

The BOUSSOLE project technical reports; report # 10-138, issue 1.

BOUSSOLE Monthly Cruise Report

Cruise 155

January 19-20 & 22-23, 2015

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

Vessel: R/V L'Europe
(Captain: Franck Lofficial)

Science Personnel: Guillaume De Liège, Melek Golbol, Thomas Lucas, David Luquet, Didier Robin, Vincent Taillandier and Vincenzo Vellucci.

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



The first BOUSSOLE cruise of year 2015 was carried out with the R/V L'EUROPE.

BOUSSOLE project

ESA/ESRIN contract N° 4000111801/14/I-NB

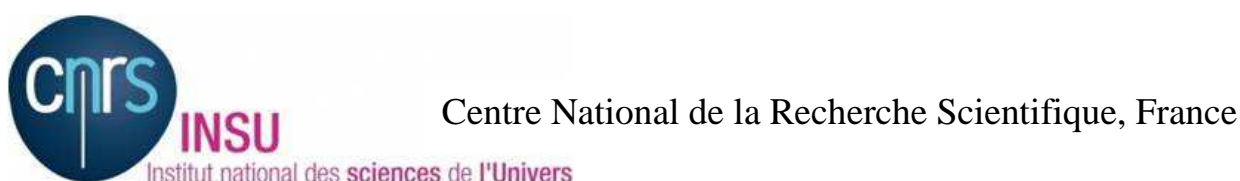
February 24, 2015



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



Observatoire Océanologique de Villefranche/mer, France

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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. 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 dissolved oxygen (DO), total alkalinity (TA) and total inorganic carbon (TC) 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 TA/TC 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 pCO₂ 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

Additional operations

The last day of this cruise, divers installed the pCO₂ CARIOCA sensor at 10m which could not be installed during the last cruise.

Cruise Summary

The first day was used to download data and to clean ARGOS and CISCO connectors on the top of the buoy, to perform a CTD cast with water sampling, a Secchi disk, and the CTD transect. The second day was used to perform a Secchi disk and a CTD cast with water sampling. The bad weather did not allowed us to perform other operations. The third day, bad weather prevented departure from the Nice harbour. The last day was used for diving operations, a Secchi disk, optical profiles and water sampling.

Monday 19 January 2015

The sea state was slight with a moderate breeze. The sky was overcast with a medium visibility. When arrived at the BOUSSOLE site, the dinghy was prepared and a direct connection with the buoy was attempted for retrieving data: data were retrieved successfully. The ARGOS and CISCO connectors and solar panels on the top of the buoy were cleaned. 1 CTD cast with water sampling and a Secchi disk were performed at the BOUSSOLE site. C-OPS profiles could not be performed because of the bad conditions: too many clouds and unstable sky. Then the CTD transect was performed.

Tuesday 20 January 2015

The sea state was moderate with a fresh breeze. The sky was overcast with a medium visibility. 1 CTD cast with water sampling and a Secchi disk were performed at the BOUSSOLE site. Because of the bad weather, we could not performed the C-OPS profiles. Then we decided to return to the Nice harbour.

Thursday 22 January 2015

Bad weather prevented departure from the Nice harbour.

Friday 23 January 2015

The sea state was slight with a gentle breeze. When arrived at the BOUSSOLE site, divers went at sea to clean the buoy sensors, take pictures and perform dark measurements of the backscattering meter and transmissometers. They also installed the pCO₂ CARIOCA sensor at 10m. Then a Secchi disk and 2 C-OPS profiles were performed at the BOUSSOLE site. Because of the bad weather, we could not perform the CTD cast. A water sampling at 5m with a Niskin bottle was performed at BOUSSOLE before returning to the Nice harbour.

Pictures taken during this cruise can be found at:

<https://plus.google.com/photos/114686870380724925974/albums/6117478439314061393?banner=pwa>

Data from the BOUSSOLE cruises and buoy are available at:

http://www.obs-vlfr.fr/Boussole/html/boussole_data/login_form.php

Cruise Report

Monday 19 January 2015 (UTC)

People on board: Melek Golbol, Thomas Lucas and Vincent Taillandier.

0810 Departure from the Nice harbour.
1140 Arrival at the BOUSSOLE site.
1200 Direct connection with the buoy and data retrieval.
1245 Cleaning of the sensors and solar panels on the top of the buoy.
1320 CTD 01, 400m with water sampling at 400, 200, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p, TSM, CDOM, TA/TC and DO.
1355 Secchi 01, 14m.
1400 Departure to the first transect station.
1455 CTD 02, 400m, station 01 (43°25'N 07°48'E).
1555 CTD 03, 400m, station 02 (43°28'N 07°42'E).
1655 CTD 04, 400m, station 03 (43°31'N 07°37'E).
1745 CTD 05, 400m, station 04 (43°34'N 07°31'E).
1845 CTD 06, 400 m, station 05 (43°37'N 07°25'E).
1935 CTD 07, 400 m, station 06 (43°39'N 07°21'E).
2000 Departure to the Nice harbour.
2030 Arrival at the Nice harbour.

