

BOUSSOLE Monthly Cruise Report

Cruise 134

April 10 - 14, 2013

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Vessel: R/V Téthys II

(Captain: Rémy Lafond)

Science Personnel: Emilie Diamond, Samuel Chaffron, Melek Golbol, Yves Lamblard, David Luquet, Vincenzo Vellucci and Grégory (diver from Submarine).

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Dark current measurement of one of the BOUSSOLE buoy transmissometers. The green water indicates that the phytoplankton bloom has started.

BOUSSOLE project

ESA/ESRIN contract N° 13226/10/I-NB

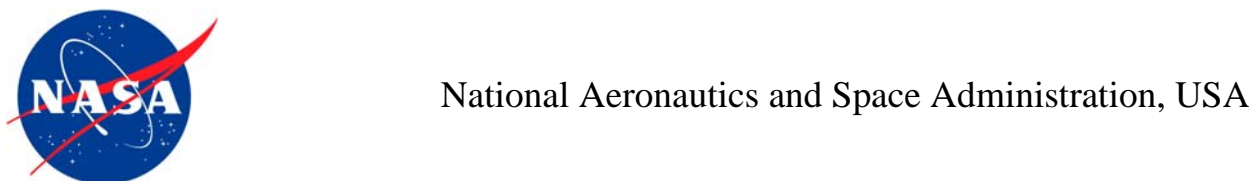
October 28, 2013



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 Wetlabs CDOM fluorometer and a Chl fluorometer, an absorption-attenuation meter (Wetlabs AC9; from July 2002), and a backscattering meter (Wetlabs Eco-BB3, from June 2003). Additional instrumentation for measurement of inherent optical properties has been added from December 2011. The new package includes a hyperspectral absorption meter (Hobilabs a-sphere), a multispectral backscattering meter (Hobilabs Hydroscat-6) and a multispectral beam transmissometer (Hobilabs Gamma-4). The CDOM fluorometer, AC9 and Eco-BB3 have been withdrawn from the CTD package from March 2013. 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) and particulate organic carbon (from October 2011) analyses in the lab. Small quantities of seawater are to be fixed with glutaraldehyde for cytometric analysis (from December 2011).
- 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).

From 2013, the BOUSSOLE cruises are coupled with one day of operations by the DYFAMED program. This coupling aims at optimizing usage of shiptime and human resources. So for one day of each cruise, there will be one deep CTD cast with water sampling for oxygen, alkalinity and nutrients analysis at the DYFAMED site and also two vertical plankton nets (0-100 m).

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

No additional operations.

Cruise Summary

The first day and the fourth day of the cruise, bad weather prevented departure from the Nice harbour. The second day was used for optical profiles, a CTD cast with water sampling at the BOUSSOLE site and the CTD transect. The third day, bad weather prevented the work at BOUSSOLE but C-OPS tests were performed in the bay of Villefranche.

The last day was used for diving operations, a CTD cast with water sampling at BOUSSOLE and a deep CTD cast with water sampling at the DYFAMED site.

Wednesday 10 April 2013

Bad weather prevented departure from the Nice harbour.

Thursday 11 April 2013

This day, the sea state was slight with a gentle breeze during the morning and with a light breeze during the afternoon. The sky was overcast.

When arrived at the BOUSSOLE site, 3 C-OPS profiles, 1 Secchi disk and 1 CTD cast with water sampling were performed.

The buoy was about 2 m below its water line, with one of the solar panels out of its axe but in good condition. A CISCO connection attempt was not successful. The solar panel was secured with a rope.

Then the CTD transect was performed.

Friday 12 April 2013

Bad weather prevented the work at the BOUSSOLE site but this day was used for C-OPS tests and plankton nets in the bay of Villefranche, where the weather conditions were better.

Saturday 13 April 2013

Bad weather prevented departure from the Nice harbour.

Sunday 14 April 2013

The last day, the sea state was calm with a gentle breeze during the morning and smooth with a light breeze during the afternoon. The sky was blue.

When arrived at the BOUSSOLE site, 1 CTD cast with water sampling was performed.

Then divers went at sea to clean the underwater sensors and perform dark measurements. In the meantime, a direct connection with the buoy was attempted through the AK connector, but did fail. The typical noise produced by the internal shutter of the hyperspectral Es sensor was however recognized, indicating that instruments were working. Therefore the failure to connect to the buoy was more likely due to a malfunctioning of the laptop or the communication cable. Divers also dismantled the pCO₂ Carioca sensor. Once on board the pCO₂ data were downloaded and the cable and laptop connectors cleaned. A second dive allowed the re-installation of the pCO₂ sensor and a direct connection with the buoy was got too.

Then 1 deep CTD cast with water sampling for the DYFAMED cruise and 1 Secchi disk were performed.

Cruise Report

Wednesday 10 April 2013 (UTC)

Bad weather prevented departure from the Nice harbour.

Thursday 11 April 2013 (UTC)

People on board: Emilie Diamond, Samuel Chaffron and Melek Golbol.

0500 Departure from the Nice harbour.

0820 Arrival at the BOUSSOLE site.

0825 C-OPS 01, 02, 03.

0930 Secchi disk 01 (8 m).

0950 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 TSM.

1200 Attempt of CISCO connection with the buoy: unsuccessful.

1215 A solar panel of the buoy was secured with a cord because it was out of its axe.

1235 Departure to the first transect station.

1310 CTD 02, 400 m, station 01 (43°25'N 07°48'E).

1410 CTD 03, 400 m, station 02 (43°28'N 07°42'E).

1505 CTD 04, 400 m, station 03 (43°31'N 07°37'E).
1600 CTD 05, 400 m, station 04 (43°34'N 07°31'E).
1710 CTD 06, 400 m, station 05 (43°37'N 07°25'E).
1750 CTD 07, 400 m, station 06 (43°39'N 07°21'E).
1810 Departure to the Nice harbour.
1850 Arrival at the Nice harbour.

