BOUSSOLE Monthly Cruise Report

Cruise 135
May 15 - 18, 2013

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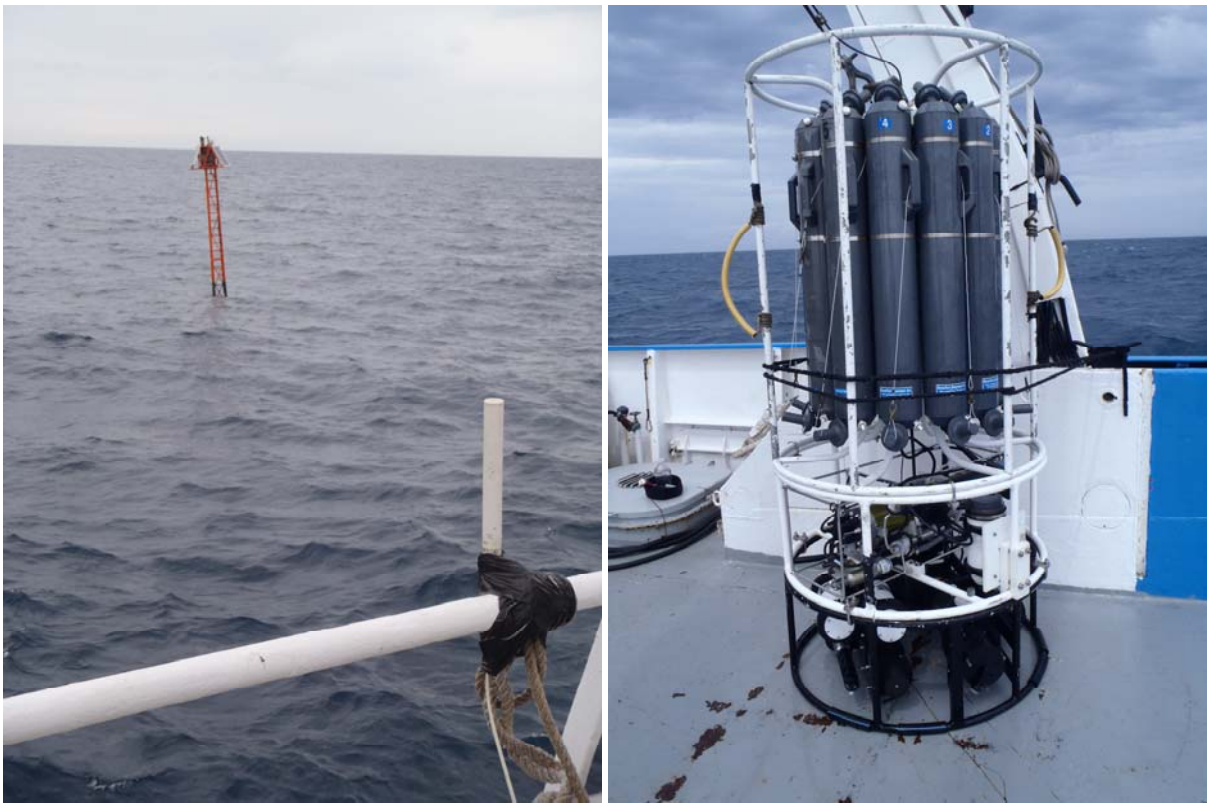
Vessel: R/V Téthys II
(Captain: Rémy Lafond)

Science Personnel: Emilie Diamond and Melek Golbol.

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



BOUSSOLE data retrieval through the CISCO antenna (left picture) and the CTD Rosette on the R/V *Tethys II* deck (right picture).

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

European Space Agency

Centre National d'Etudes Spatiales, France

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 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 ship time 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 was spent at the BOUSSOLE site for a CTD cast with water sampling, 1 secchi disk, and a CISCO connection to the buoy. The same day, we performed one part of the CTD transect. The second day and the third day, bad weather prevented departure from the Nice harbour. The last day was used for a deep CTD cast with water sampling at the DYFAMED site and to complete the CTD transect.

Wednesday 15 May 2013

This day the sea state was slight with a gentle breeze. The sky was overcast. When arrived at the BOUSSOLE site, 1 Secchi disk and 1 CTD cast with water sampling were performed. A CISCO connection was attempted and CTD casts were performed in some of the transect stations.

Thursday 16 May 2013

Bad weather prevented departure from the Nice harbour.

Friday 17 May 2013

Bad weather prevented departure from the Nice harbour.

Saturday 18 May 2013

The last day, the sea state was slight with a moderate breeze. The sky was overcast and it rained. One deep CTD cast with water sampling was performed for the DYFAMED program. CTD casts were performed at some of the transect stations.