Tuesday 20 January 2015 (UTC)

People on board: Melek Golbol and Vincent Taillandier.

0710 Departure from the Nice harbour.
1015 Arrival at the BOUSSOLE site.
1030 Secchi 02, 12m.
1045 CTD 08, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC and a_p .
1135 Departure to the Nice harbour.
1500 Arrival at the Nice harbour.

Thursday 22 January 2015

Bad weather prevented departure from the Nice harbour.

Friday 23 January 2015 (UTC)

People on board: Guillaume De Liège, Melek Golbol, David Luquet, Didier Robin and Vincenzo Vellucci.

0630 Departure from the Nice harbour.
1015 Arrival at the BOUSSOLE site.
1050 Diving on the BOUSSOLE buoy for cleaning sensors, performing dark measurements, taking pictures and installation of the pCO₂ CAROCIA sensor at 10m.
1130 Secchi 03, 16m.
1250 C-OPS 01, 02.
1400 Water sampling with Niskin bottle at 5m for HPLC, a_p and TSM.
1420 Departure to the Nice harbour.
1740 Arrival at the Nice harbour.

Problems identified during the cruise

- The IOP package was not available because the instruments were sent to *Hobi Instruments service* for calibrations. The instruments were not returned in time for this cruise.
- The C-OPS commonly used on the BOUSSOLE missions was under calibration at *Biospherical*. The C-OPS used for this cruise was the one shared among the marine optics and remote sensing group at LOV. The instrument is similar to the BOUSSOLE one, yet has a Lu sensor instead of a Eu one.
- The CTD 02 cast was started at 10m depth because of the bad weather conditions (choppy sea).
- The filtration station did not work correctly: the filtrations of HPLC samples from CTD 01 and CTD 02 took a long time (2 hours for some samples). This problem was solved with repointing the seal joint of the tube on the filtration station.