Friday 12 April 2013 (UTC)

People on board: Emilie Diamond, Samuel Chaffron and Melek Golbol.

0610 Departure from the Nice harbour.
0630 Plankton nets in the bay of Villefranche.
0715 C-OPS tests in the bay of Villefranche.
0855 Arrival at the Nice harbour.

Saturday 13 April 2013

Bad weather prevented departure from the Nice harbour.

Sunday 14 April 2013 (UTC)

People on board: Emilie Diamond, Melek Golbol, Vincenzo Vellucci and 3 divers.

0505 Departure from the Nice harbour.
0830 Arrival at the BOUSSOLE site.
0820 CTD 08, 400 m with water sampling at 400, 200, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p , POC, CDOM and cytometry.
0915 Direct connection with the buoy : not succesful.
0925 Diving on the buoy for cleaning instruments and making dark measurements.
Divers dismounted the pCO₂ Carioca sensor.
Cleaning of the cable and laptop connectors on board.
11:00 Second dive for the re-installation of the pCO₂ sensor.
Direct connection with the buoy (AK DacNet connector).
1155 Secchi disk 02 (9 m).
1205 CTD MOOSE 63, 2400m with water sampling
1330 Departure to the Nice harbour.
1635 Arrival at the Nice harbour.

Problems identified during the cruise

- One of the solar panel of the buoy was out of its axe, it was just secured with a rope.