Cruise Report

Wednesday 15 May 2013 (UTC)

People on board: Emilie Diamond and Melek Golbol.

0435 Departure from the Nice harbour.
0800 Arrival at the BOUSSOLE site.
0810 Secchi disk 01 (11 m).
0815 CTD 01, 400 m with water sampling at 400, 200, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p, POC and CDOM.
0900 Attempt of CISCO connection with the buoy: unsuccessful.
0910 C-OPS: Problem of wiring: no optical profiles.
0915 Filtrations.
1000 CISCO connection with the buoy and data retrieval (50%).
1015 Departure to the first transect station.
1130 CTD 02, 400 m, station 01 (43°25'N 07°48'E).
1225 CTD 03, 400 m, station 02 (43°28'N 07°42'E).
1320 Arrival at station 03 (43°31'N 07°37'E), bad weather: no CTD.
Departure to station 05 (Station 04, no authorization: no CTD).
1420 Arrival at station 05 (43°37'N 07°25'E), bad weather: no CTD
1440 Arrival at station 06(43°39'N 07°21'E), bad weather: no CTD.
Departure to the Nice harbour.
1515 Arrival at the Nice harbour.

Thursday 16 May 2013

Bad weather prevented departure from the Nice harbour.

Friday 17 May 2013

Bad weather prevented departure from the Nice harbour.

Saturday 18 May 2013 (UTC)

People on board: Emilie Diamond, Melek Golbol.

0415 Departure from the Nice harbour.
0745 Arrival at the BOUSSOLE site.
0745 Deep CTD, 2400m with water sampling at 200, 150, 100, 80, 40, 25 and 10m for cytometry.
1000 Attempt of CISCO connection with the buoy: unsuccessful.
1005 Departure to the station 03.
Station 03 and 04, bad weather: no CTD.

1240 CTD 04, 400 m, station 05 (43°37’N 07°25’E).
1330 CTD 05, 400 m, station 06 (43°39’N 07°21’E).
1400 Departure to the Nice harbour.
1420 Arrival at the Nice harbour.