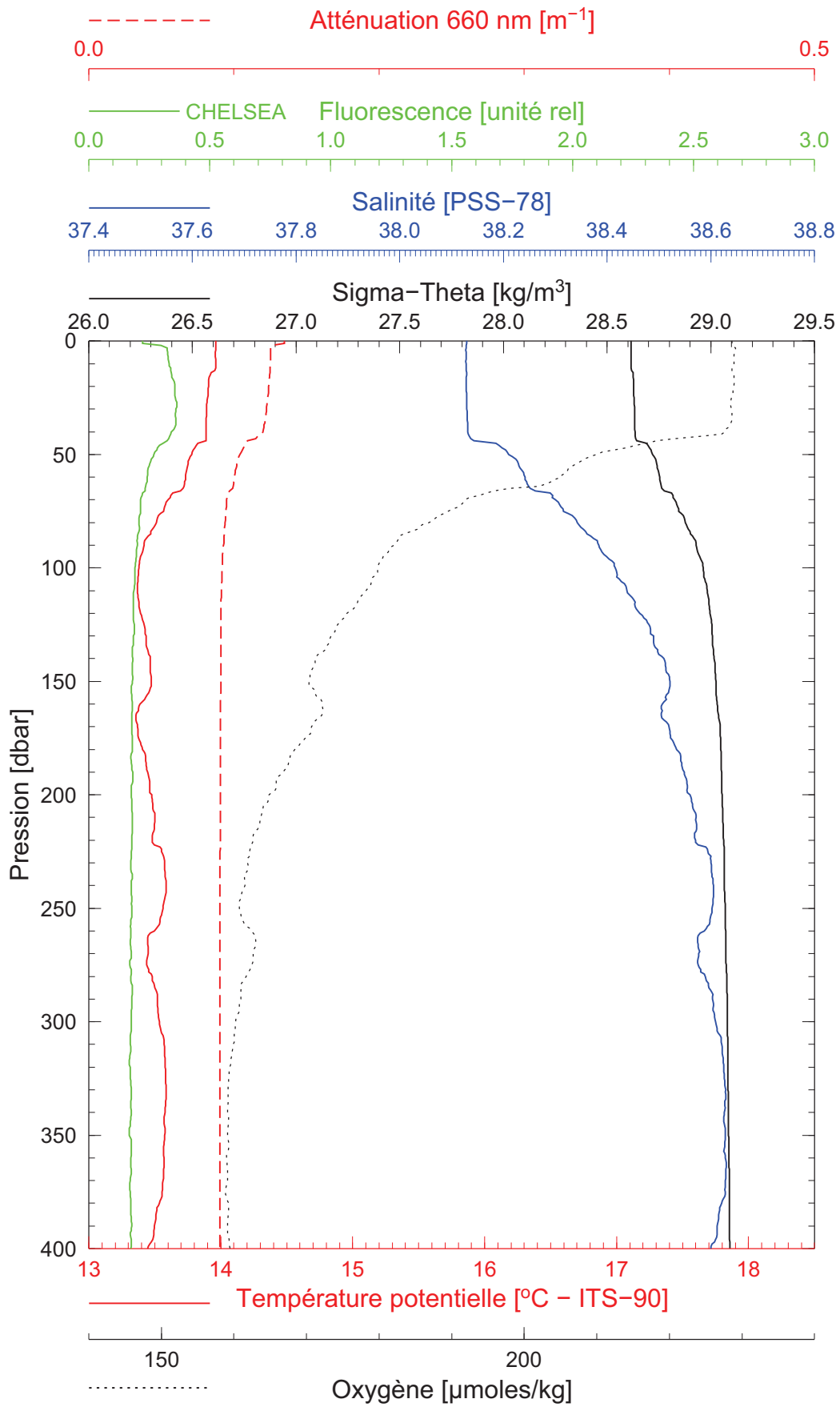
Appendices

BOUSSOLE 155

19/01/2015

BOUS150119_01

BOUS001



Date 19/01/2015
Heure déb 13h 21min [TU]

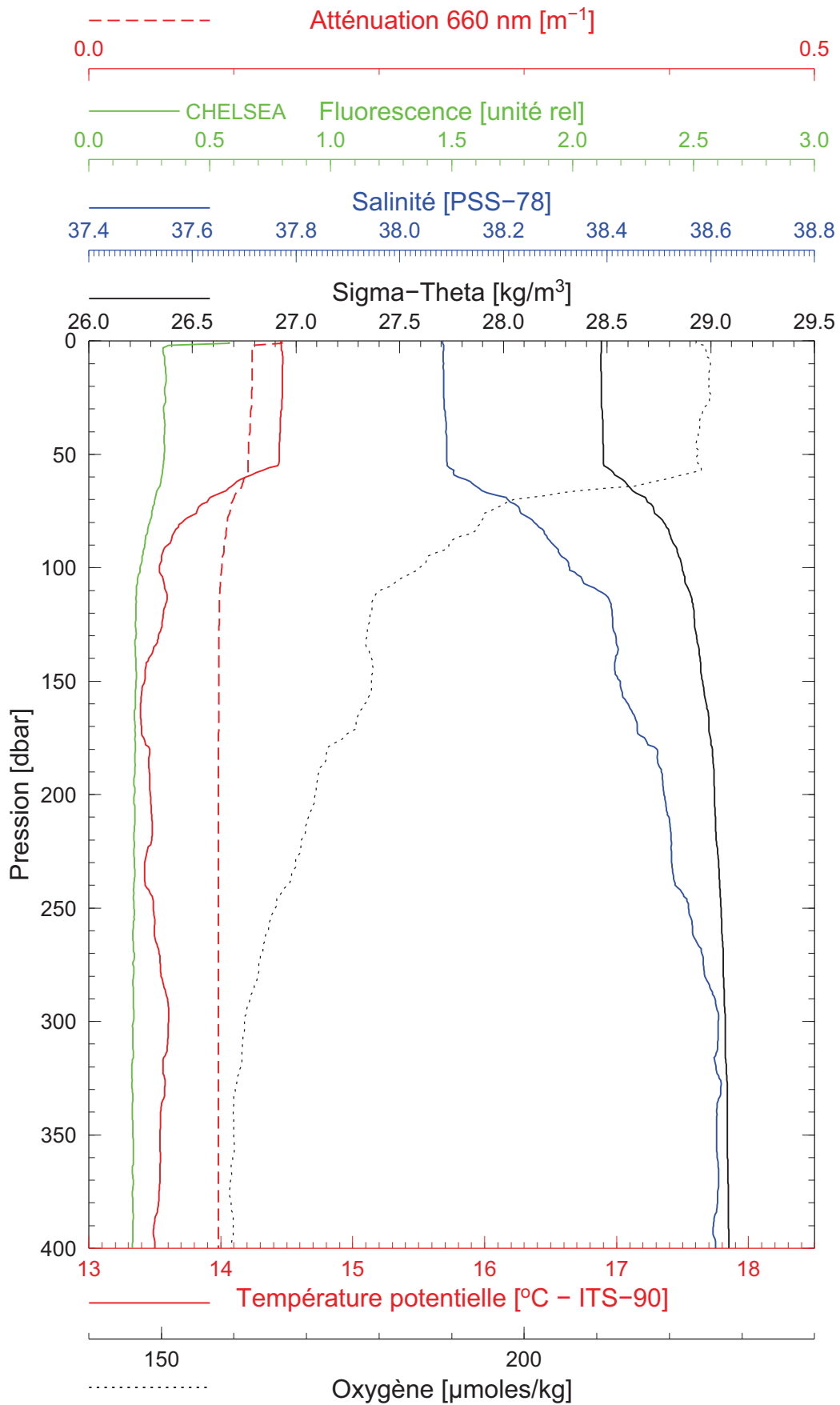
Latitude 43°22.014 N
Longitude 07°53.784 E

