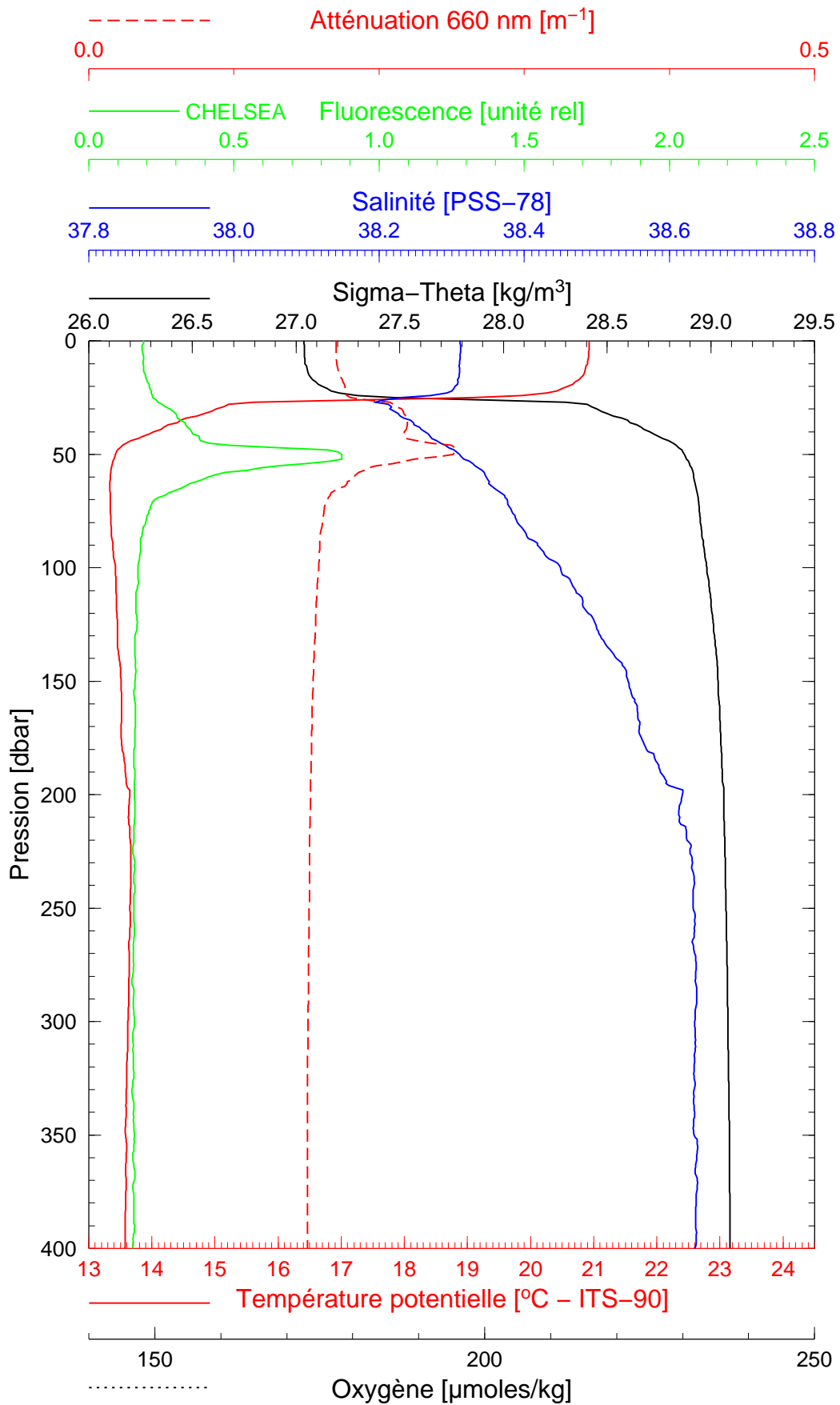
Longitude 07°24.442 E

BOUSSOLE 148

17/06/2014

BOUS140617\_01

BOUS005



Date 17/06/2014  
Heure déb 08h 49min [TU]

Latitude 43°24.913 N  
Longitude 07°53.656 E