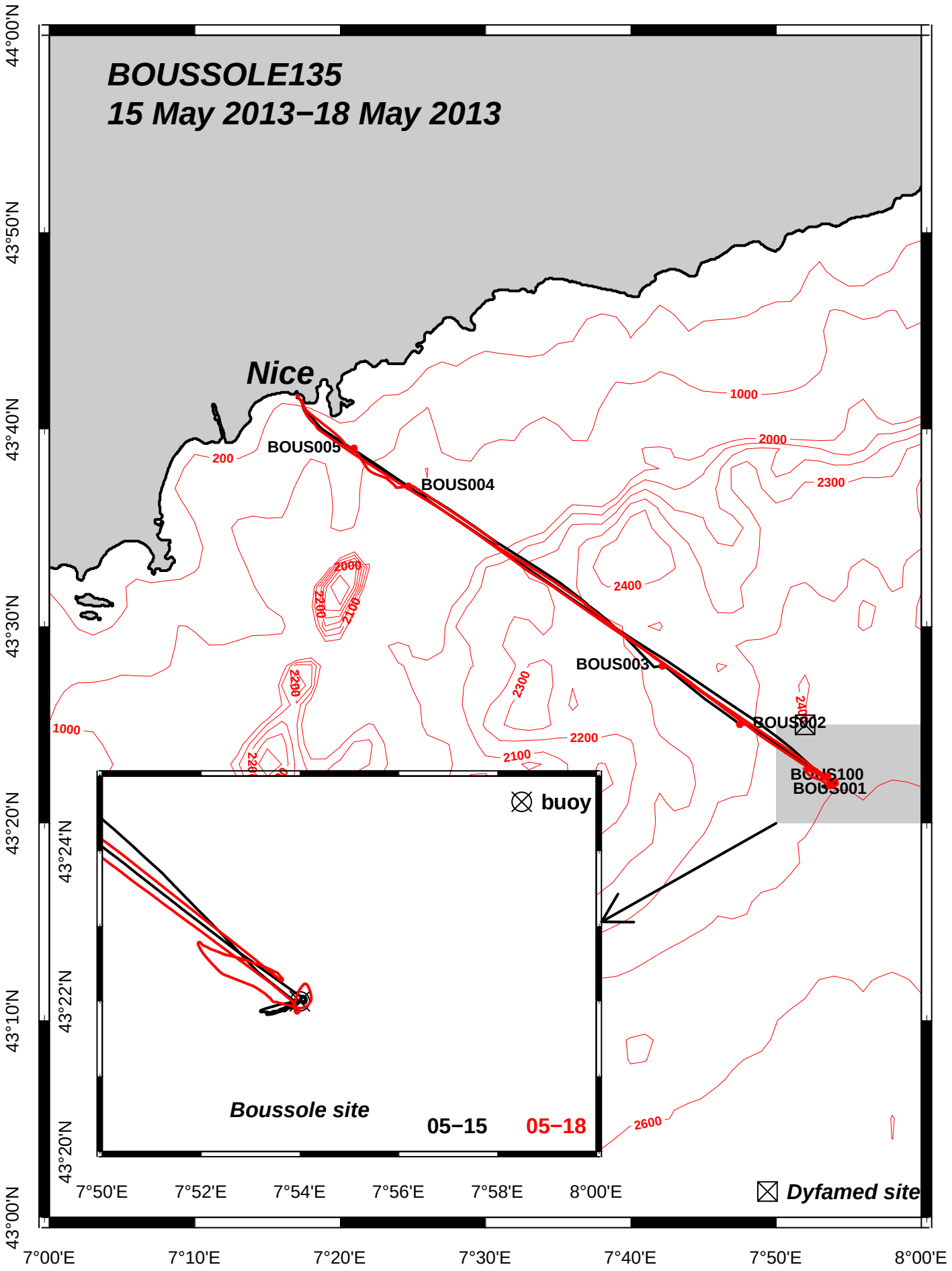
Problems identified during the cruise

- The optical profiles were not performed because of lacking of a USB serial adapter cable.
- The first day, the CISCO connection with the buoy was incomplete so that only about half of the data were retrieved.

