

BOUSSOLE Monthly Cruise Report

Cruise 123

May 15 - 18, 2012

Duty Chief: Emilie Diamond (diamond@obs-vlfr.fr)

Vessel: R/V Europe
(Captain: Gilles Le Cléach)

Science Personnel: Emilie Diamond, David Luquet, Grigor Obolensky, Laurie Perrot, Vincenzo Vellucci and Petr (diver).

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The 1000th CTD cast of the BOUSSOLE project was performed on the 17th May 2012 during the CTD transect.

BOUSSOLE project

ESA/ESRIN contract N° 13226/10/I-NB

May 31, 2012



Foreword

This report is part of the technical report series that is being established by the BOUSSOLE project.

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European Space Agency



Centre National d'Études Spatiales, France

CENTRE NATIONAL D'ÉTUDES SPATIALES



National Aeronautics and Space Administration, USA



Centre National de la Recherche Scientifique, France



Université Pierre & Marie Curie, France



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 to occur on 0-150 m at the BOUSSOLE site within about 3 hours of satellite overhead passes (of MERIS in particular) 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. In addition to the depth profile from the CTD, CDOM fluorometer, Chl fluorometer, AC9 (from July 2002) and Eco-BB3 (from June 2003), seawater samples are to be collected, filtered and stored into liquid nitrogen for 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. From December 2011, hyperspectral absorption measurements are to be performed during the CTD deployments using a new "IOP package" including a Hobilabs hyperspectral absorption-meter (a-sphere), a backscattering meter (Hydroscat-6) and a spectral transmissometer (Gamma-4).

For one day of each cruise, in addition to a depth profile from the CTD, seawater samples are to be collected and filtered for colored dissolved organic matter (from June 2005) and particulate organic carbon (from October 2011) analysis in the lab. Small quantities of seawater are to be fixed with glutaraldehyde for cytometric analysis (from December 2011).

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 (see map in appendix). The time of the day of this transect should be similar for each cruise, if possible to minimise the 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 surfaces, and then take again some pictures after cleaning. Divers will also put a neoprene cap on the HS4 and on the transmissometers for acquiring three dark measurements (started in April 2009).

Further details about these operations and the 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 buoy ARGOS connector was cleaned the first cruise day because the beacon stopped its data transmission from the 19th April 2012. One of the buoy solar panels was broken so it was replaced. During the diving day, the radiometers copper ribbons against biofouling were changed. Some changes on the buoy configuration were also made. During this cruise, a remA sensor (including a Satlantic OCR-4 and a WET Labs Eco-3) was installed on the BOUSSOLE rosette and was connected to the Wet Labs DH-4 data logger to test it during the CTD casts. The 1000th BOUSSOLE CTD profile was performed during this transect.

Cruise Summary

Three of the four cruise days were used due to the bad weather on the second day. The first cruise day was used for the buoy maintenance and diving operations and for C-OPS balance tests. The two last days were used for optical profiles and CTD casts with water sampling at the BOUSSOLE site. The third day was also used for performing the CTD transect and the last day for other buoy maintenance operations.

Tuesday 15 May 2012

The first day, the sea was slight with a light breeze and the sky was blue with a good visibility. When arrived at the BOUSSOLE site, divers went at sea to clean buoy instruments (which were quite dirty) and a part of the buoy structure. The radiometers were also taken off and brought on the dinghy to change their copper ribbon against biofouling before being put back. In parallel to diving operations, a damaged solar panel was taken off. A direct connection with the buoy was also established for data retrieval and other solar panels, sensors and ARGOS and CISCO connectors on the top of the buoy were cleaned. Then 1 C-OPS profile was performed.

Wednesday 16 May 2012

Bad weather prevented departure from the Nice harbour.

Thursday 17 May 2012

The third day, the sea was slight with a gentle breeze and the sky was blue the morning and cloudy the afternoon. When arrived at the BOUSSOLE site, 2 CTD casts with water sampling, 1 Secchi disk and 3 C-OPS profiles were performed. Then the CTD transect was performed.

Friday 18 May 2012

The last day, the sea was slight with a light breeze. The sky was overcast and rainy. When arrived at the BOUSSOLE site, a direct connection with the buoy was established for data retrieval and for changing the buoy schedule configuration. The missing solar panel was also changed. Then 3 C-OPS profiles, 1 CTD cast with water sampling and 1 Secchi disk were performed.

Cruise Report

Tuesday 15 May 2012 (UTC)

People on board: Emilie Diamond, Grigor Obolensky, Laurie Perrot, Vincenzo Vellucci and 2 divers.

- 0550 Departure from the Nice harbour.
- 0920 Arrival at the BOUSSOLE site.
- 0940 Diving on the buoy for cleaning instruments and the buoy structure. Change of the radiometers copper ribbon against biofouling.
- 0950 Cleaning of solar panels, sensors and ARGOS and CISCO connectors on the head of the buoy. The broken solar panel was taken off.
- 1200 Direct connection with the buoy and data retrieval.
- 1210 Lunch.
- 1300 CISCO connection with the buoy and data retrieval: buoy OK.
- 1305 C-OPS balance tests.
- 1345 C-OPS 01.
- 1410 Departure to the Nice harbour.
- 1740 Arrival at the Nice harbour.

Wednesday 16 May 2012

Bad weather prevented departure from the Nice harbour.

Thursday 17 May 2012 (UTC)

People on board: Emilie Diamond and Grigor Obolensky.

