BOUSSOLE Monthly Cruise Report

Cruise 129
November 23 - 26, 2012

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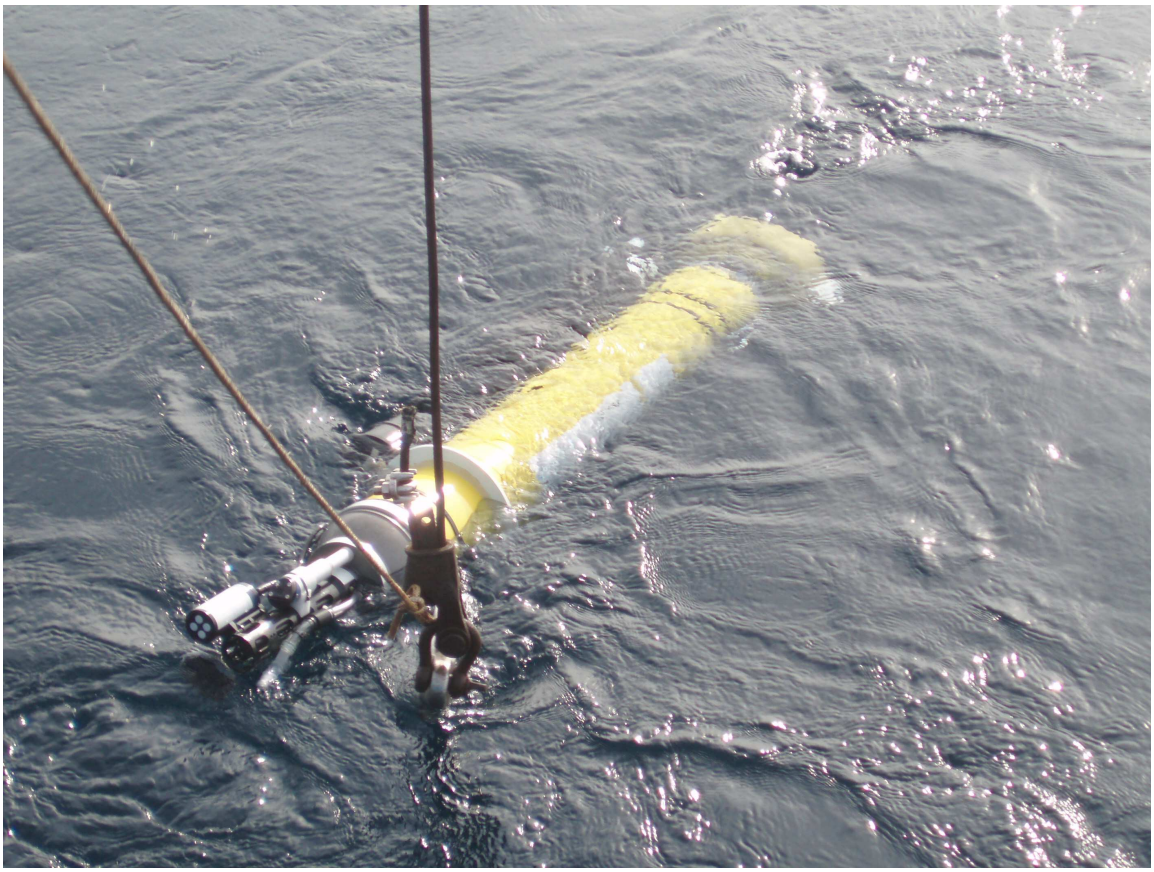

Deployment of a bio-optical profiling float at the BOUSSOLE site.

BOUSSOLE project

ESA/ESRIN contract N° 13226/10/I-NB

December 10, 2012

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

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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 The CDOM fluorometer, AC9 and Eco-BB3 have been withdrawn from the CTD package from March 2013.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).

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 second day, two bio-optical profiling float were deployed at the BOUSSOLE site for Emmanuel Boss studies, from *University of Maine*. Another profiling float with SUNA nitrate sensor was deployed by the *Laboratoire d'Océanographie de Villefranche-sur-mer* (LOV).
The second and the third day, deep CTD casts were performed at the BOUSSOLE site for the MOOSE DYFAMED program.

Cruise Summary

The first day was used for optical profiles, for a CTD cast with water sampling, for a Secchi disk at the BOUSSOLE site and for the CTD transect. The second day was used for CTD casts with water sampling, for optical profiles, for the deployments of the profiling floats and for a Secchi disk at the BOUSSOLE site. The third day was used for downloading data from the buoy, for CTD casts and for optical profiles at the BOUSSOLE site. The last day, bad weather prevented departure from the Nice harbour.

Friday 23 November 2012

This day, the sea state was smooth with a light breeze. Problems appeared with the connection of the CTD before its deployment, different tests had been performed, and then the CTD worked correctly. 3 C-OPS profiles, 1 CTD cast with water sampling and 1 Secchi disk were performed at the BOUSSOLE site. Then the CTD transect was completed.

Saturday 24 November 2012

This day, the sea state was smooth with a light breeze. A CTD cast with water sampling and 3 C-OPS profiles were performed at the BOUSSOLE site. Then, 2 bio-optical profiling floats and 1 profiling float with SUNA sensor were deployed. Then, a deep CTD cast was performed for the MOOSE DYFAMED program but unfortunately problems appeared on oxygen, conductivity and salinity data from 1300 m depth. A wireless CISCO connection was attempted but failed. Finally a Secchi disk was performed before returning to the Nice harbour.

Sunday 25 November 2012

The last day the sea state was smooth with a moderate breeze. A deep CTD cast for the MOOSE DYFAMED program was performed at the BOUSSOLE site. But they were the same problems on the data as the day before. A CISCO connection was attempted but failed. Then the surface sensors, solar panels, CISCO and ARGOS connectors were cleaned. A second CISCO connection was attempted and succeed. Data could be downloaded from the buoy. Then, a CTD cast with water sampling and 3 C-OPS profiles were performed at the BOUSSOLE site. The problem concerning oxygen, conductivity and salinity data still remained.

Monday 26 November 2012

Bad weather prevented the departure from the Nice harbour.

Cruise Report

Friday 23 November 2012 (UTC)

People on board: Emilie Diamond and Morvan Barnes.

0620 Departure from the Nice harbour.
0940 Arrival at the BOUSSOLE site.
0955 C-OPS 01, 02, 03.
1100 CTD tests.
1200 CTD 01, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC and a_p and TSM.
1240 Secchi 01, 24 m.
1245 Departure to the first transect station.
1315 CTD 02, 400 m, station 01 (43°25'N 07°48'E).
1415 CTD 03, 400 m, station 02 (43°28'N 07°42'E).
1510 CTD 04, 400 m, station 03 (43°31'N 07°37'E).
1605 CTD 05, 400 m, station 04 (43°34'N 07°31'E).
1700 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).
1815 Departure to the Nice harbour.
1850 Arrival at the Nice harbour.