Appendices

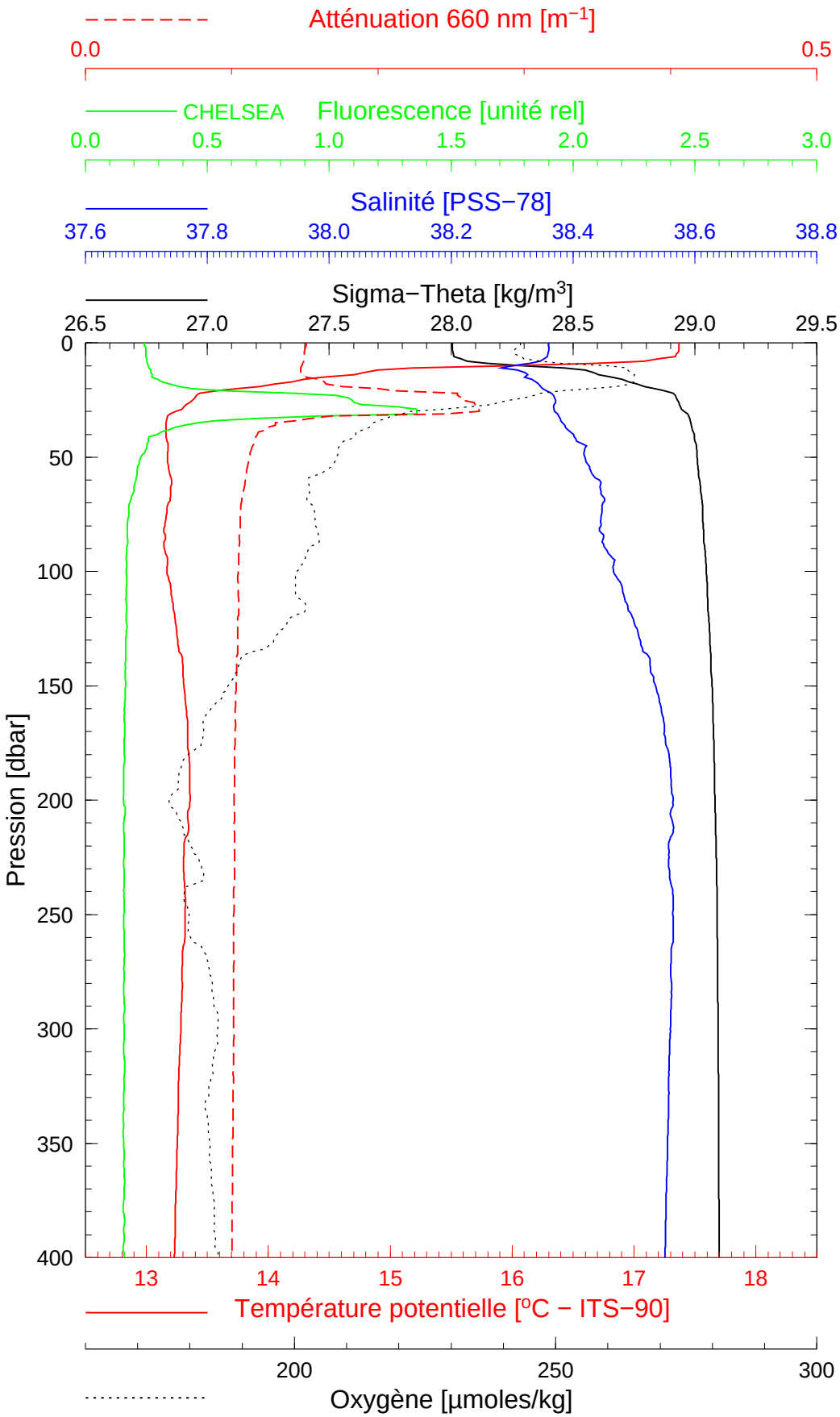
Cruise Summary Table for Boussole 135

Date	Black names	Profile names	CTD notées /	Other sensors	Start Time	Duration	Depth max	Latitude (N)		longitude					Weather							Sea		
	(file ext: ".raw")	(file extension: ".raw")	satellite overpass		GMT (hour.min)	(min.sec)	(meter)	(Degree)	(Minute)	(Degree)	(Minute)	Sky	Clouds	Quantity (#/8)	Wind sp. (kn)	Wind dir.	Atm. Pressure (hPa)	Humidity (%)	Visibility	T air	T water	Sea	Swell H (m)	Swell dir.	Whitecaps
				Secchi01	08:10	4:00	11	43	22	7	54	overcast		8								calm			
15/05/13			CTDBOUS001	HPLC, Ap, TSM, CDOM and POC	8:18	34:00	400	43	21.921	7	53.702	overcast		8	10	273	1005.0	83		17.6	17.4	calm			
			CTDBOUS002		11:29	22:00	400	43	25.028	7	47.513	overcast		8	15	111	1005.0	80		18.0	17.2	calm			
			CTDBOUS003		12:24	26:00	400	43	27.991	7	42.189	overcast		8	20	93	1005.0	80		18.4	18.0	calm			
16/05/13	Bad weather																								
17/05/13	Bad weather																								
18/05/13			CTDBOUS100	Cyto	7:47	89:00	2400	43	22.385	7	53.525	overcast		8	11	152	1012.0	77		16.6	16.7	calm			
			CTDBOUS004		12:42	26:00	400	43	37.105	7	24.699	rainy		8	20	43	1013.0	76		14.2	17.2	calm			
			CTDBOUS005		13:33	25:00	400	43	39.028	7	20.959	rainy		8	14	41	1012.0	78		14.2	17.4	moved			


BOUSSOLE135
15 May 2013−18 May 2013
Nice
BOUS005
BOUS004
BOUS003
BOUS002
BOUS100
BOUS001
200
1000
2000
2100
2200
2300
2400
2600
buoy
Boussole site
05−15
05−18
Dyfamed site
44°00'N
43°50'N
43°40'N
43°30'N
43°20'N
43°10'N
43°00'N
7°00'E
7°10'E
7°20'E
7°30'E
7°40'E
7°50'E
8°00'E
43°24'N
43°22'N
43°20'N
7°50'E
7°52'E
7°54'E
7°56'E
7°58'E
8°00'E