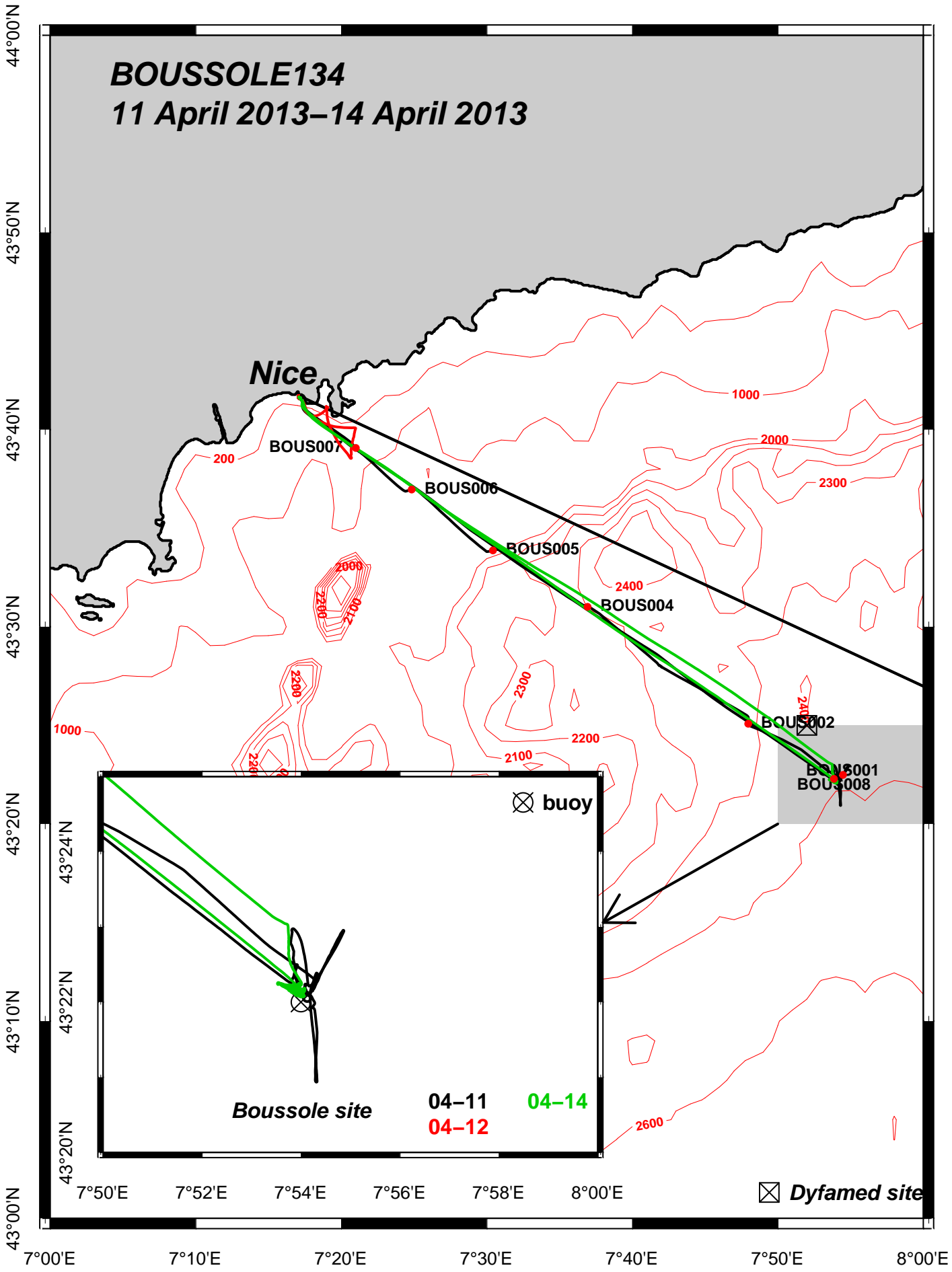
Appendices

Cruise Summary Table for Boussole 134

Date	Black names (file ext: ".raw")	Profile names (file extension: ".raw")	CTD notées / satellite overpass	Other sensors	Start Time GMT (hour.min)	Duration (min.sec)	Depth max (meter)	Latitude (N) (Degree)	Longitude (Minute)	Longitude (Degree)	Longitude (Minute)	Sky	Clouds	Quantity (#/8)	Weather Wind sp. (kn)	Wind dir.	Atm. Pressure (hPa)	Humidity (%)	Visibility	T air	T water	Sea	Sea Swell H (m)	Swell dir.	Whitecaps
10/04/13																									
11/04/13	bou_c-ops_130311	0822_001_data.csv			08:25	1:21																			
		bou_c-ops_130411	0832_001_data.csv		08:46	3:12	78.2	43	22.339	7	53.879	overcast	Ns&Sc	8	13	72	1015.0	86	medium	13.6		calm	0.8		no
		bou_c-ops_130411	0832_002_data.csv		08:58	3:49	90.6	43	22.569	7	53.847	overcast	Ns&Sc	8	13	72	1015.0	86	medium	13.6		calm	0.8		no
		bou_c-ops_130411	0832_003_data.csv		09:11	2:40	66.6	43	22.822	7	53.798	overcast	Ns&Sc	8	13	72	1015.0	86	medium	13.6		calm	0.8		no
	bou_c-ops_130411	0832_004_data.csv			09:34	2:22																			
				Secchi01	09:30	4:00	8	43	22	7	54	overcast		8					medium			calm			no
			CTDBOUS001	HPLC, Ap & TSM	9:50	33:00	400	43	22.488	7	54.479	overcast		8	8	115	1015.4	88		13.8	13.4	calm			
			CTDBOUS002		13:52	24:00	400	43	25.083	7	47.970	overcast		8	10	256	1014.8	92		13.7	13.6	calm			
			CTDBOUS003		14:11	22:00	400	43	27.988	7	41.993	overcast		7	7	264	1013.9	92		13.8	13.5	calm			
			CTDBOUS004		15:05	23:00	400	43	31.013	7	36.928	overcast		8	3	330	1013.7	92		13.7	13.8	calm			
			CTDBOUS005		16:02	25:00	400	43	33.874	7	30.429	overcast		8	10	290	1012.9	92		13.9	14.2	calm			
			CTDBOUS006		17:02	25:00	400	43	36.961	7	24.846	overcast		7	8	153	1012.8	85		15.5	13.8	calm			
			CTDBOUS007		17:53	25:00	400	43	39.070	7	21.007	overcast		8	9	50	1012.7	85		15.5	13.8	calm			
12/04/13																									
13/04/13																									
14/04/13			CTDBOUS008	HPLC, Ap, CDOM, POC & cyto	8:38	30:00	400	43	22.228	7	53.858	blue		1	15	103	1027.6	89		13.9	13.6	calm			
				Secchi02	13:10	4:00	9	43	22	7	54	blue							good						

BOUSSOLE134

11 April 2013–14 April 2013

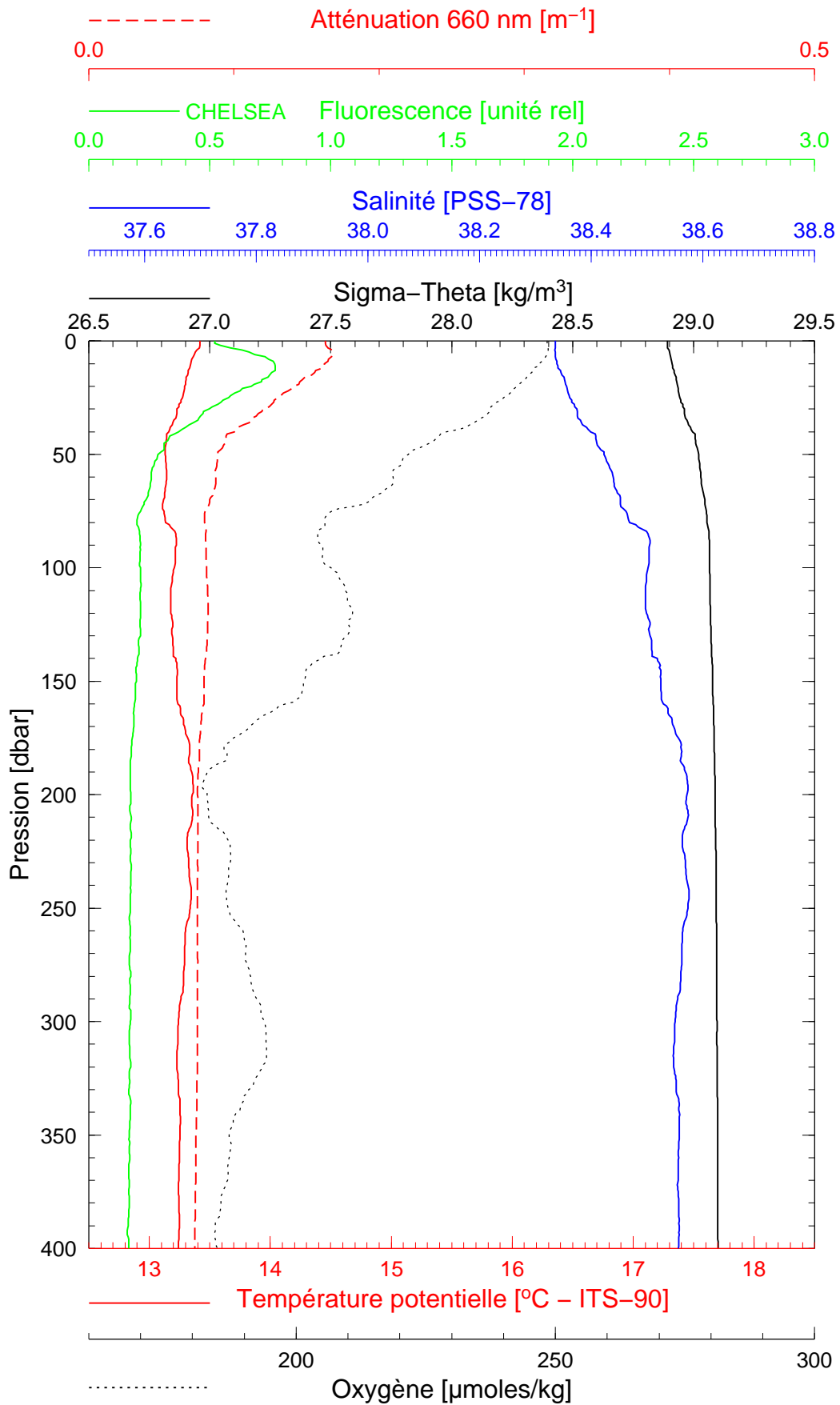


BOUSSOLE 134

11/04/2013

BOUS130411_01

BOUS001



Date 11/04/2013
Heure déb 09h 50min [TU]