- 0445 Departure from the Nice harbour.
- 0815 Arrival at the BOUSSOLE site.
- 0845 CTD 01, 400 m with water sampling at 400, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p and TSM.
- 1000 Attempt of CISCO connection: unsuccessful.
- 1015 Secchi disk 01 (21 m).
- 1030 End of filtrations.
- 1050 C-OPS 02, 03, 04.

1220 CTD 02, 400 m with water sampling at 400, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p , TSM, POC, CDOM and cytometry.
1300 Departure to the first transect station.
1340 CTD 03, 400 m, station 01 (43°25'N 07°48'E).
1450 CTD 04, 400 m, station 02 (43°28'N 07°42'E).
1600 CTD 05, 400 m, station 03 (43°31'N 07°37'E).
1705 CTD 06, 400 m, station 04 (43°34'N 07°31'E).
1810 CTD 07, 400 m, station 05 (43°37'N 07°25'E).
1905 CTD 08, 400 m, station 06 (43°39'N 07°21'E).
1930 Departure to the Nice harbour.
2000 Arrival at the Nice harbour.

Friday 18 May 2012 (UTC)

People on board: Emilie Diamond and Grigor Obolensky.

0505 Departure from the Nice harbour.
0830 Arrival at the BOUSSOLE site.
0900 Direct connection with the buoy: data retrieval and change of buoy schedule configuration.
0915 Change of the missing solar panel on the head of the buoy.
1000 Lunch.
1100 C-OPS 05, 06, 07.
1210 CTD 09, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p , and TSM.
1255 Secchi disk 02 (17 m).
1300 Departure to the Nice harbour.
1620 Arrival at the Nice harbour.

Problems identified during the cruise

- The buoy stopped to record data 10 days before the cruise because there was no more space on the memory disk.
- The second day, bad weather prevented the departure from the Nice harbour.
- The AC9 did not work between the CTD 002 and the CTD 004.
- The HS6 did not work well during the CTD 004.

Calculated Swath paths for the MERIS Sensor

After 10 years of service, Envisat has stopped sending data to Earth from the 8th April 2012.

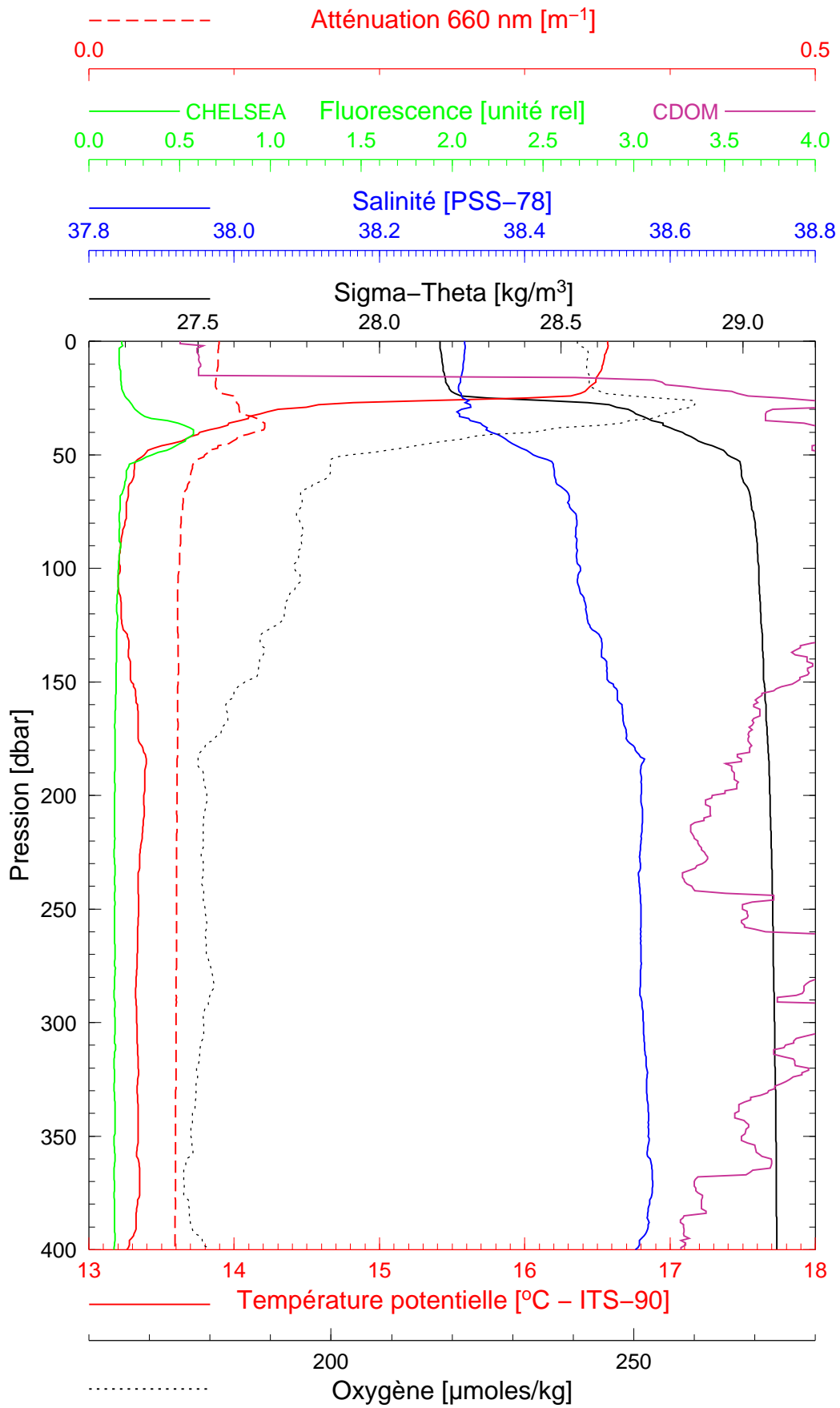
Appendices

BOUSSOLE 123

17/05/2012

BOUS120517_01

BOUS001



Date 17/05/2012
Heure déb 08h 53min [TU]