Saturday 24 November 2012 (UTC)

People on board: Emilie Diamond, Grigor Obolensky and Orens Pasqueron de Fommervault.

0600 Departure from the Nice harbour.
0925 Arrival at the BOUSSOLE site.

0930 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 and TSM.
1005 C-OPS 04, 05, 06.
1100 Profiling floats deployments.
1200 CTD 09, 2300 m with water sampling for MOOSE DYFAMED programs.
1400 Attempt of CISCO connection with the buoy: failed.
1405 Secchi 02, 16 m.
1415 Departure to the Nice harbour.
1715 Arrival at the Nice harbour.

Sunday 25 November 2012 (UTC)

People on board: Emilie Diamond and Grigor Obolensky.

0605 Departure from the Nice harbour.
0930 Arrival at the Nice harbour.
0935 CTD 10, 1500 m for MOOSE DYFAMED program.
1000 Attempt of CISCO connection with the buoy: failed.
1030 Cleaning of surface sensors, solar panels, ARGOS and CISCO connectors on the top of the buoy.
1100 CISCO connection with the buoy and downloading data.
1225 CTD 11, 400 m with water sampling at 400, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC and a_p, CDOM, POC, Cytometry and TSM.
1300 C-OPS 07, 08, 09.
1400 Departure from the Nice harbour.
1700 Arrival at the Nice harbour.

Monday 26 November 2012 (UTC)

Bad weather prevented the departure from the Nice harbour.

Problems identified during the cruise

- The first day, problems appeared with the CTD connection. Different tests had been performed and then the CTD worked correctly.

- The second day, a lot of pieces of woods were observed on the surface of the sea, due to flood waters which occurred in Italy.

- The second day, during the CTD 09 cast (deep CTD cast for DYFAMED program), problems appeared with the oxygen, conductivity and salinity data. The third day, the same problems remained during the CTD 10 and CTD 11 cast from 300m depth.

- IOP profiles is not available for the CTD 09 and CTD 10: the IOP package was removed from the CTD Rosette frame in order to perform deep casts (IOP package could not be deployed under 400 m depth).