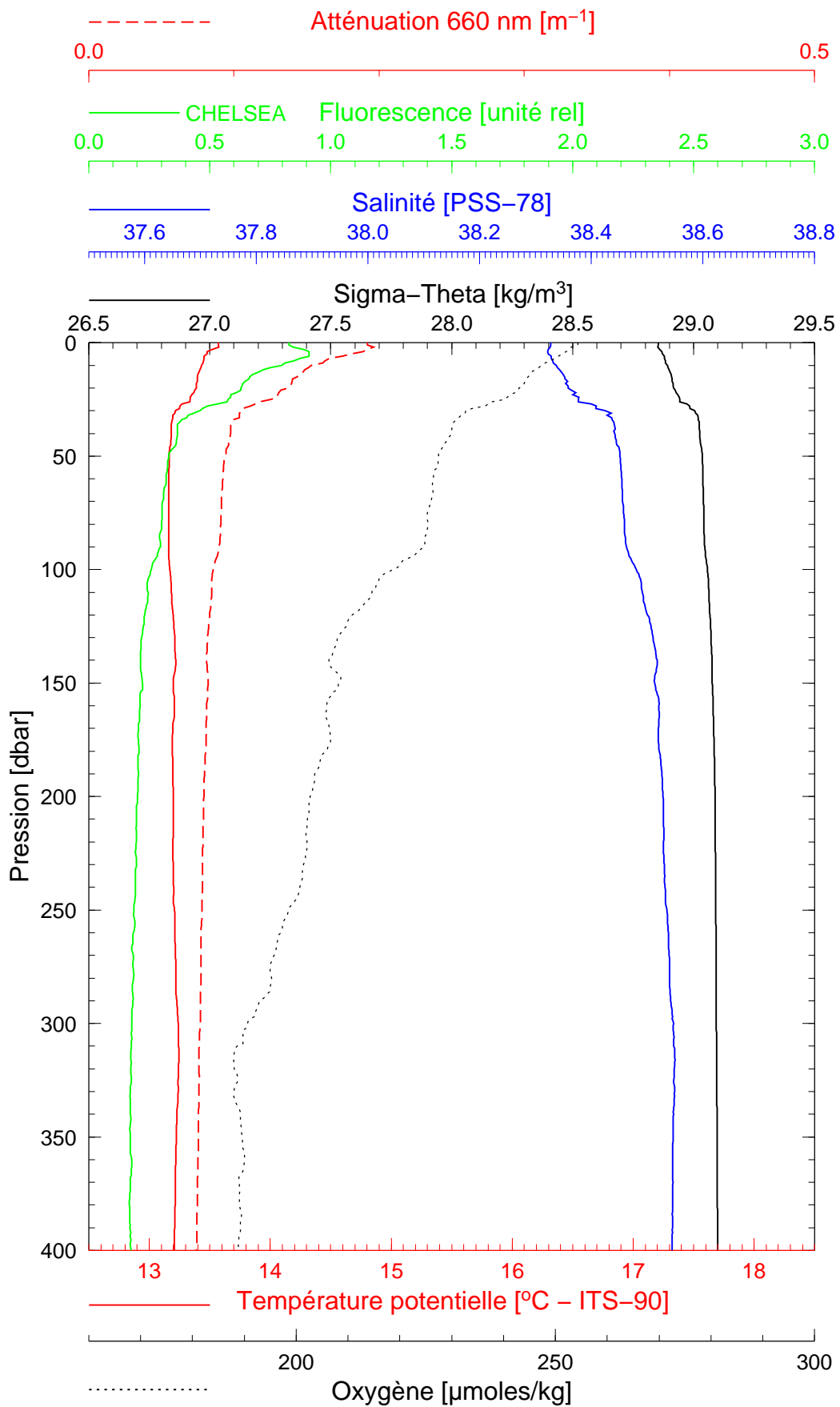
Latitude 43°22.488 N
Longitude 07°54.479 E

BOUSSOLE 134

11/04/2013

BOUS130411_02

BOUS002



Date 11/04/2013
Heure déb 13h 14min [TU]