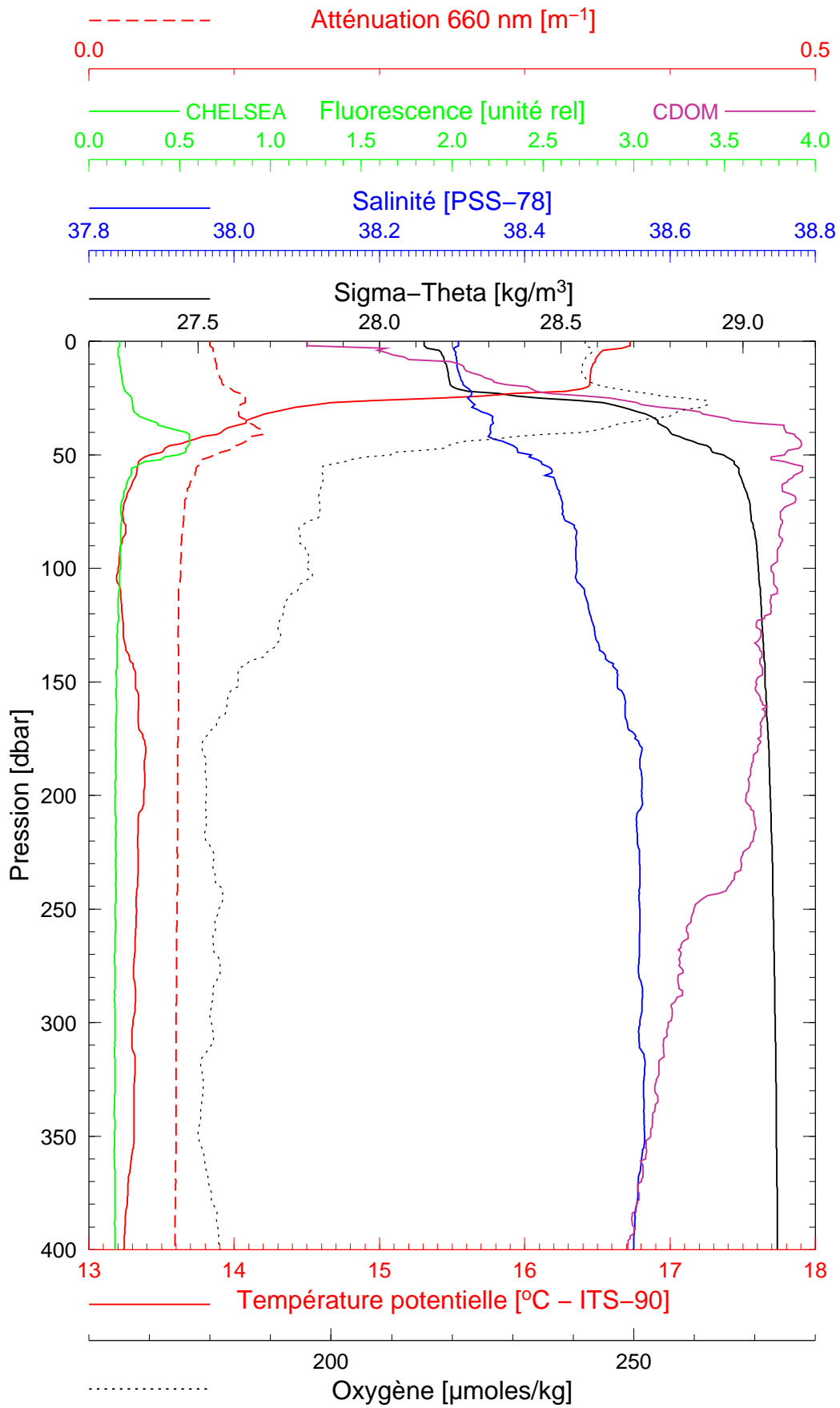
Latitude 43°22.304 N
Longitude 07°54.574 E

BOUSSOLE 123

17/05/2012

BOUS120517_02

BOUS002



Date 17/05/2012
Heure déb 12h 26min [TU]