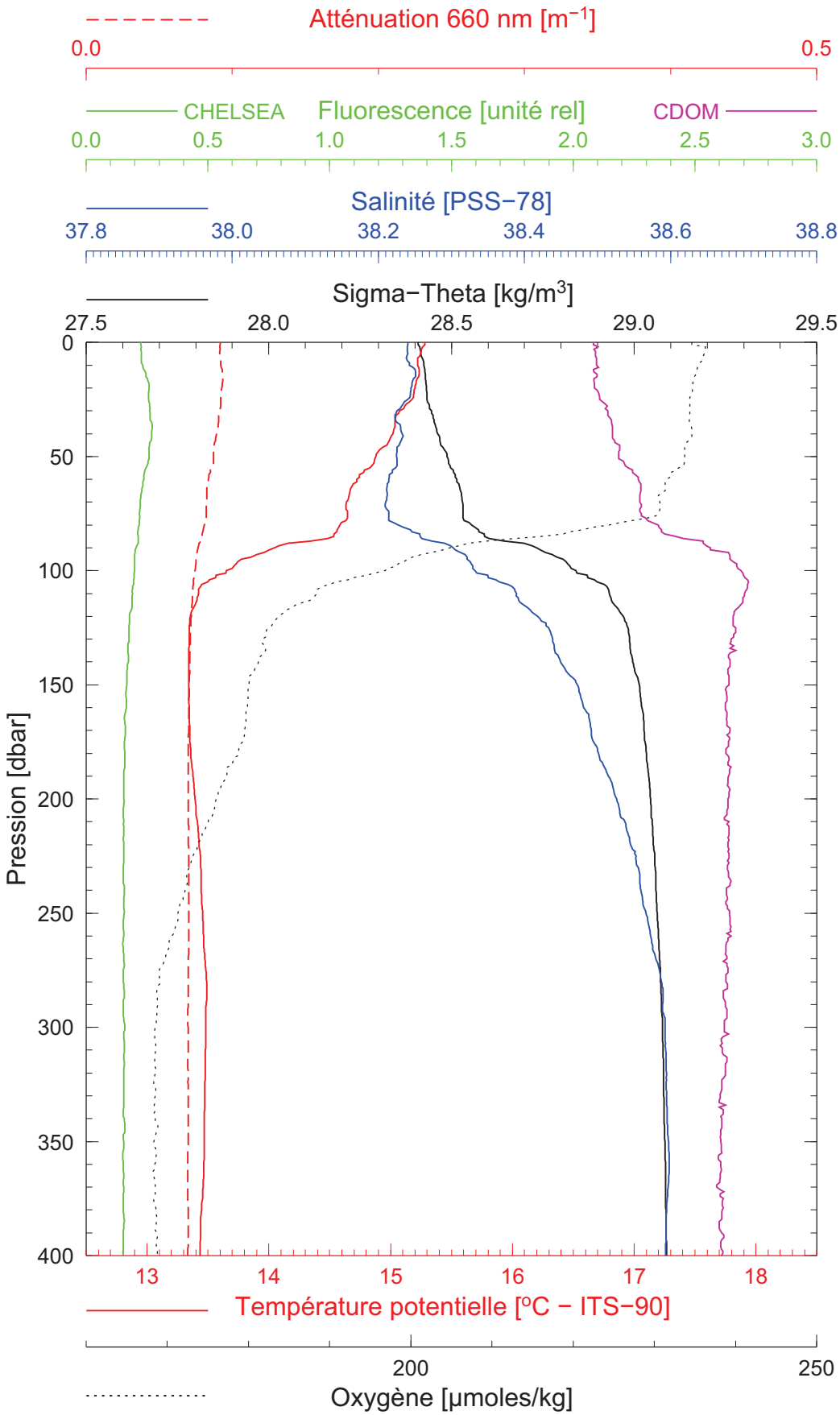
Appendices

Cruise Summary Table for Boussole 129

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
23/11/12		bou_c-ops_121123_0918_002_data.csv			09:57	4:35	111	43	22.204	7	53.792	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		bou_c-ops_121123_0918_003_data.csv			10:12	4:29	111	43	22.362	7	53.785	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		bou_c-ops_121123_0918_004_data.csv			10:28	4:20	106	43	22.472	7	53.656	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
			CTDBOUS001	HPLC, Ap & TSM	12:01	33:00	400	43	22.085	7	53.879	cloudy		3	4	120	1022.7	69		15.6	15.4	calm			
				Secchi01	12:40	4:00	24	43	22	7	54	cloudy		3								calm			
			CTDBOUS002		13:17	24:00	400	43	25.050	7	48.039	cloudy		3-4	2	101	1022.5	71		15.8	15.3	calm			
			CTDBOUS003		14:17	24:00	400	43	28.026	7	41.883	blue		3	5	308	1022.2	76		15.3	15.4	calm			
			CTDBOUS004		15:11	24:00	400	43	30.904	7	36.922	cloudy		4	7	297	1022.4	83		14.9	15.7	calm			
			CTDBOUS005		16:06	23:00	400	43	34.097	7	30.981	overcast		6	8	263	1022.2	83		14.7	17.1	calm			
			CTDBOUS006		17:00	23:00	400	43	36.942	7	24.900	night		9	3	329	1022.6	81		15.0	17.5	calm			
			CTDBOUS007		17:47	24:00	400	43	38.952	7	20.927	night		9	5	302	1022.7	80		14.8	17.5	calm			
24/11/12			CTDBOUS008	HPLC, Ap & TSM	09:30	34:00	400	43	22.362	7	54.179	overcast		8	5	250	1024.0	81		17.5	14.6	calm			
		bou_c-ops_121124_1004_002_data.csv			10:19	4:32	110	43	21.961	7	53.847	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		bou_c-ops_121124_1004_003_data.csv			10:34	4:35	112	43	21.971	7	53.694	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		bou_c-ops_121124_1004_004_data.csv			10:50	3:36	85	43	21.885	7	53.528	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
			CTDBOUS009		11:57	1:23:00	2300	43	21.899	7	53.153	overcast		7	4	221	1023.2	86		16.5	15.0	calm			
				Secchi02	12:40	4:00	16	43	22	7	54	overcast		7								calm			
25/11/12			CTDBOUS010		09:37	45:00	1500	43	22.213	7	53.478	cloudy		4-5	6	111	1021.9	89		16.3	15.1	calm			
			CTDBOUS011	HPLC, Ap, TSM, CDOM, POC & Cyto	12:28	36:00	400	43	22.450	7	54.496	overcast		7	13	145	1020.5	89		16.2	15.0	calm			
		bou_c-ops_121125_1306_002_data.csv			13:19	3:25	81	43	22.246	7	54.293	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		bou_c-ops_121125_1306_003_data.csv			13:27	3:35	84	43	21.971	7	53.694	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		bou_c-ops_121125_1306_004_data.csv			13:35	3:33	85	43	22.564	7	54.424	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
26/11/12	Bad weather																								