BOUSSOLE 135 **15/05/2013** **BOUS130515_01**

BOUS001

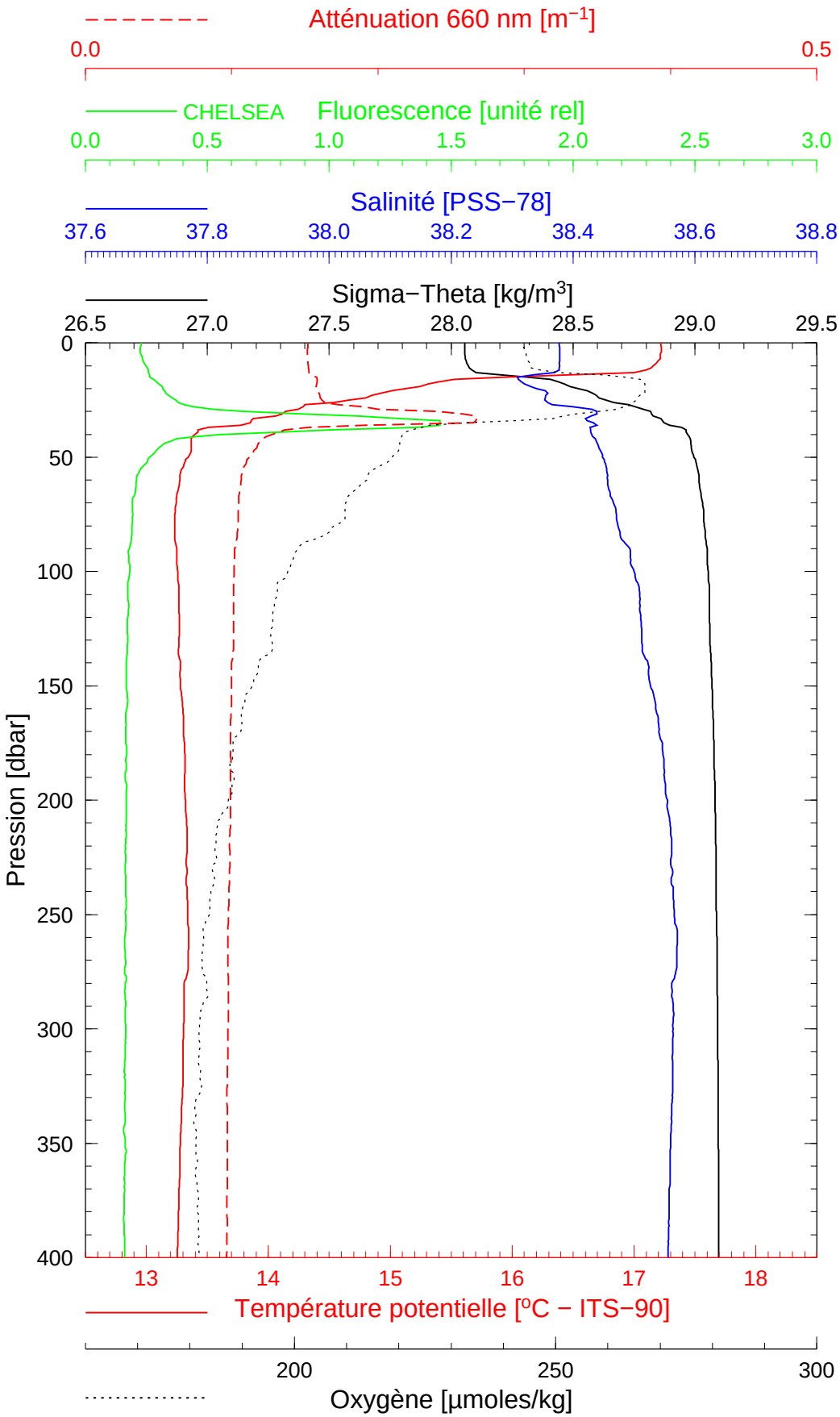


Date *15/05/2013* *Latitude* *43°21.921 N*

Heure déb *08h 18min [TU]* *Longitude* *07°53.702 E*

BOUSSOLE 135 **15/05/2013** **BOUS130515_02**

BOUS002

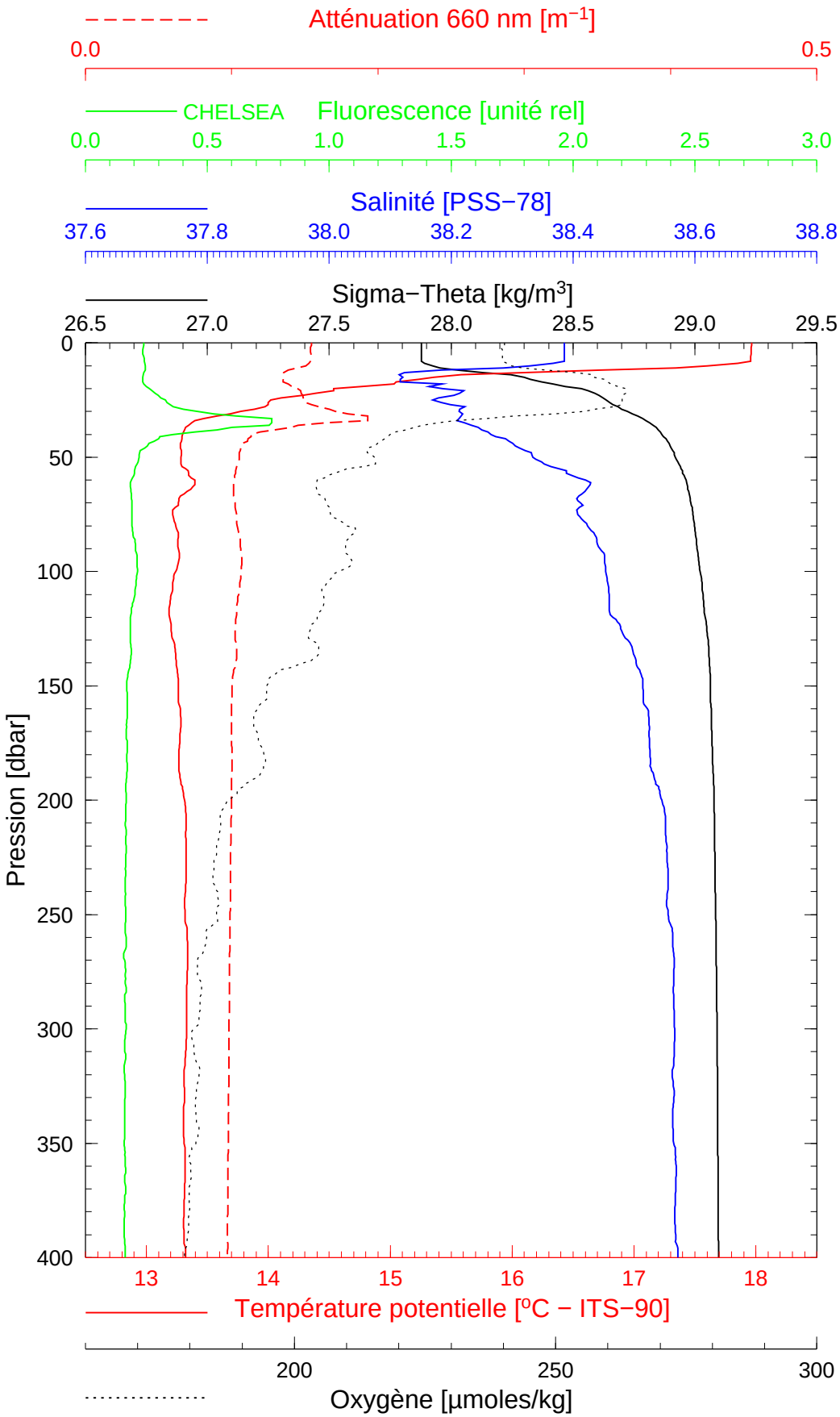