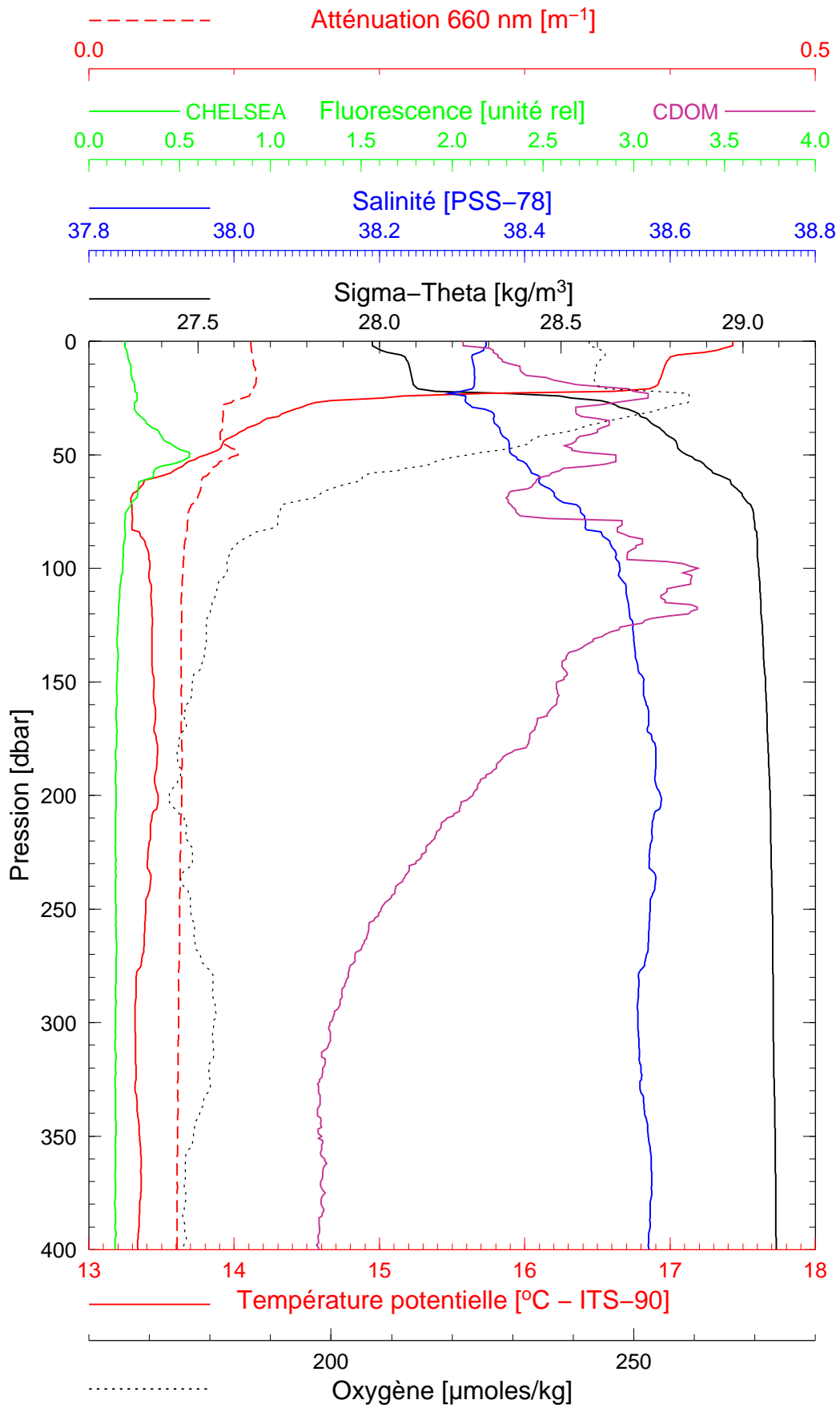
Latitude 43°22.154 N
Longitude 07°54.853 E

BOUSSOLE 123

17/05/2012

BOUS120517_03

BOUS003



Date 17/05/2012
Heure déb 13h 46min [TU]

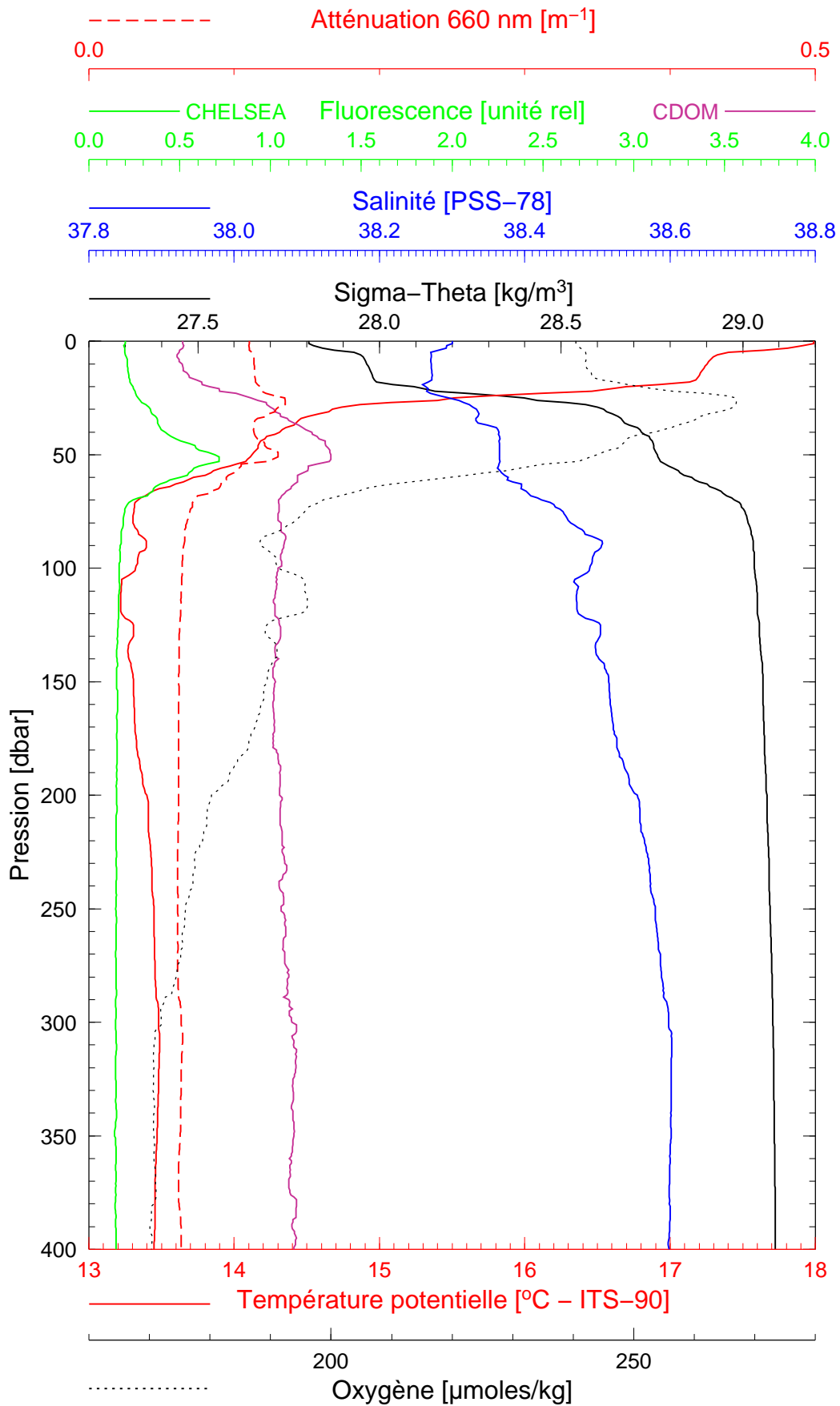
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Longitude 07°47.929 E