BOUSSOLE 155

19/01/2015

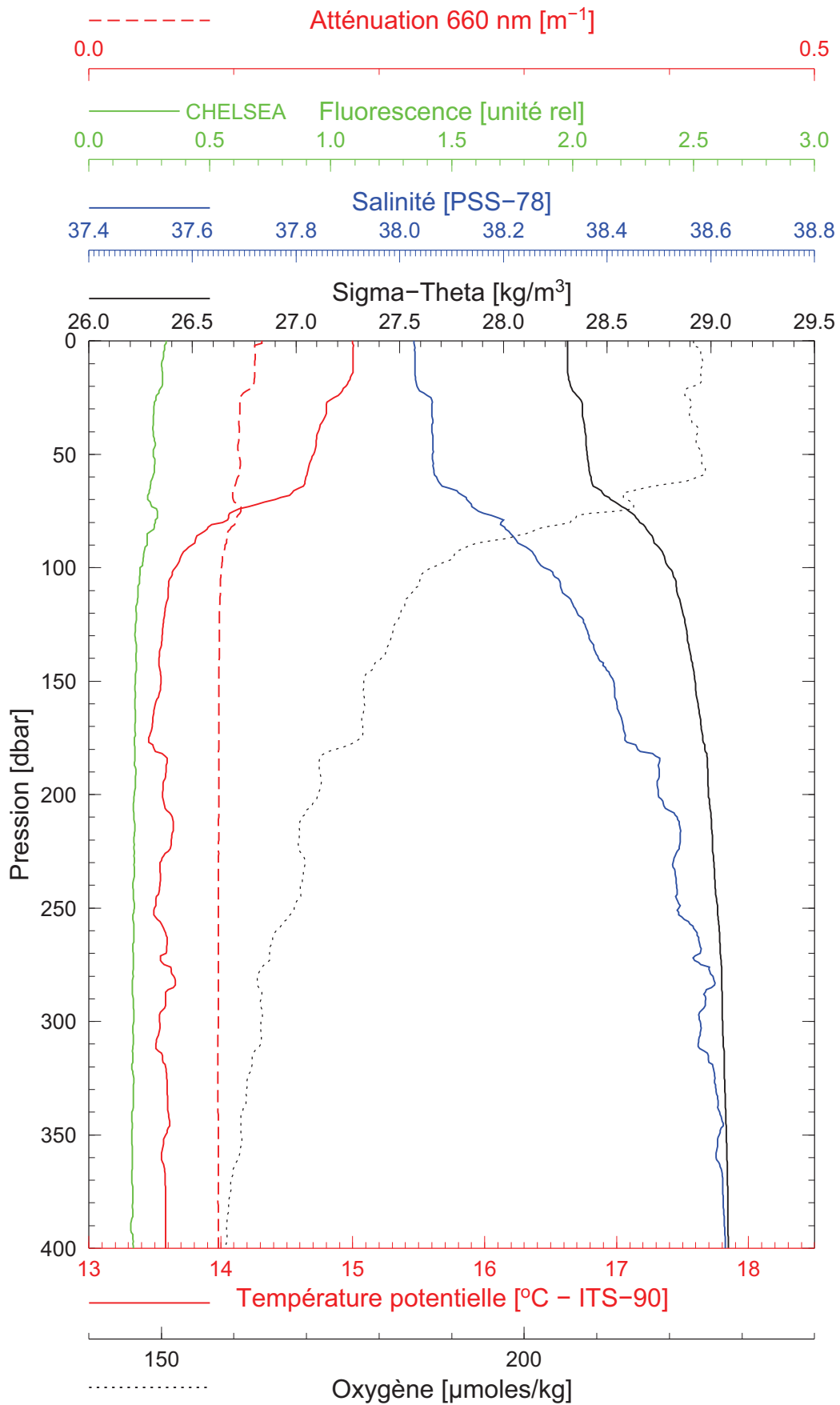
BOUS150119_02

BOUS002



Date 19/01/2015
Heure déb 14h 54min [TU]

Latitude 43°25.099 N
Longitude 07°47.895 E



Date 19/01/2015
Heure déb 15h 52min [TU]