Date *15/05/2013* *Latitude* *43°25.028 N*

Heure déb *11h 29min [TU]* *Longitude* *07°47.513 E*

BOUSSOLE 135 **15/05/2013** **BOUS130515_03**

BOUS003

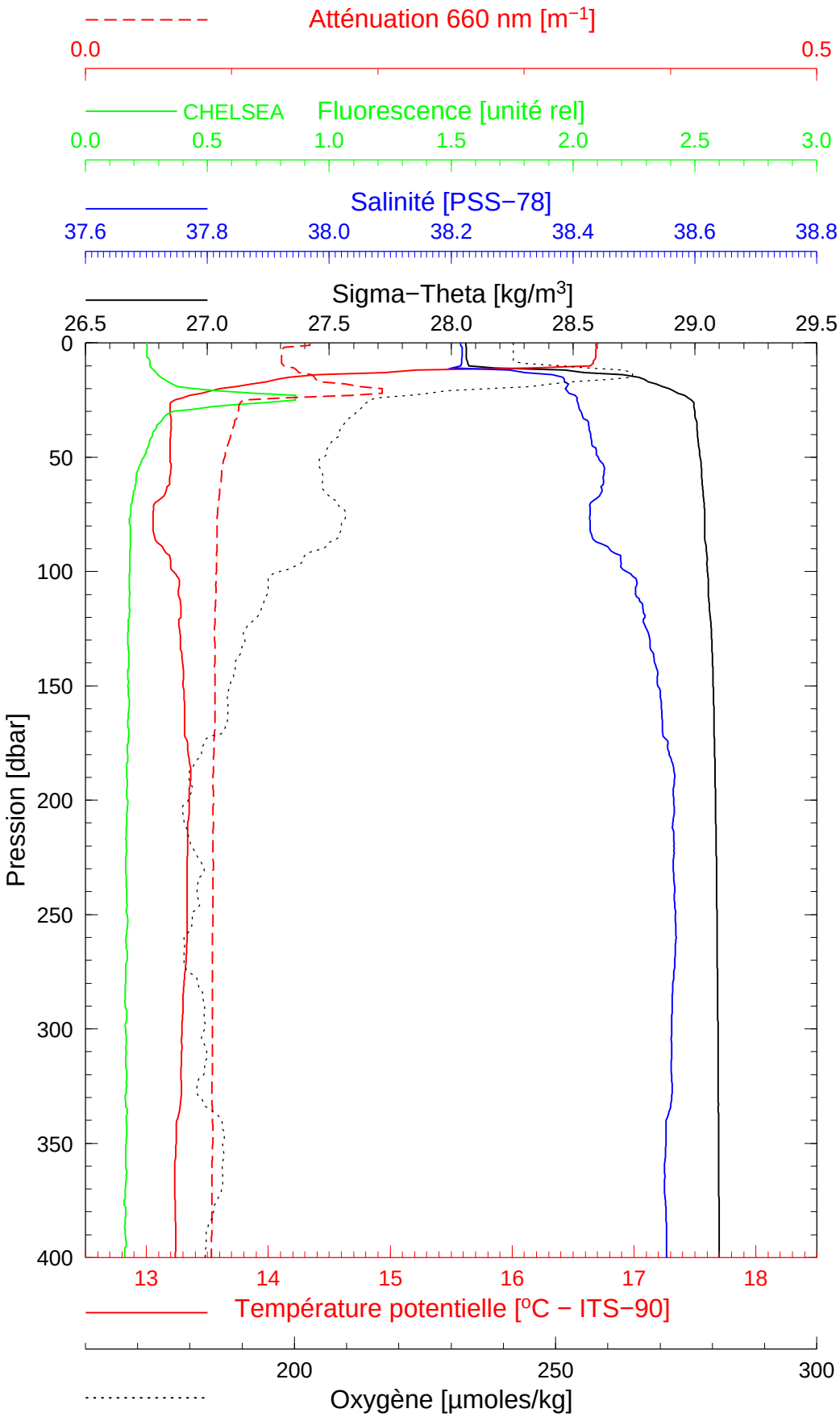


Date *15/05/2013* *Latitude* *43°27.991 N*

Heure déb *12h 24min [TU]* *Longitude* *07°42.189 E*