BOUSSOLE 123

17/05/2012

BOUS120517_04

BOUS004



Date 17/05/2012
Heure déb 14h 56min [TU]

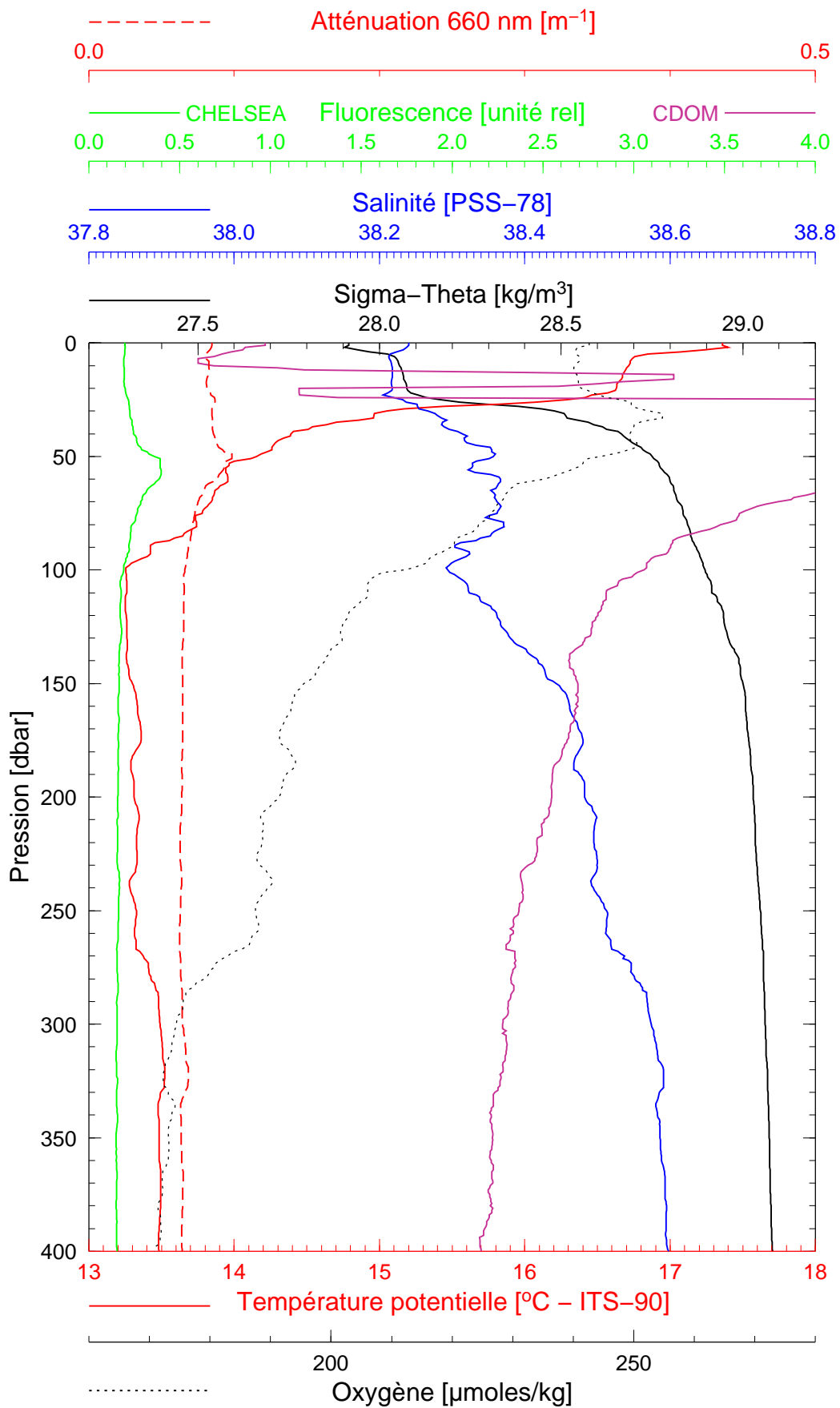
Latitude 43°27.972 N
Longitude 07°42.111 E

