BOUSSOLE Monthly Cruise Report

Cruise 136
June 08 - 10, 2013

Duty Chief: Melek Golbol (golbol@obs-vlfr.fr)
Vessel: R/V Téthys II
(Captain: Renaud Le Bourhis)

Science Personnel: Agnieszka Bialek, Emilie Diamond, Melek Golbol, Claire Greenwell, Yves Lamblard, David Luquet, Loris Martini, Vincent Taillandier and Vincenzo Vellucci.

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

The BOUSSOLE buoy radiometers set measuring *Ed, Eu* and *Lu* at 4m depth, colonized by caprellid amphipods (*crustacea*) before cleaning.

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).

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

During this cruise, the divers removed from the buoy one of the two underwater Argos beacon (serial number # 5433). This beacon will be installed on the new buoy before the deployment planned in June 2013.

Cruise Summary

The first day was used for diving operations, a CTD cast with water sampling at the BOUSSOLE site, optical profiles and 1 Secchi disk. The second day was used for optical profiles, a CTD cast with water sampling at the BOUSSOLE site and the CTD transect. The last day was used for optical profiles, 1 Secchi disk and a CTD cast with water sampling at the BOUSSOLE site.

Saturday 08 June 2013

This day the sea state was calm with a light breeze during the morning and the sea state was smooth during the afternoon. The sky was overcast and the visibility was medium. When arrived at the BOUSSOLE site, divers went at sea to clean the underwater sensors and perform dark measurements. They dismounted the Argos sensor. In the meantime, a direct connection was got. Then, 1 CTD cast with water sampling, optical profiles and 1 Secchi disk were performed.

Sunday 09 June 2013

The second day, the sea state was calm with a light breeze during the morning and the sea state was calm with a light air during the afternoon. The sky was overcast and the visibility was medium. Optical profiles, 1 CTD cast with water sampling and 1 Secchi disk were performed at the BOUSSOLE site. Then the CTD transect was performed.

Monday 10 June 2013

The last day, the sea state was smooth with a gentle breeze. The sky was blue and the visibility was good. Optical profiles, 1 Secchi disk and 1 CTD cast with water sampling were performed at the BOUSSOLE site.

Cruise Report

Saturday 08 June 2013 (UTC)

People on board: Agnieszka Bialek, Emilie Diamond, Melek Golbol, Claire Greenwell, Vincenzo Velluci, and 3 divers.

0530 Departure from the Nice harbour.
0850 Arrival at the BOUSSOLE site.
09:00 Direct connection from the buoy.
0910 Diving on the buoy for cleaning instruments and dark measurements.
Divers dismounted the Argos beacon.
0920 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, TSM.
1000 Lunch.
1110 C-OPS 01, 02, 03, 04.
1225 C-OPS 05, 06, 07.
1300 Secchi disk 01 (19 m).
1315 Departure to the Nice harbour.
1630 Arrival at the Nice harbour.

Sunday 09 June 2013 (UTC)

People on board: Agnieszka Bialek, Emilie Diamond, Melek Golbol, Claire Greenwell, Vincent Taillandier and Vincenzo Velluci.

0505 Departure from the Nice harbour.
0830 Arrival at the BOUSSOLE site.
0835 C-OPS 08, 09, 10.
1010 CTD 02, 400 m with water sampling at 400, 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p, TSM, POC and Cytometry.
1105 Secchi disk 02 (20 m).
1115 Departure to the first transect station.
1215 CTD 03, 400 m, station 01 (43°25’N 07°48’E).
1315 CTD 04, 400 m, station 02 (43°28’N 07°42’E).
1405 CTD 05, 400 m, station 03 (43°31’N 07°37’E).
1505 CTD 06, 400 m, station 04 (43°34’N 07°31’E).
1610 CTD 07, 400 m, station 05 (43°37’N 07°25’E).
1710 Dark HS6, 100m.
CTD 08, 400 m, station 06 (43°39’N 07°21’E).
1740 Departure to the Nice harbour.
1800 Arrival at the Nice harbour.

Saturday 10 June 2013 (UTC)

People on board: Emilie Diamond, Melek Golbol and Vincent Taillandier.

0500 Departure from the Nice harbour.
0815 Arrival at the BOUSSOLE site.
0820 C-OPS 11, 12, 13.
0915 Secchi disk 03 (25 m).
0920 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, TSM.
1000 Departure to the Nice harbour.
1310 Arrival at the Nice harbour.