BOUSSOLE 135 **18/05/2013** **BOUS130518_01**

BOUS100

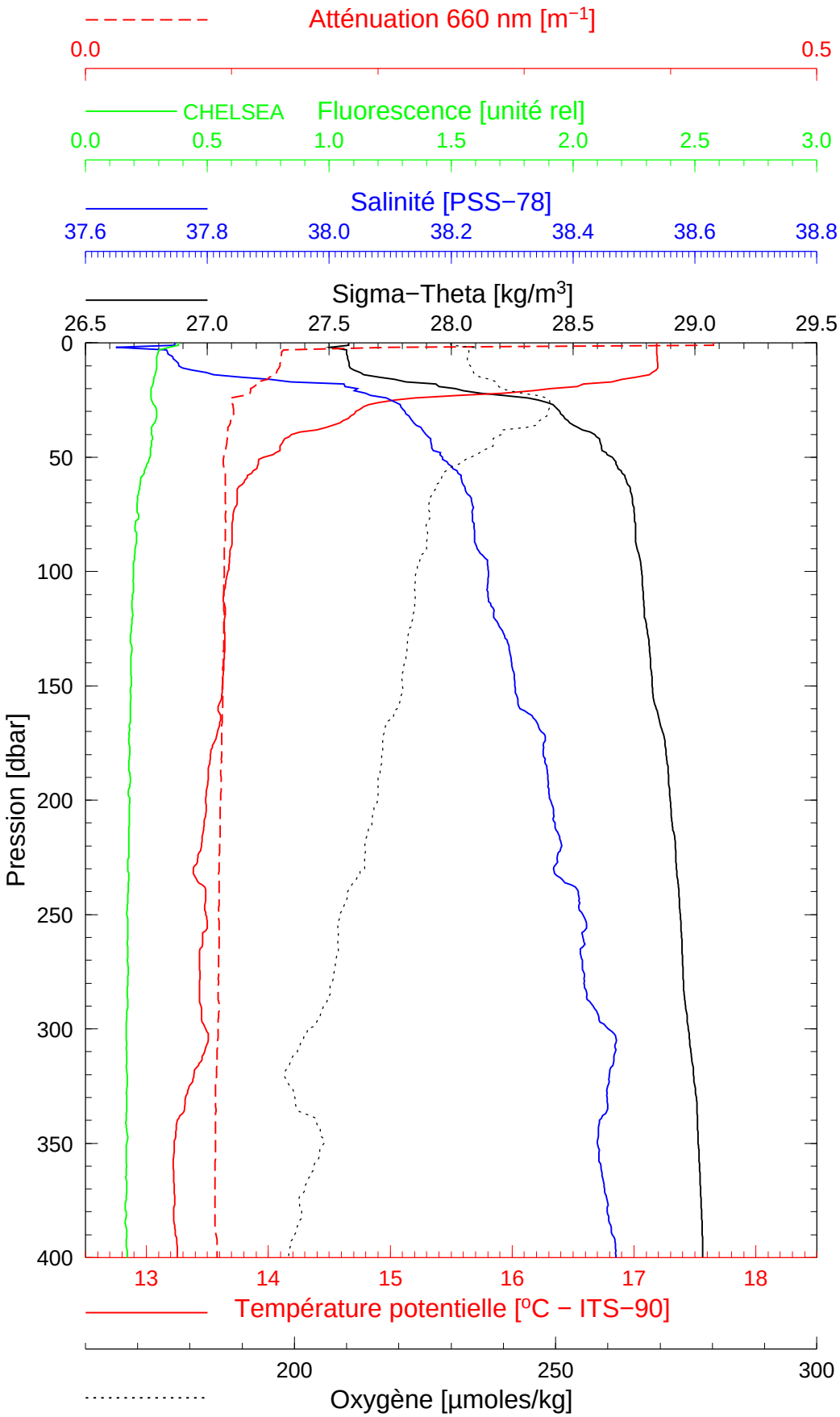


Date *18/05/2013* *Latitude* *43°22.385 N*

Heure déb *07h 47min [TU]* *Longitude* *07°53.525 E*

BOUSSOLE 135 **18/05/2013** **BOUS130518_02**

BOUS004