BOUSSOLE 129 **23/11/2012** **BOUS121123_01**

BOUS001

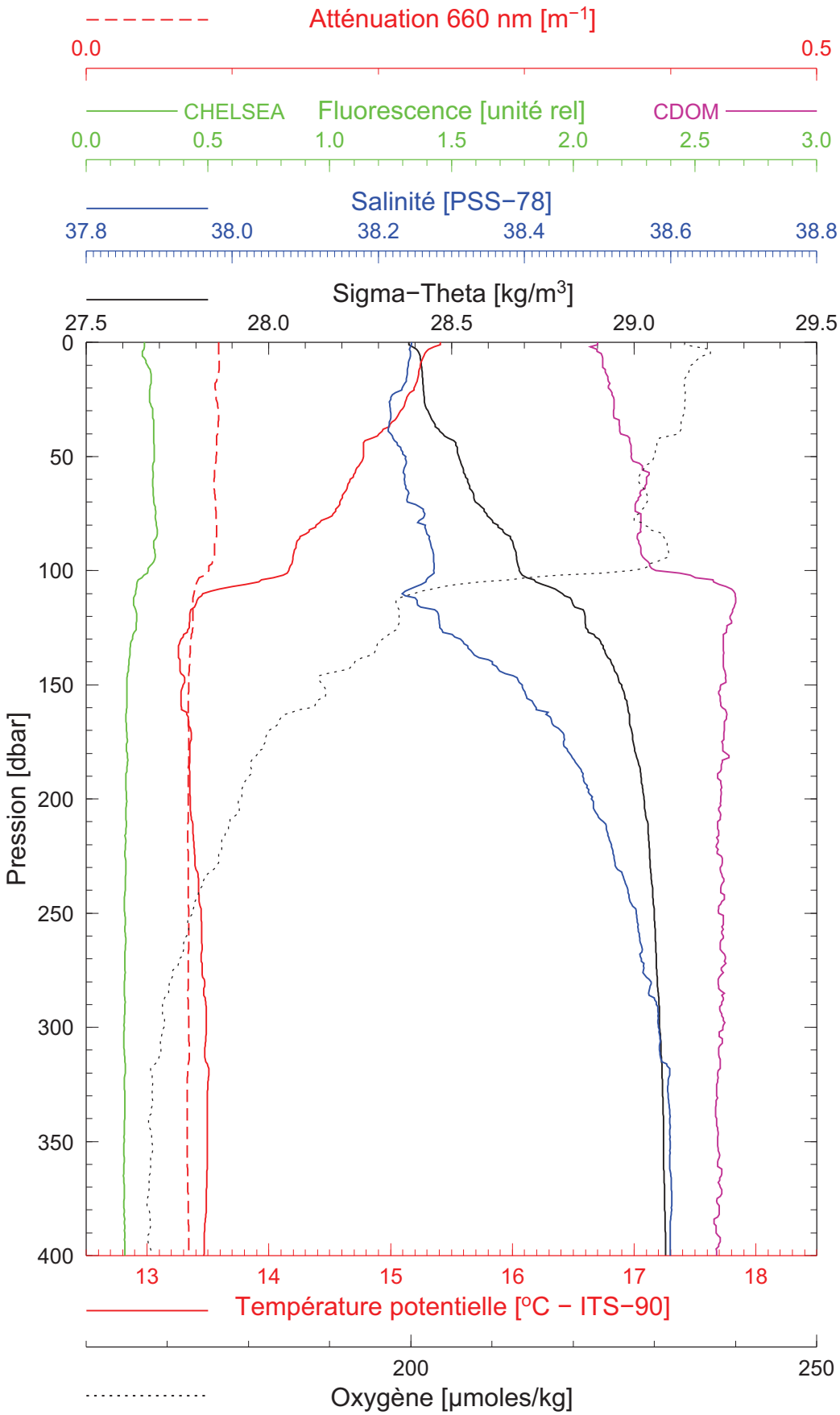


Date *23/11/2012* *Latitude* *43°22.085 N*

Heure déb *12h 01min [TU]* *Longitude* *07°53.878 E*

BOUSSOLE 129 **23/11/2012** **BOUS121123_02**

BOUS002



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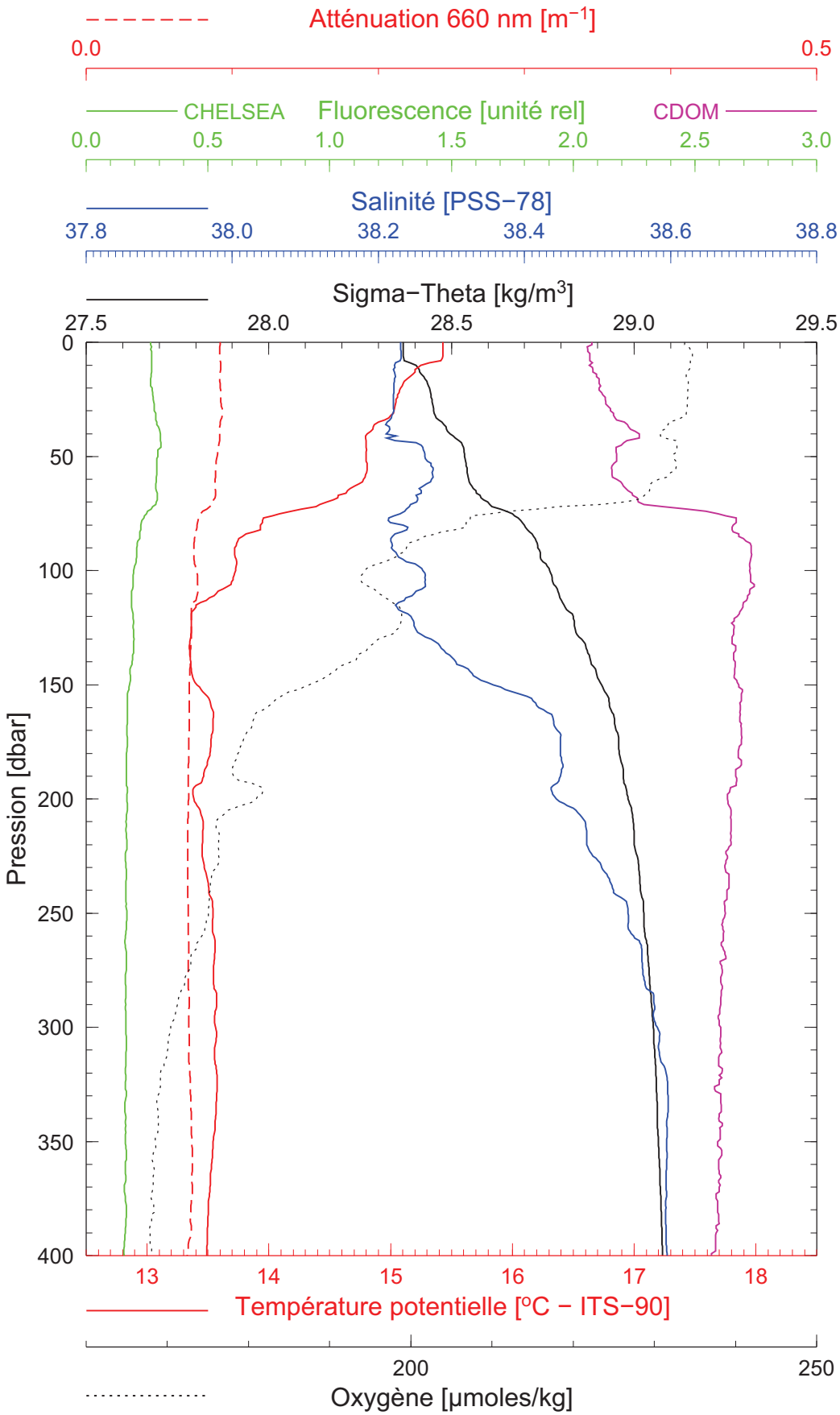
BOUSSOLE 129 **23/11/2012** **BOUS121123_03**