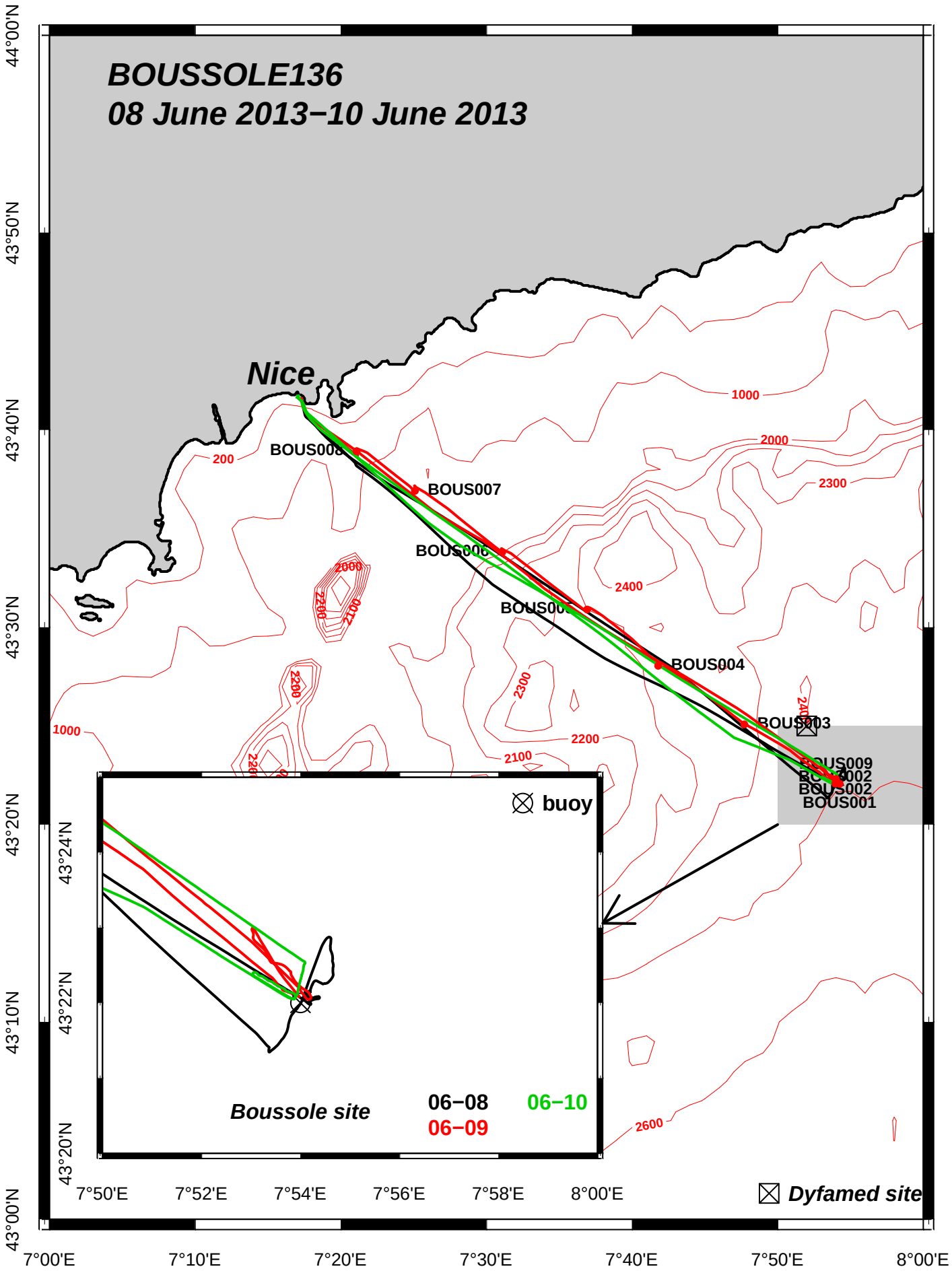
Problems identified during the cruise

- Data were retrieved with a direct connection with the buoy but the downloading was very long (over 1h), probably because of a corrupted file.