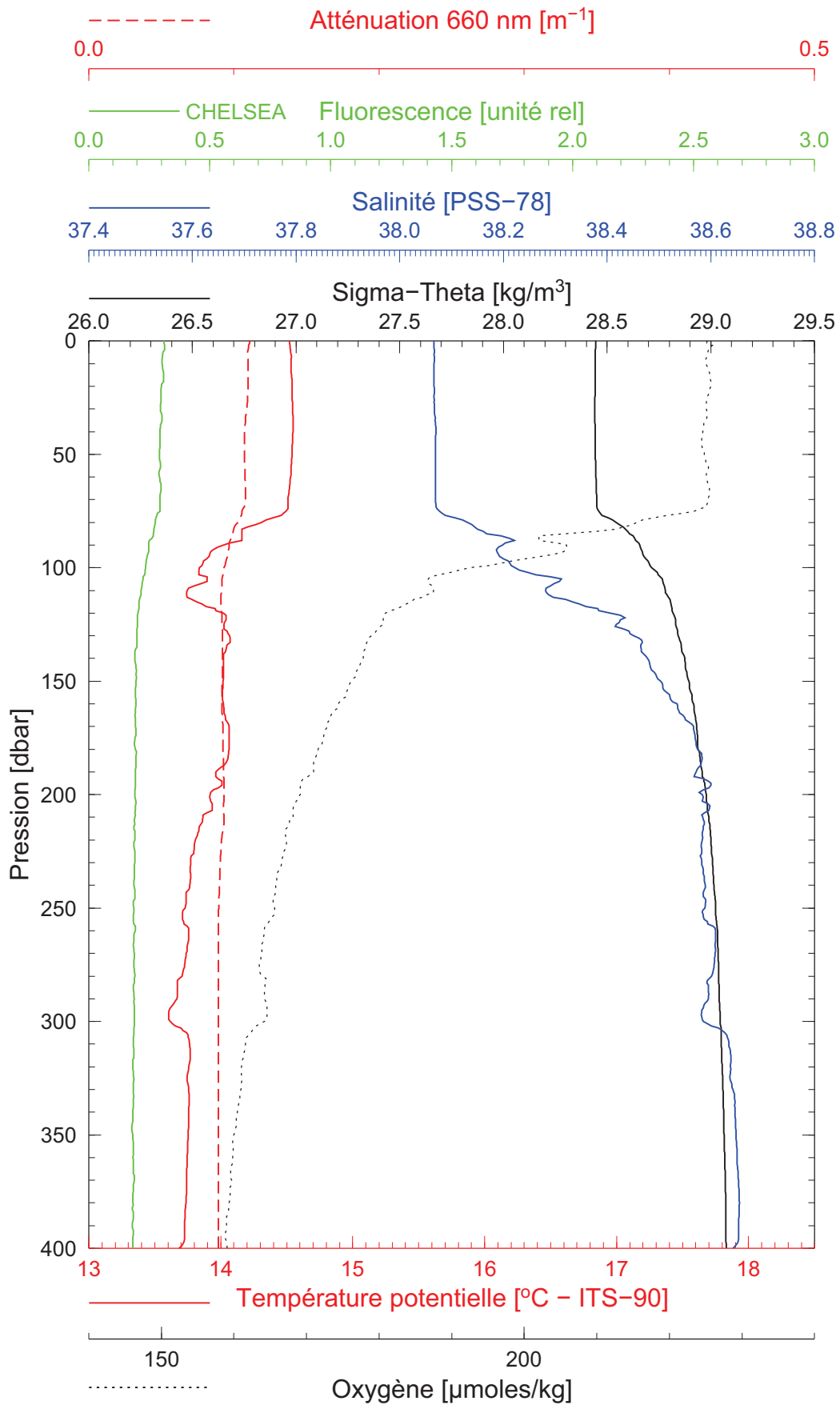
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BOUSSOLE 155