BOUS003

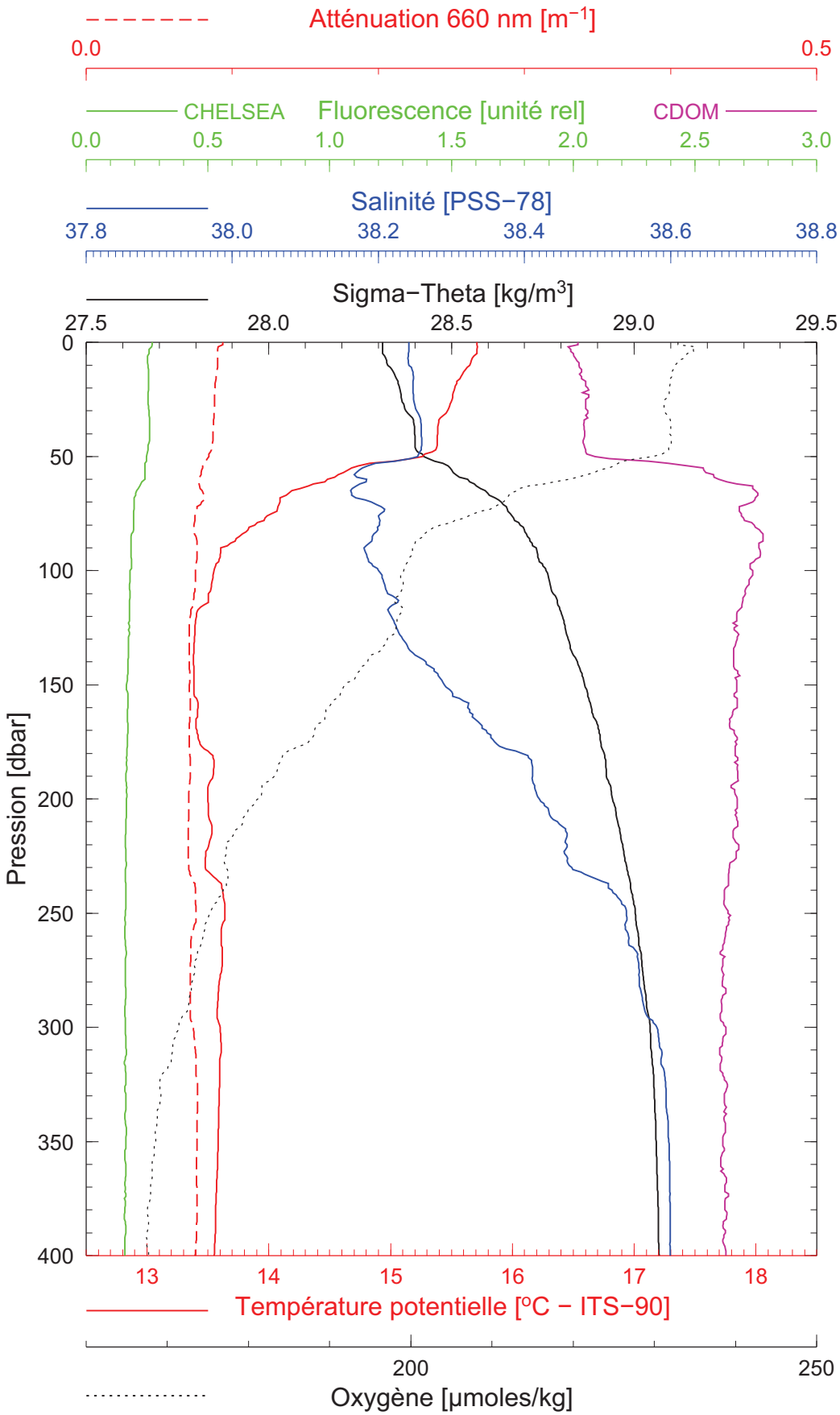


Date *23/11/2012* *Latitude* *43°28.026 N*

Heure déb *14h 17min [TU]* *Longitude* *07°41.883 E*

BOUSSOLE 129 **23/11/2012** **BOUS121123_04**

BOUS004



Date *23/11/2012* *Latitude* *43°30.904 N*

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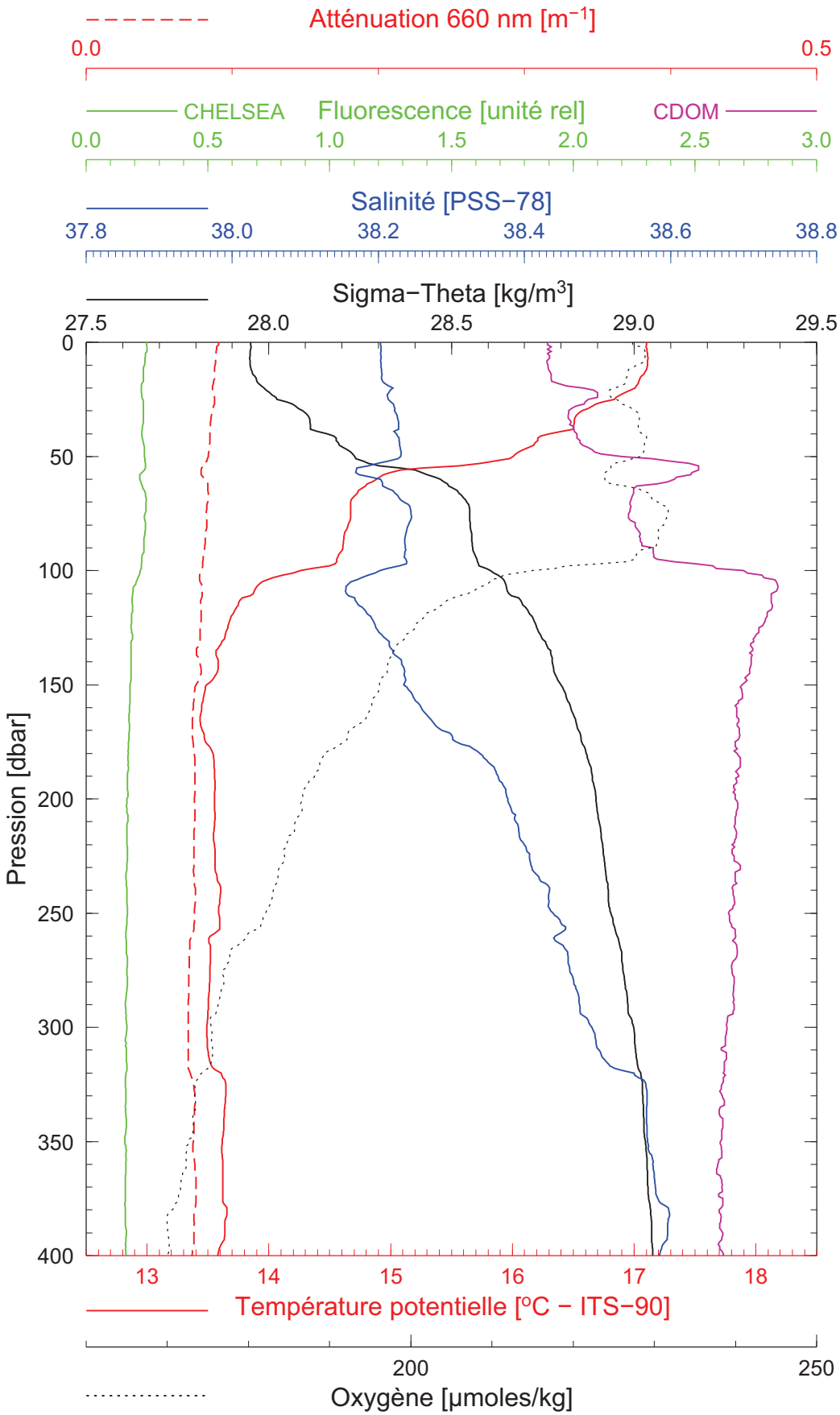
BOUSSOLE 129 **23/11/2012** **BOUS121123_05**

BOUS005



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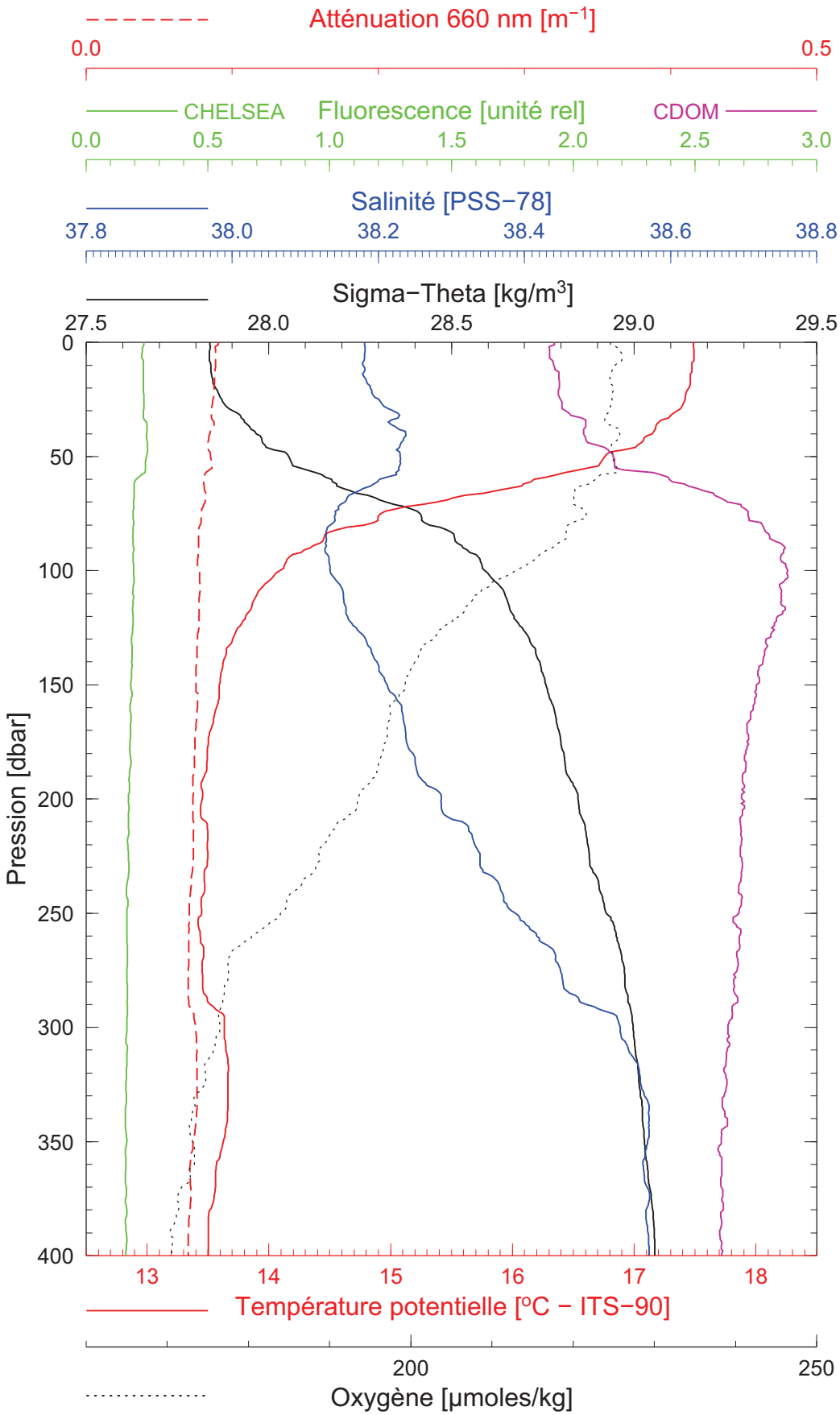
Heure déb *16h 06min [TU]* *Longitude* *07°30.981 E*