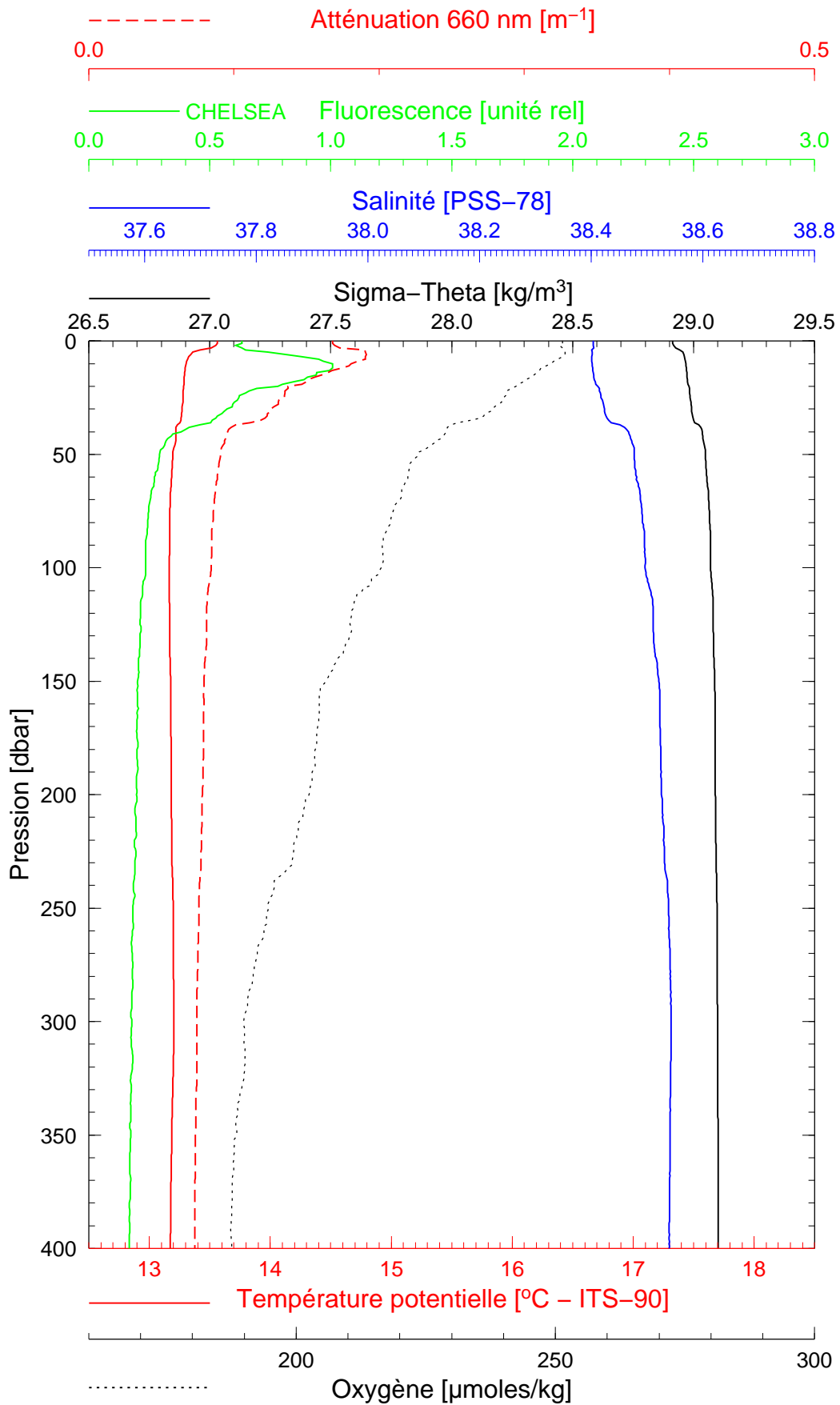
Latitude 43°25.083 N
Longitude 07°47.970 E

BOUSSOLE 134

11/04/2013

BOUS130411_03

BOUS003



Date 11/04/2013
Heure déb 14h 11min [TU]

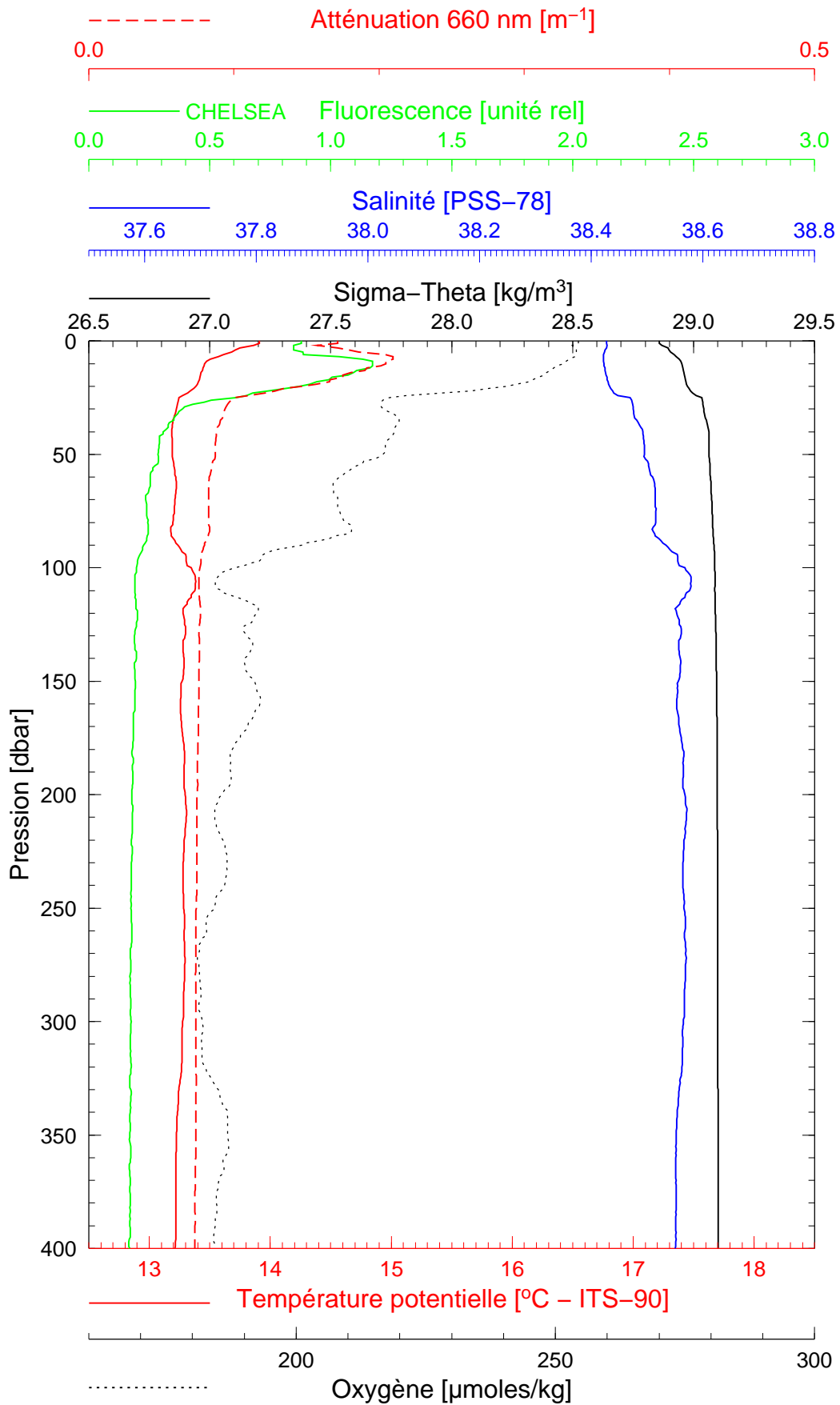
Latitude 43°27.788 N
Longitude 07°41.993 E