19/01/2015

BOUS150119_04

BOUS004

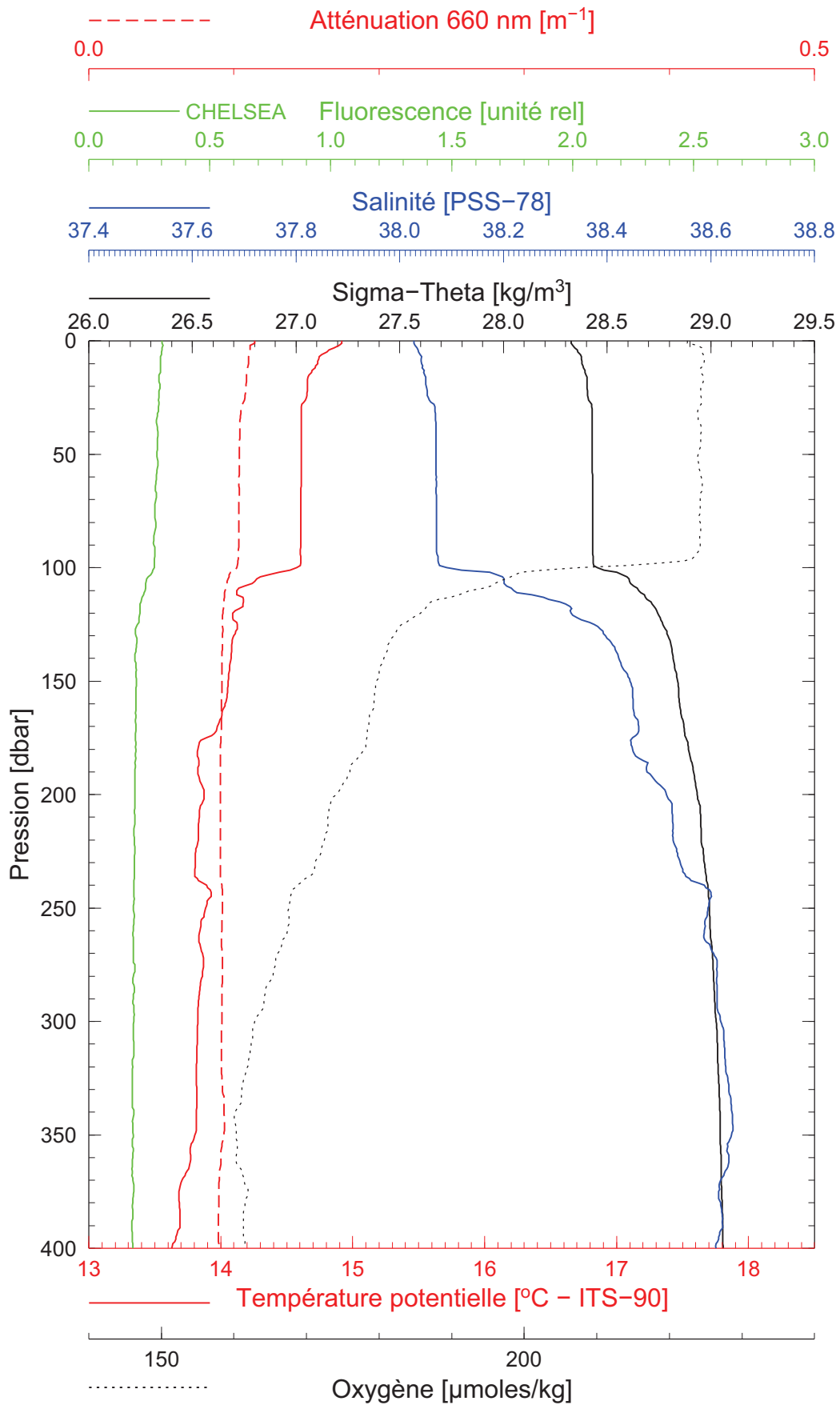


Date 19/01/2015

Latitude 43°31.013 N

Heure déb 16h 45min [TU]

Longitude 07°36.964 E



Date 19/01/2015

Latitude 43°33.988 N

Heure déb 17h 45min [TU]