BOUSSOLE 129 **23/11/2012** **BOUS121123_06**

BOUS006



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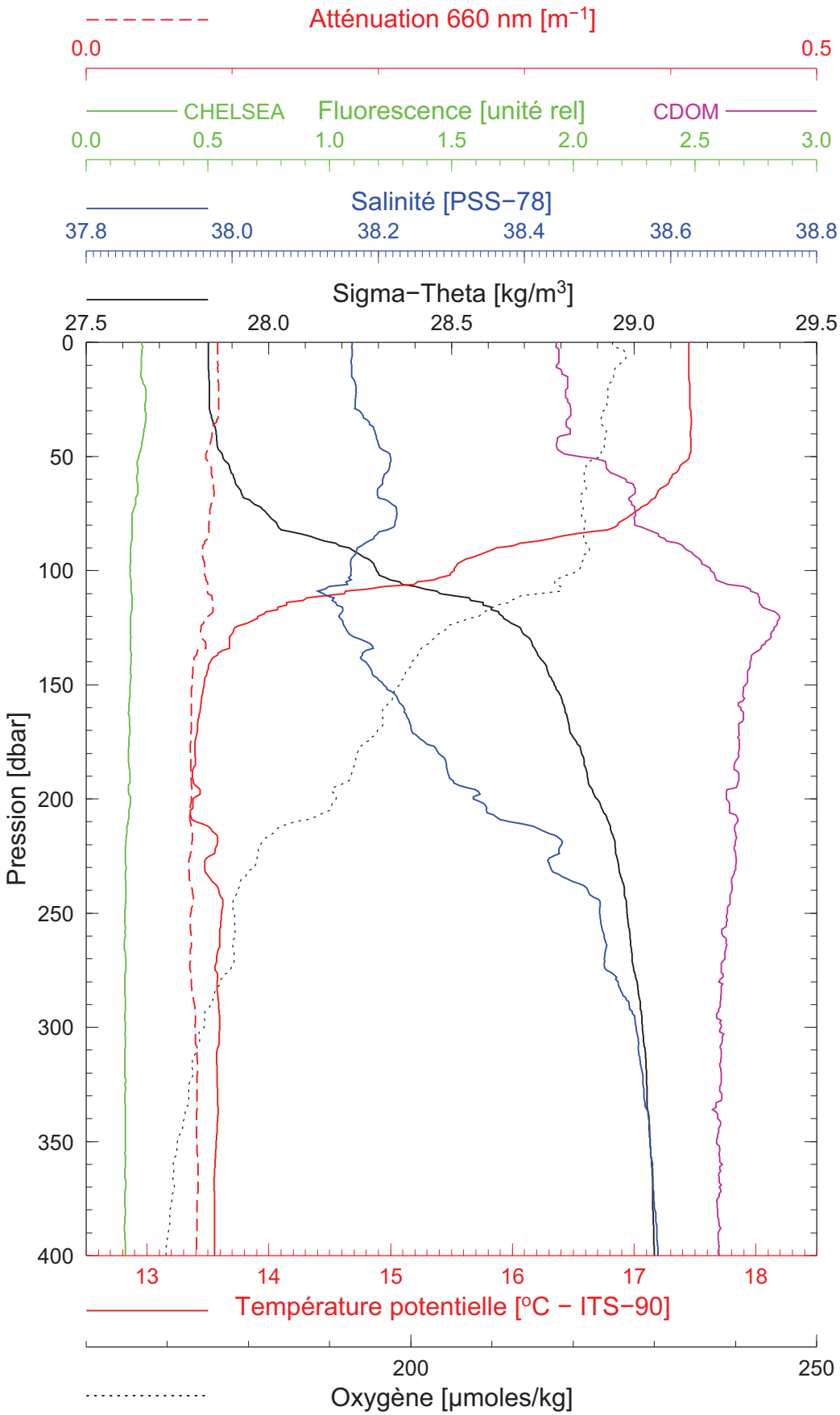
Heure déb *17h 00min [TU]* *Longitude* *07°24.900 E*