BOUSSOLE 134

11/04/2013

BOUS130411_04

BOUS004



Date 11/04/2013
Heure déb 15h 05min [TU]

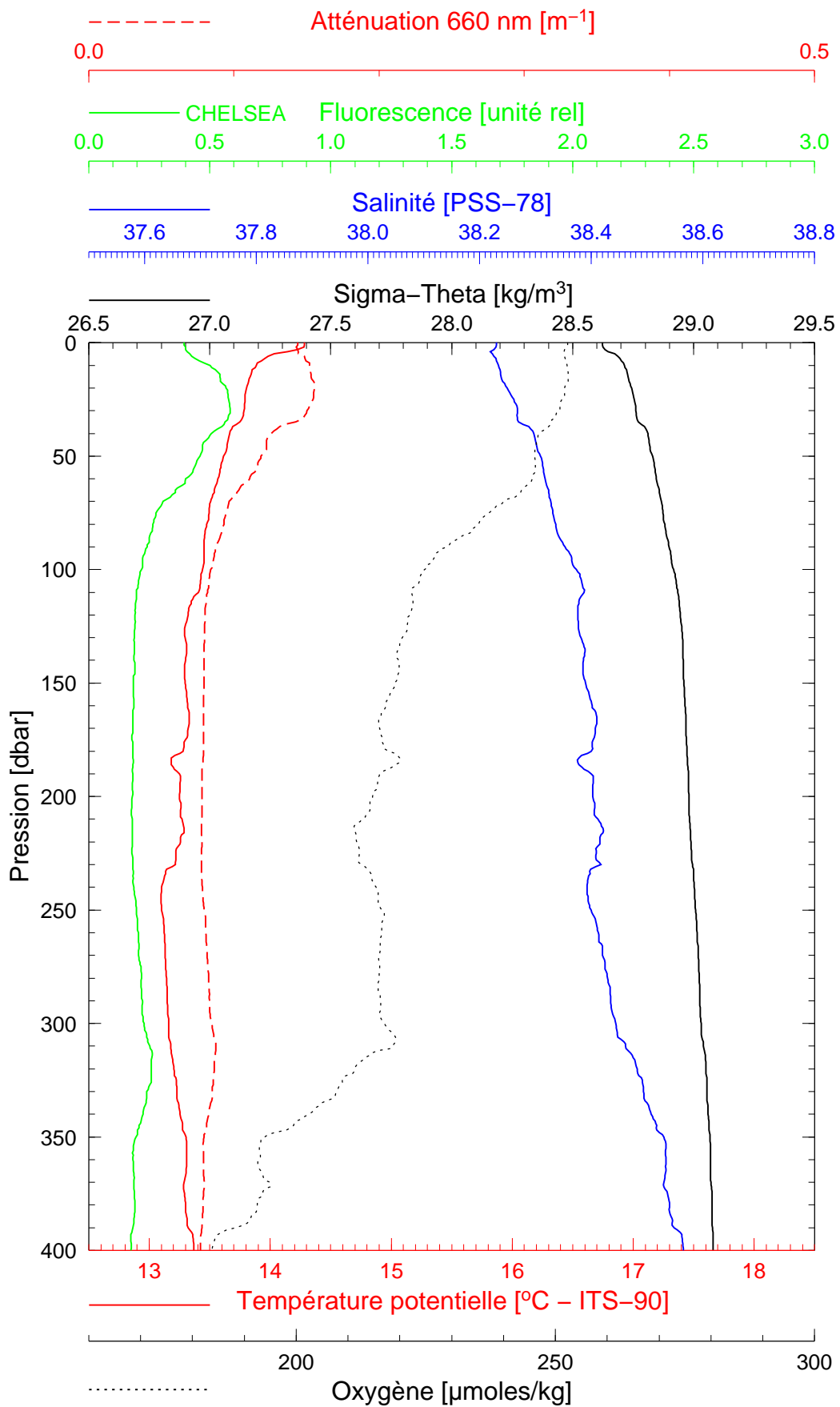
Latitude 43°31.013 N
Longitude 07°36.928 E

BOUSSOLE 134

11/04/2013

BOUS130411_05

BOUS005



Date 11/04/2013
Heure déb 16h 02min [TU]