BOUSSOLE 123

17/05/2012

BOUS120517_05

BOUS005



Date 17/05/2012
Heure déb 16h 04min [TU]

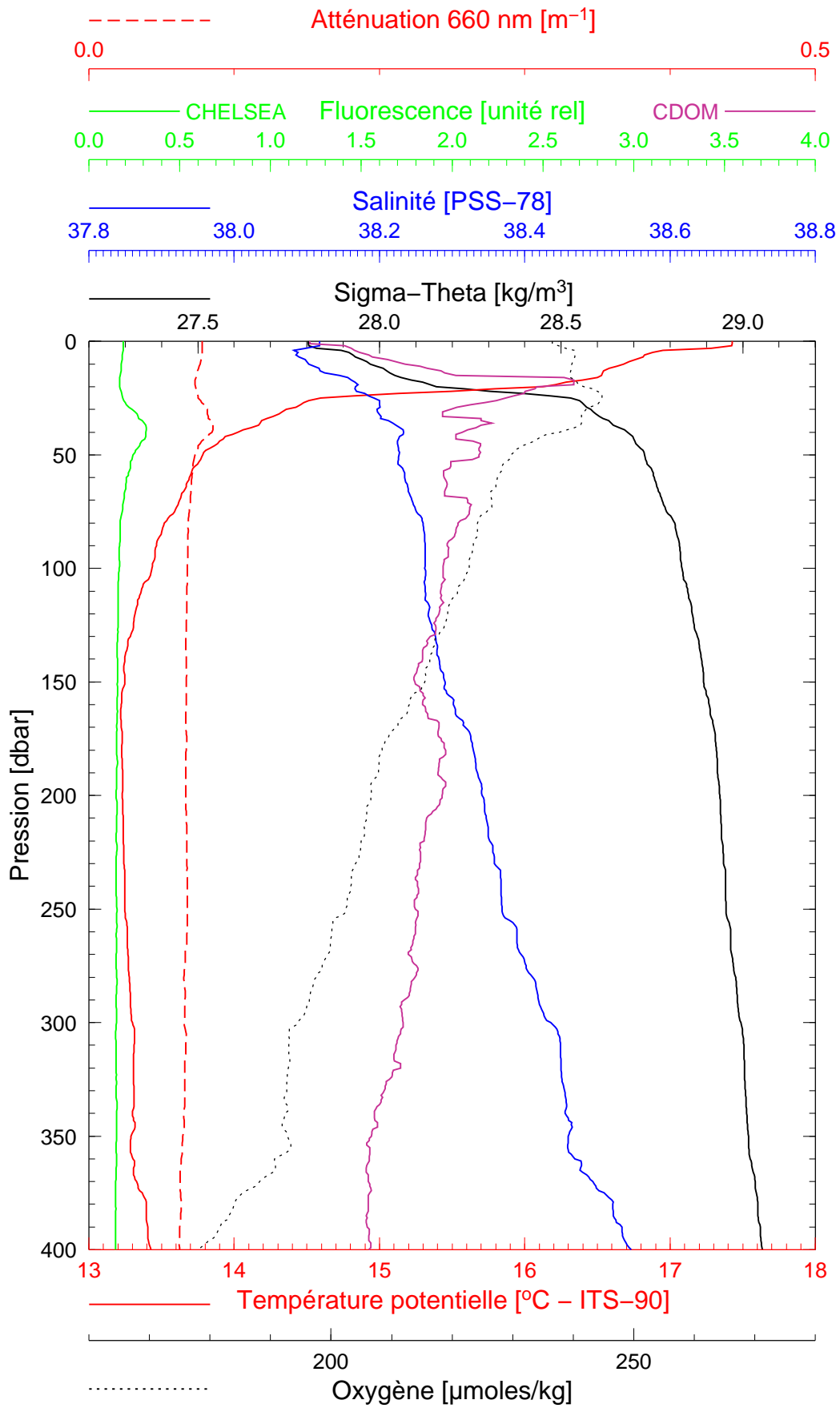
Latitude 43°30.959 N
Longitude 07°36.930 E

BOUSSOLE 123

17/05/2012

BOUS120517_06

BOUS006



Date 17/05/2012
Heure déb 17h 08min [TU]