BOUSSOLE 129 **23/11/2012** **BOUS121123_07**

BOUS007

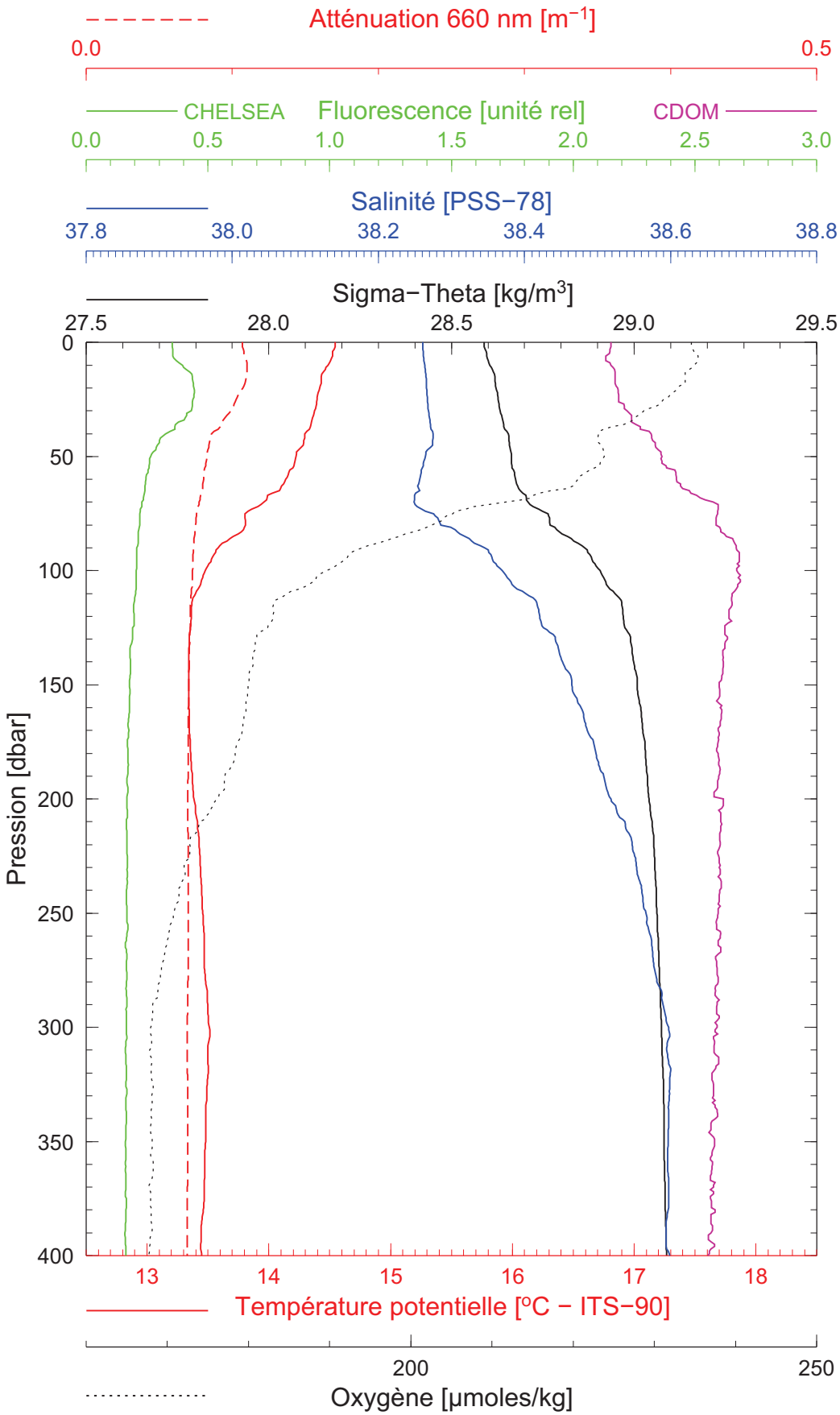


Date *23/11/2012* *Latitude* *43°38.952 N*

Heure déb *17h 47min [TU]* *Longitude* *07°20.927 E*

BOUSSOLE 129 **24/11/2012** **BOUS121124_01**

BOUS008



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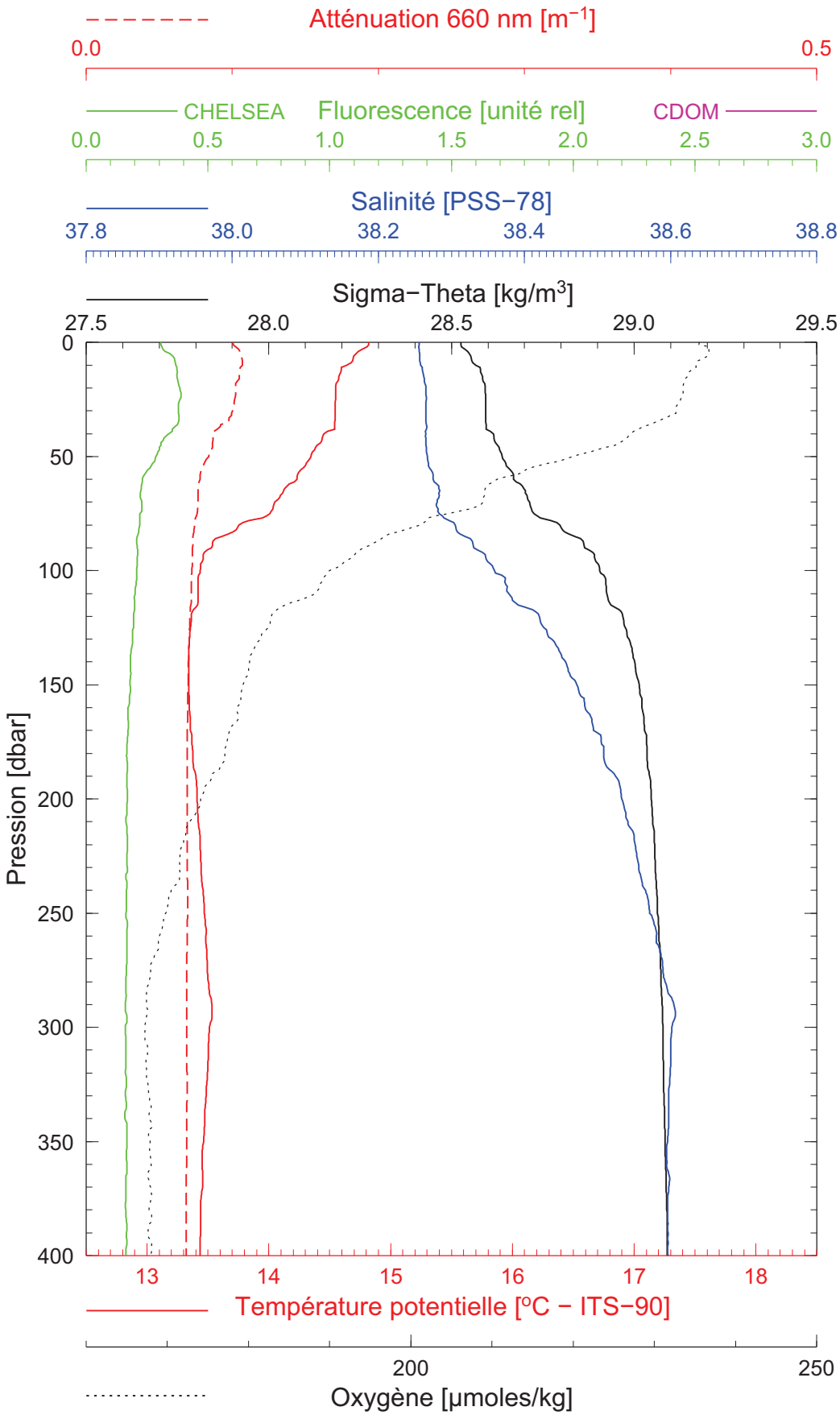
BOUSSOLE 129 **24/11/2012** **BOUS121124_02**