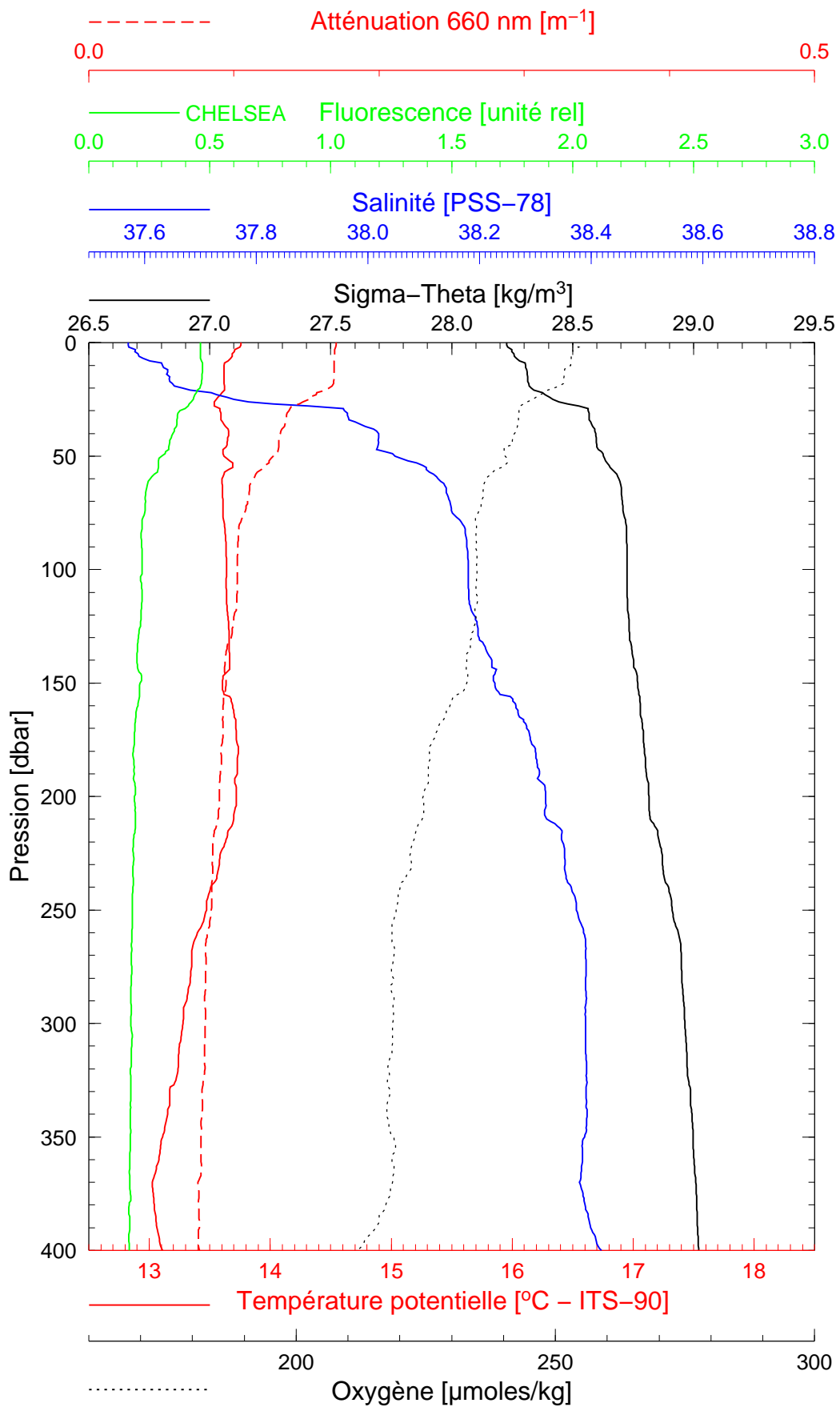
Latitude 43°33.874 N
Longitude 07°30.429 E

BOUSSOLE 134

11/04/2013

BOUS130411_06

BOUS006



Date 11/04/2013

Latitude 43°36.961 N

Heure déb 17h 02min [TU]