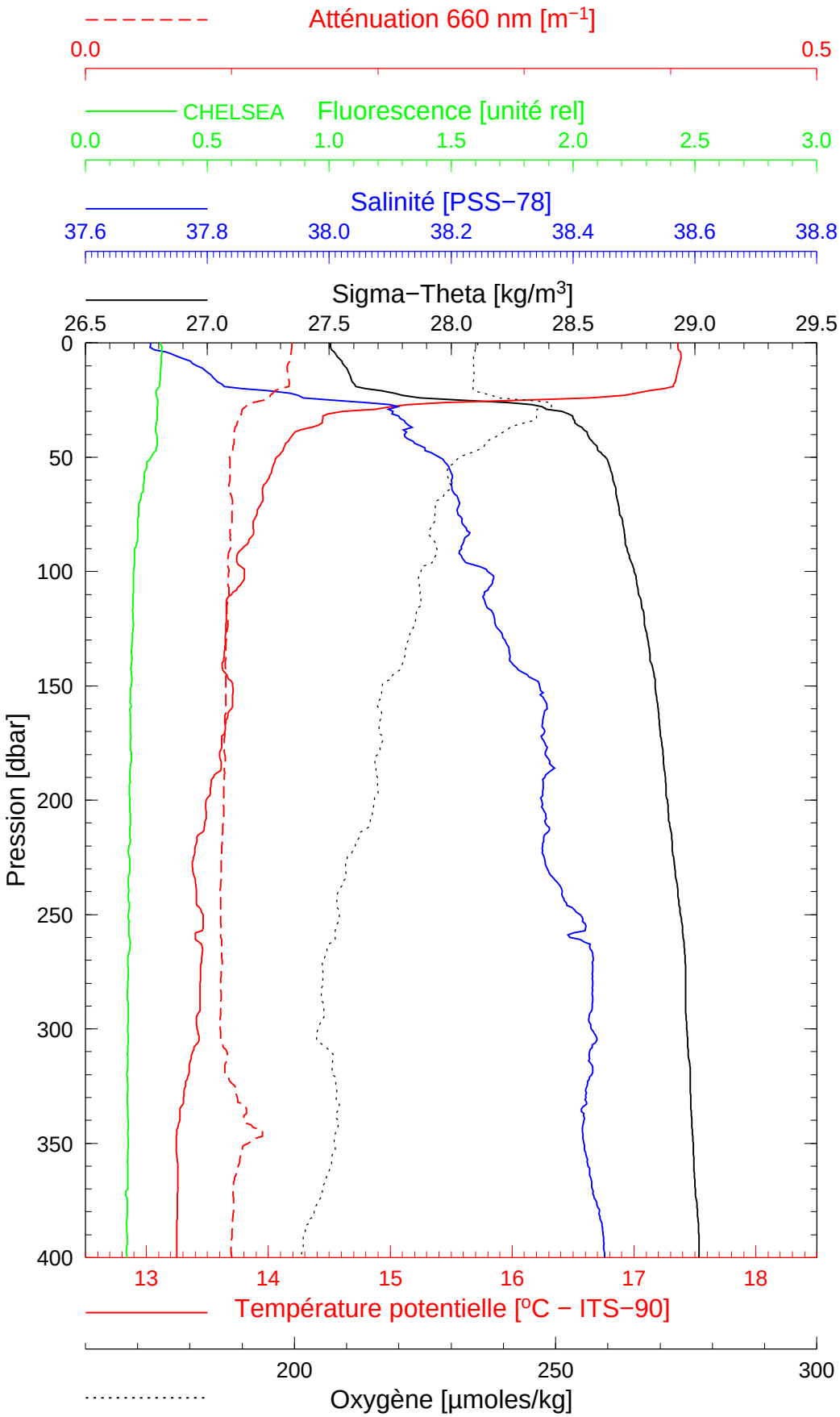


Date *18/05/2013* *Latitude* *43°37.105 N*

Heure déb *12h 42min [TU]* *Longitude* *07°24.699 E*

BOUSSOLE 135 **18/05/2013** **BOUS130518_03**

BOUS005



Date *18/05/2013* *Latitude* *43°39.028 N*

Heure déb *13h 33min [TU]* *Longitude* *07°20.959 E*