BOUS009



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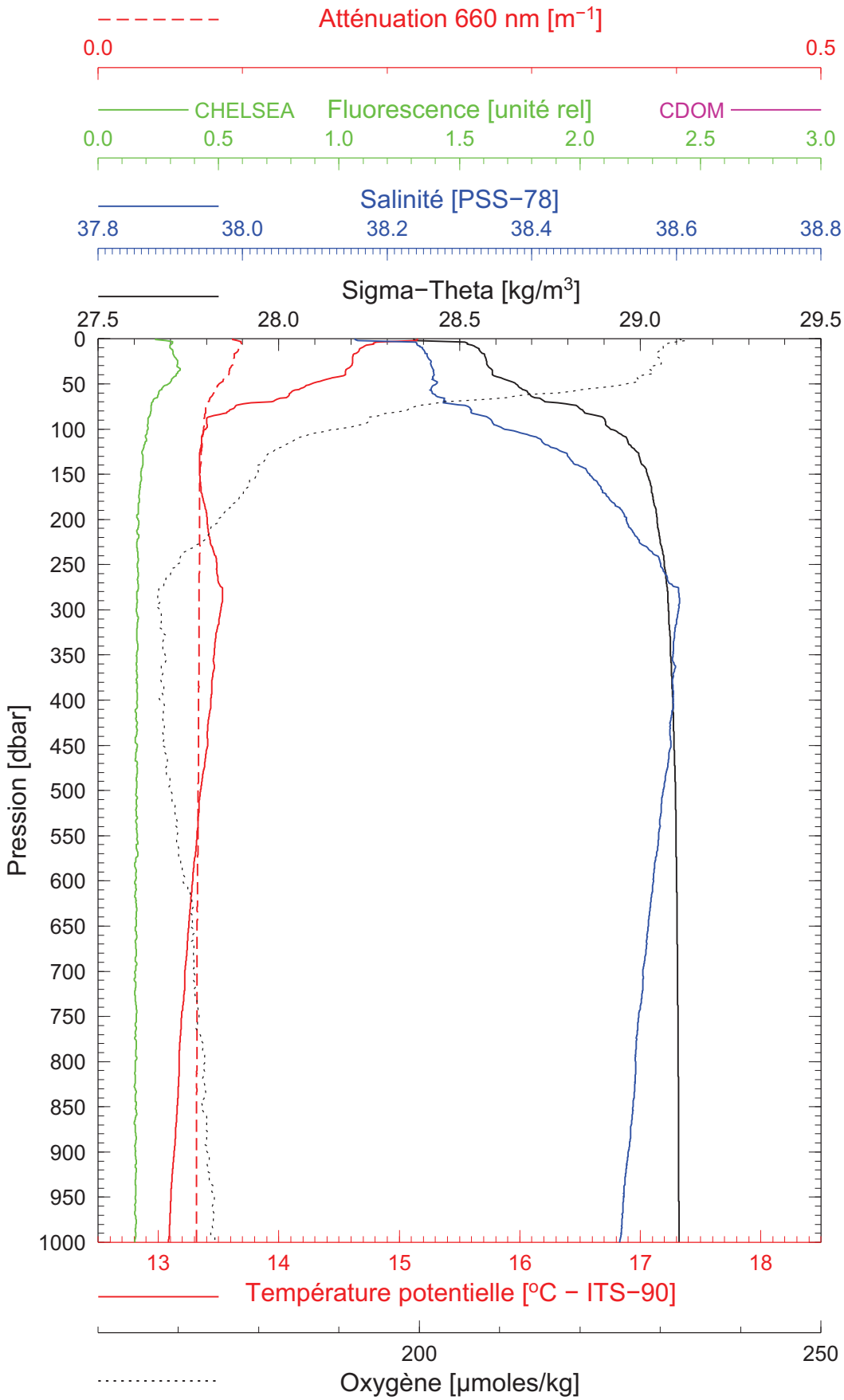
Heure déb *11h 57min [TU]* *Longitude* *07°53.153 E*

BOUSSOLE 129 **25/11/2012** **BOUS121125_01**

BOUS010



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BOUSSOLE 129 **25/11/2012** **BOUS121125_02**

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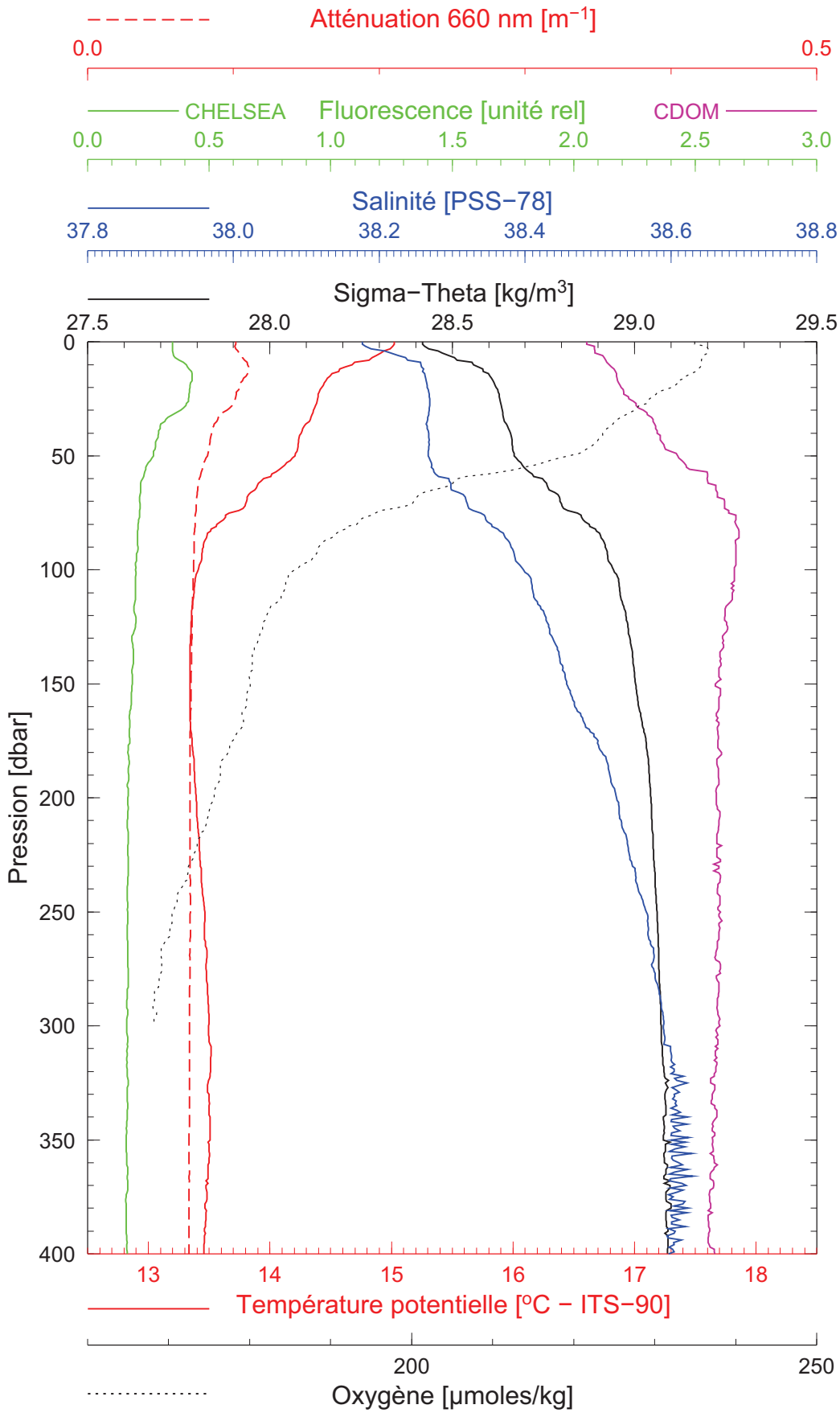

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