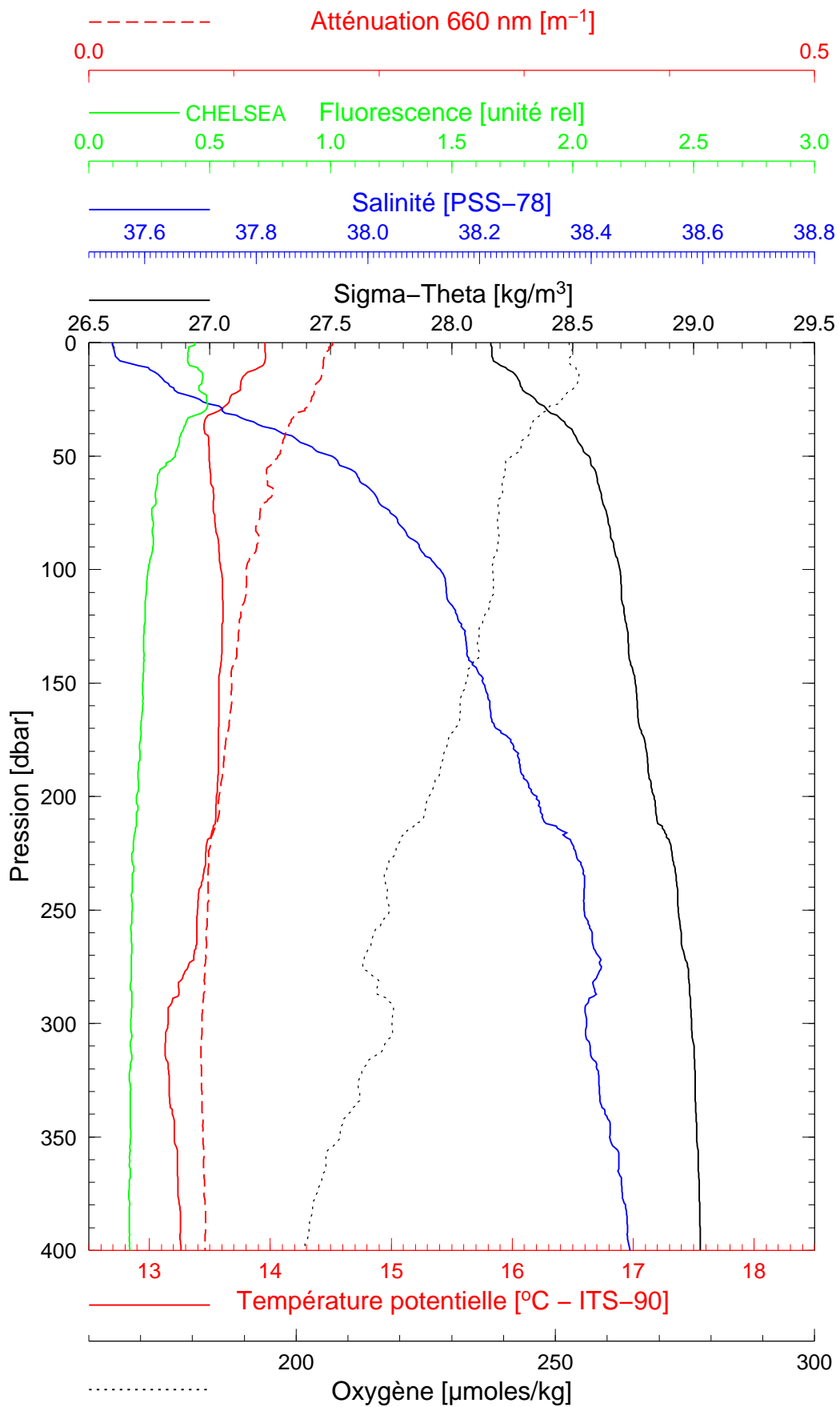
Longitude 07°24.846 E

BOUSSOLE 134

11/04/2013

BOUS130411_07

BOUS007



Date 11/04/2013
Heure déb 17h 53min [TU]

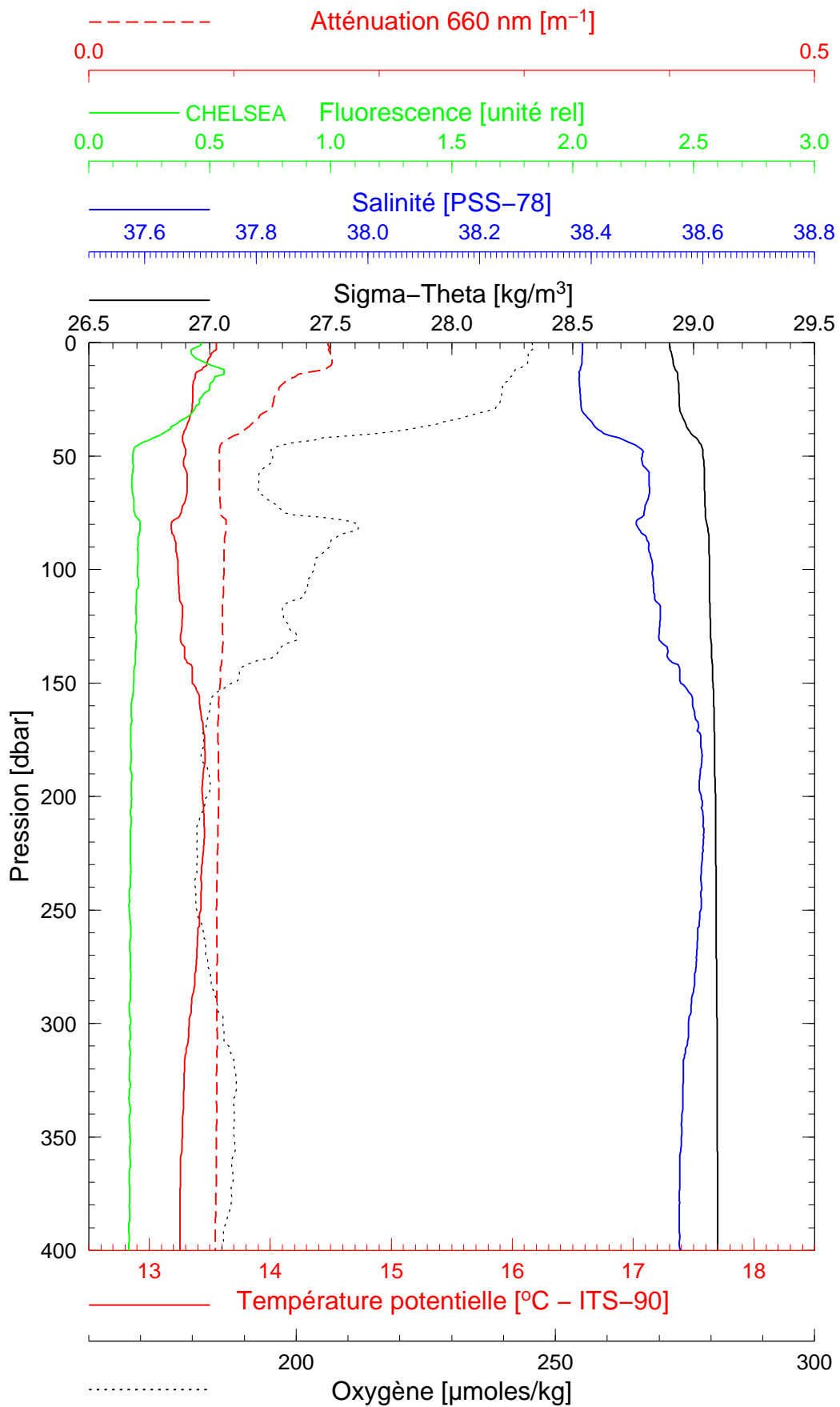
Latitude 43°39.070 N
Longitude 07°21.007 E

BOUSSOLE 134

14/04/2013

BOUS130414_01

BOUS008



Date 14/04/2013
Heure déb 08h 31min [TU]

Latitude 43°22.288 N
Longitude 07°53.858 E