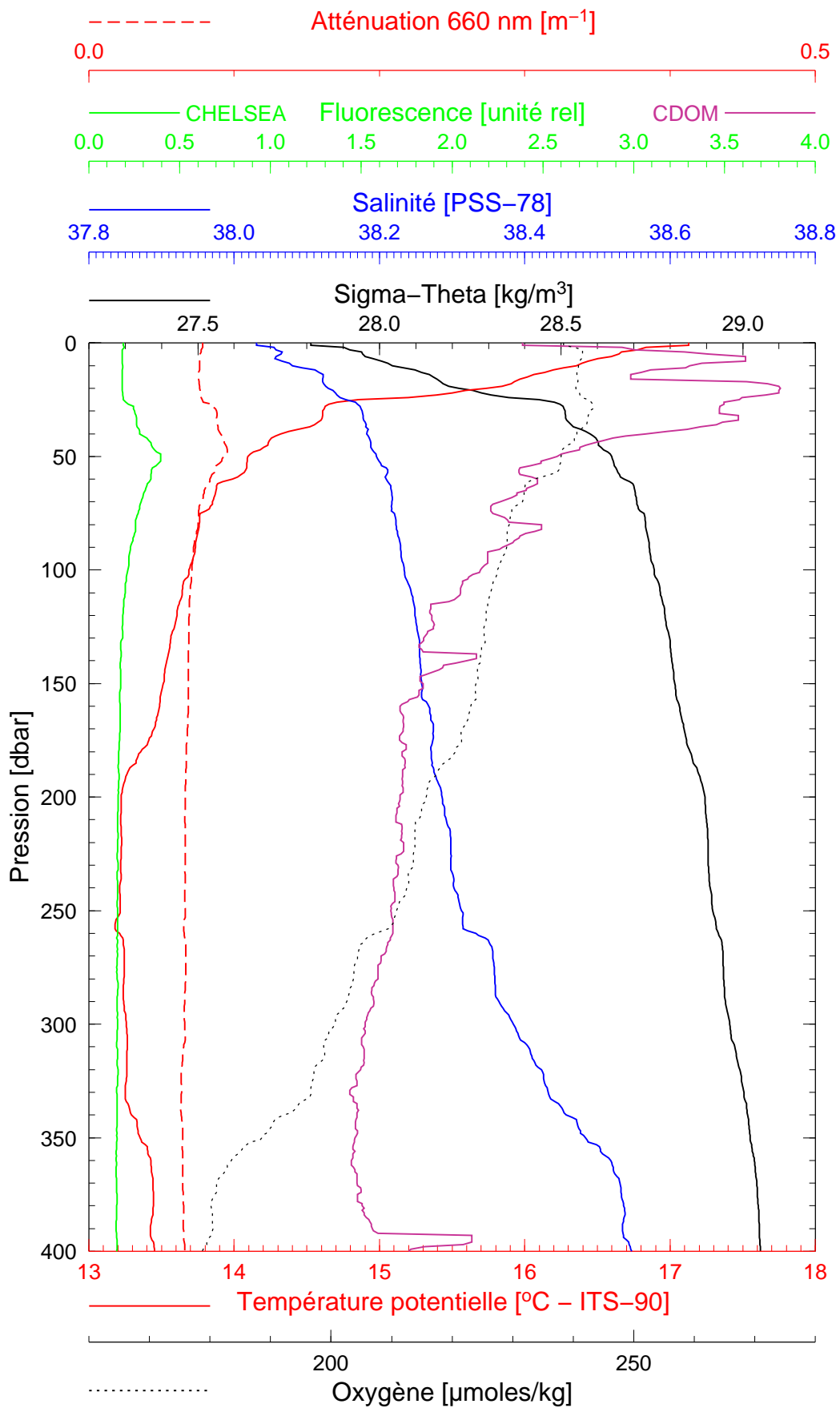
Latitude 43°33.895 N
Longitude 07°30.933 E

BOUSSOLE 123

17/05/2012

BOUS120517_07

BOUS007



Date 17/05/2012
Heure déb 18h 12min [TU]

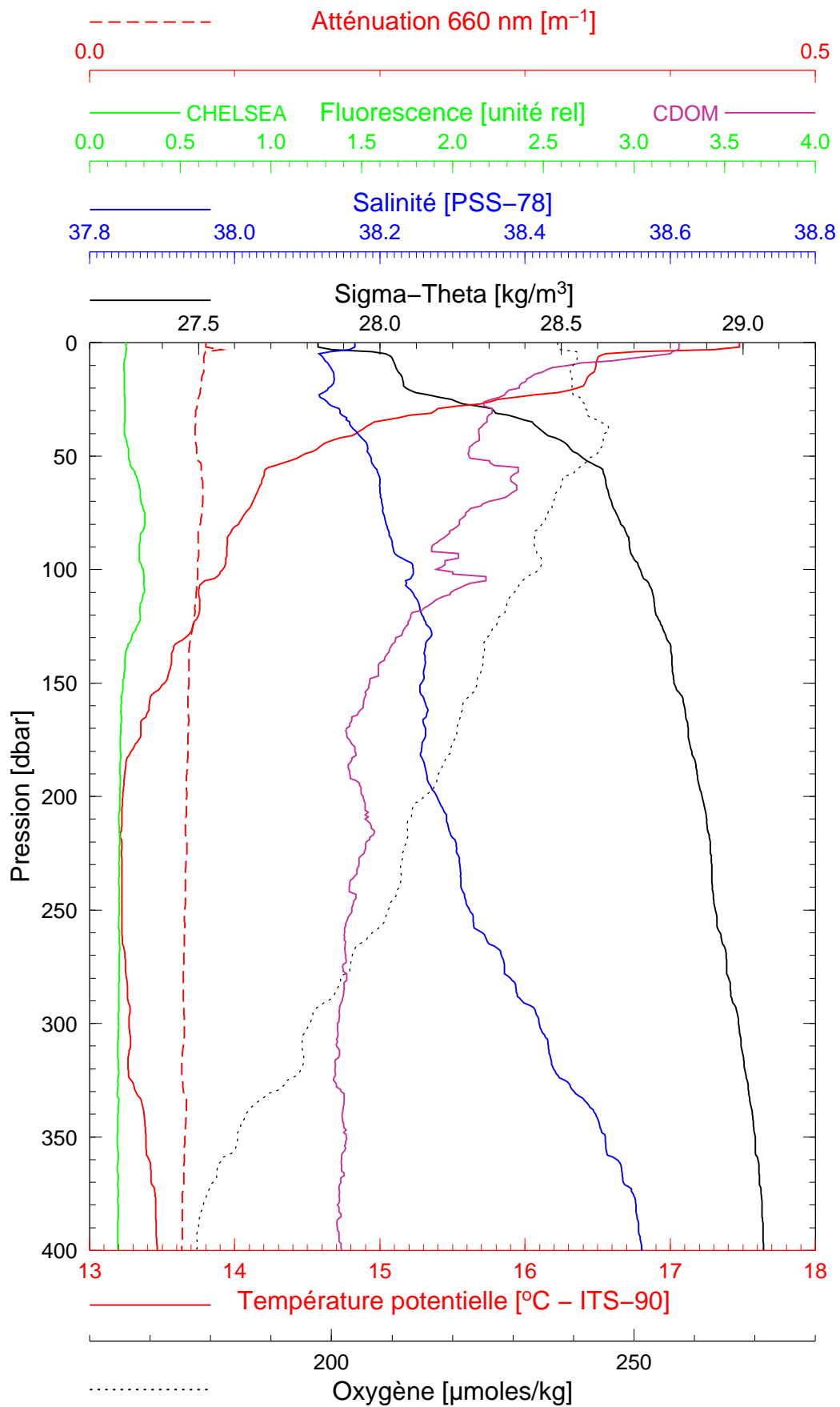
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Longitude 07°25.006 E