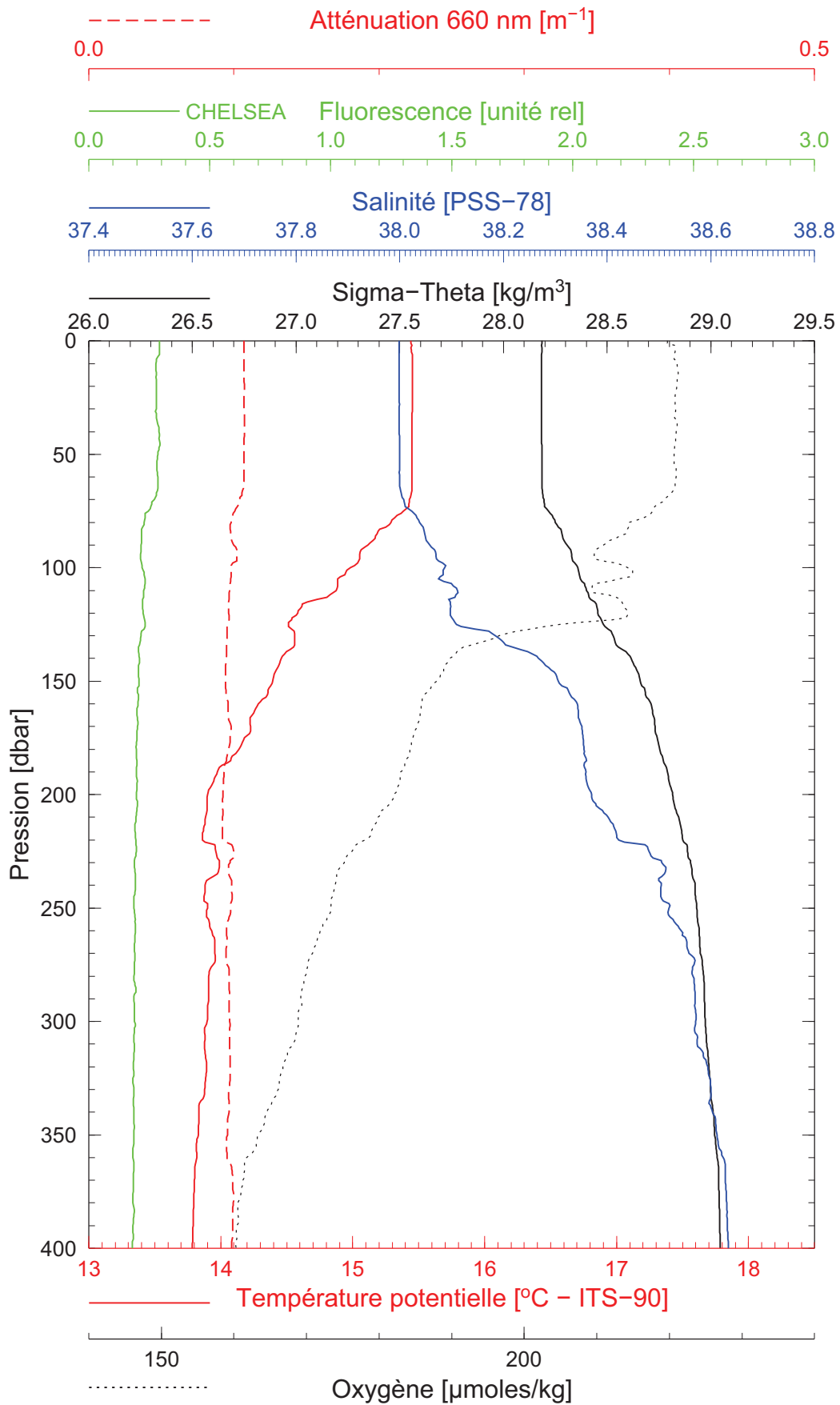
Longitude 07°30.908 E

BOUSOLE 155

19/01/2015

BOUS150119_06

BOUS006



Date 19/01/2015

Latitude 43°36.992 N

Heure déb 18h 44min [TU]

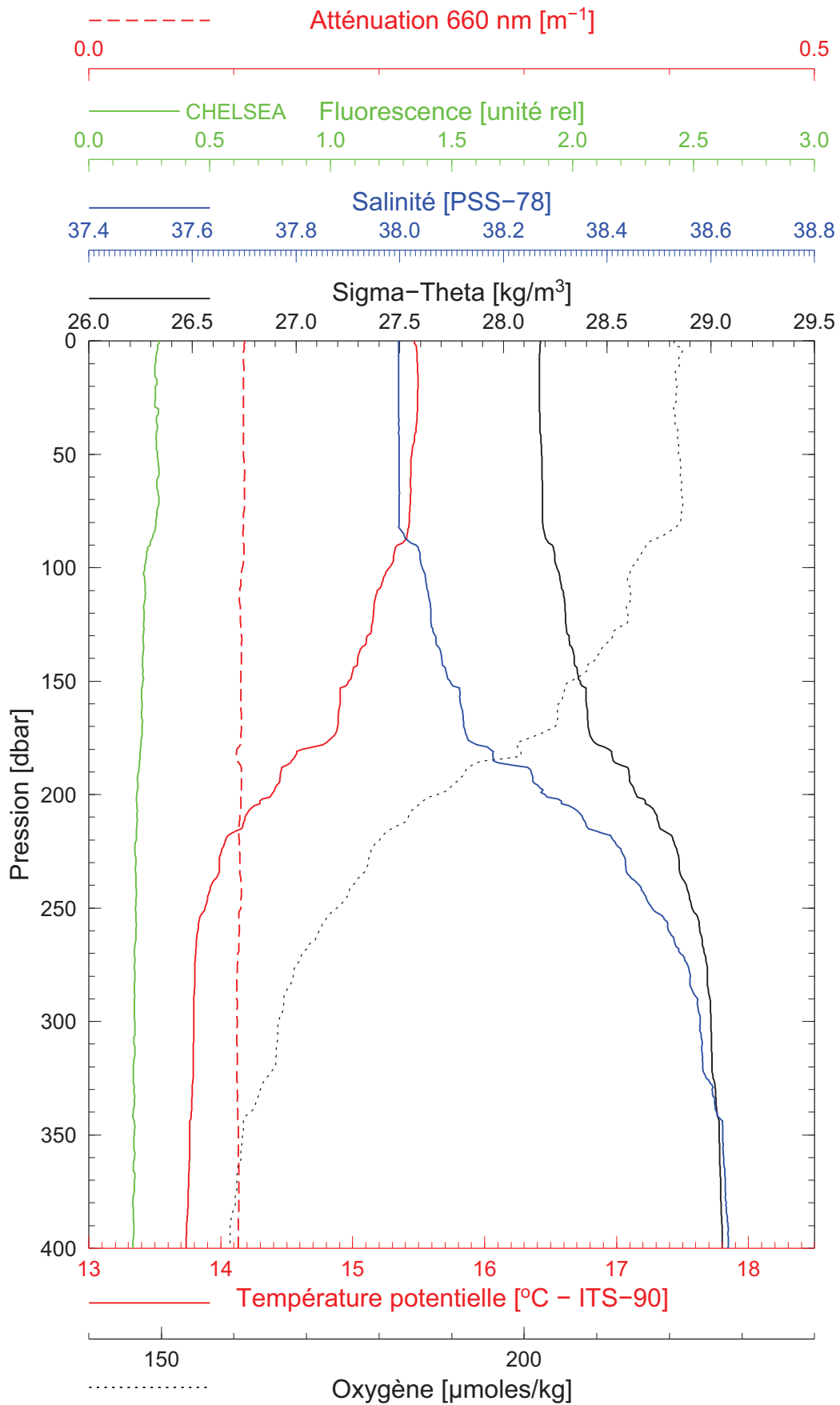
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BOUSSOLE 155