BOUSSOLE 123

17/05/2012

BOUS120517_08

BOUS008



Date 17/05/2012
Heure déb 19h 07min [TU]

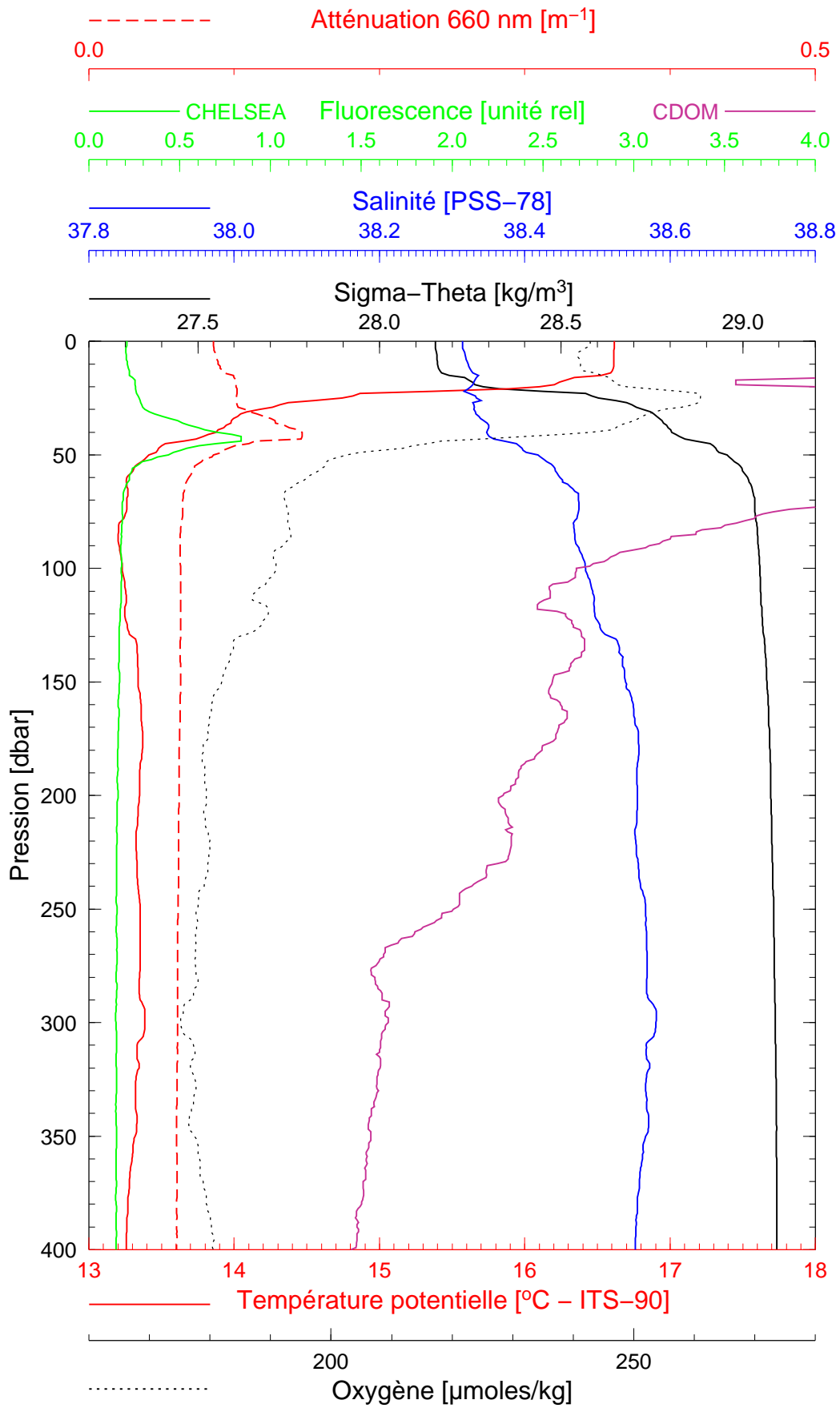
Latitude 43°39.034 N
Longitude 07°21.072 E

BOUSSOLE 123

18/05/2012

BOUS120518_01

BOUS009



Date 18/05/2012
Heure déb 12h 17min [TU]

Latitude 43°22.502 N
Longitude 07°53.470 E