19/01/2015

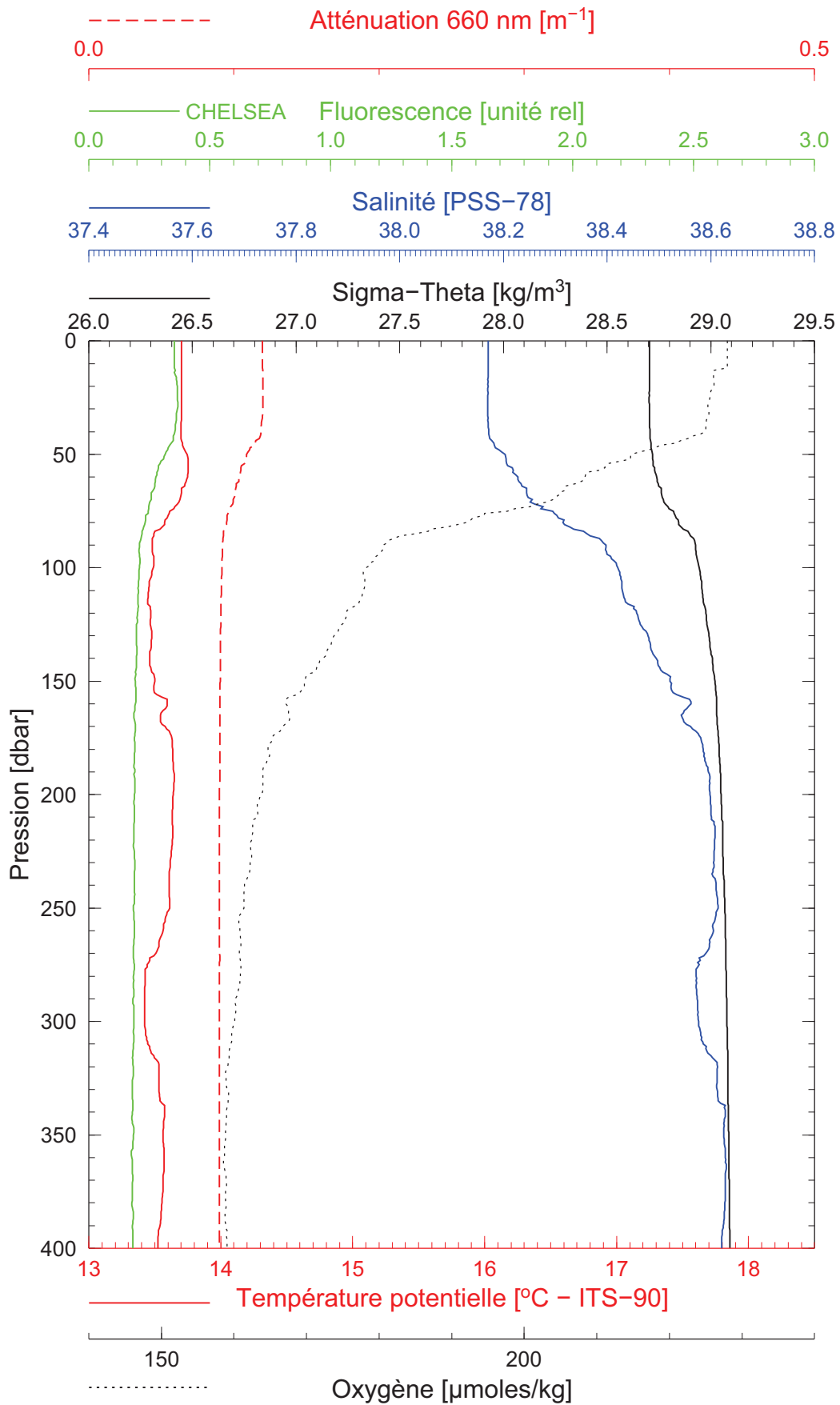
BOUS150119_07

BOUS007



Date 19/01/2015
Heure déb 19h 35min [TU]

Latitude 43°38.994 N
Longitude 07°20.938 E



Date 20/01/2015
Heure déb 10h 40min [TU]

Latitude 43°21.994 N
Longitude 07°53.783 E