Appendices

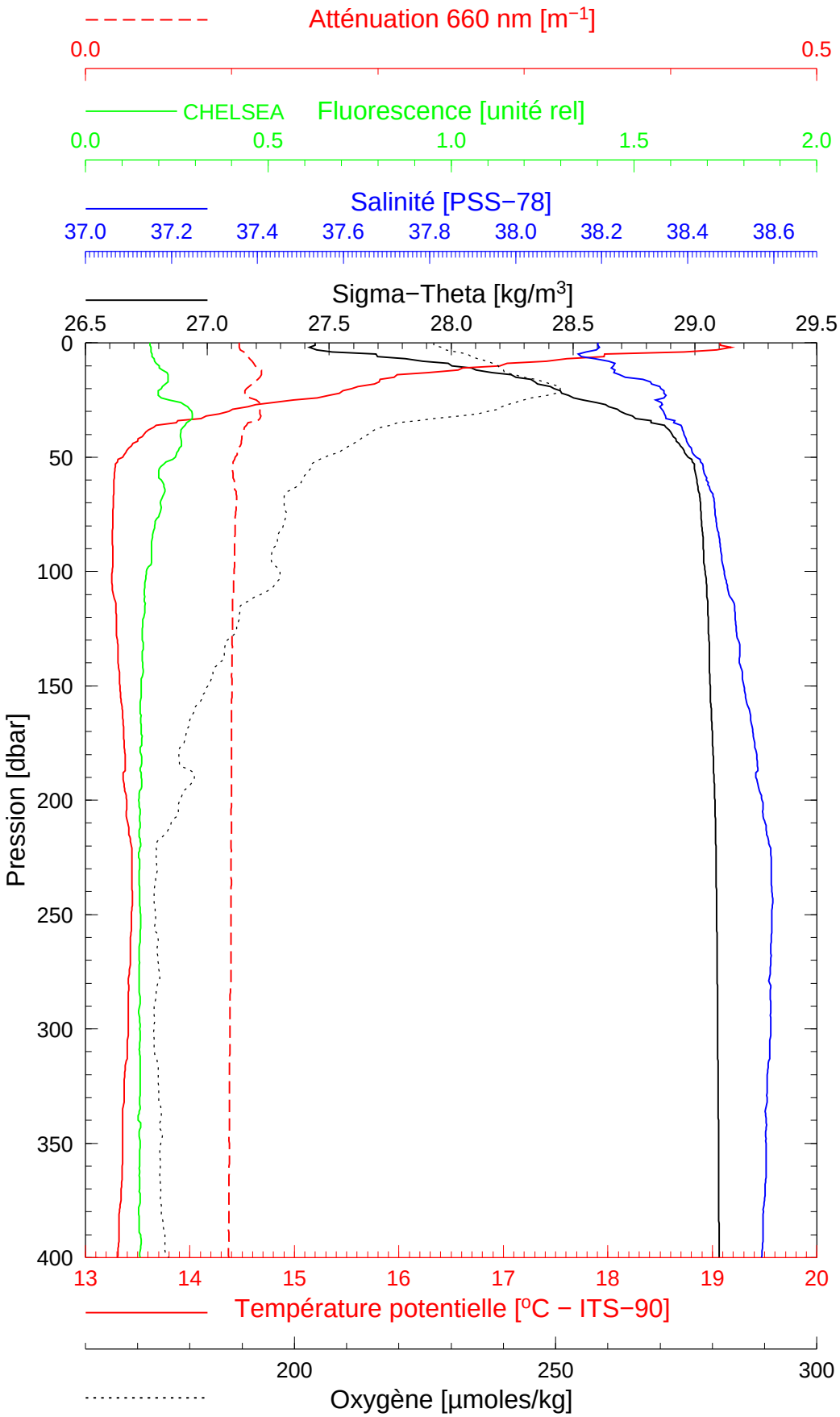
Cruise Summary Table for Boussole 136

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
			CTDBOUS001	HPLC, Ap, TSM	9:20	30:00	400	43	22.068	7	54.263	overcast		8	4	111	1017.2	86		19.2	18.6	calm			
	bou_c-ops_130608_0844_001_data.csv				11:10	1:25																		
		bou_c-ops_130608_0844_003_data.csv			11:39	3:47	87.8	43	22.321	7	54.627	overcast	Ns&As	8	16	256	1017.0	87	medium	19.0		calm	0.5		few
		bou_c-ops_130608_0844_004_data.csv			11:51	3:22	80.0	43	22.547	7	54.647	overcast	Ns&As	8	16	256	1017.0	87	medium	19.0		calm	0.5		few
08/06/13		bou_c-ops_130608_0844_006_data.csv			12:25	4:03	96	43	21.877	7	53.873	overcast	Ns&As	8	5	292	1015.7	87	medium	18.9		calm	0.5		no
		bou_c-ops_130608_0844_007_data.csv			12:37	3:46	90.7	43	21.684	7	53.742	overcast	Ns&As	8	5	292	1015.7	87	medium	18.9		calm	0.5		no
		bou_c-ops_130608_0844_008_data.csv			12:48	3:10	74.4	43	21.484	7	53.595	overcast	Ns&As	8	5	292	1015.7	87	medium	18.9		calm	0.5		no
	bou_c-ops_130608_0844_012_data.csv				13:11	1:26																		
				Secchi01	13:00	4:00	19	43	22	7	54	overcast		8					medium			calm			
	bou_c-ops_130609_0833_001_data.csv				08:39	1:25																		
		bou_c-ops_130609_0833_004_data.csv			08:58	4:11	102.1	43	22.348	7	53.832	overcast	As	8	5	107	1011.2	74	medium	19.3		calm	0.2		no
		bou_c-ops_130609_0833_006_data.csv			09:19	3:24	82.4	43	22.524	7	53.490	overcast	As	8	5	107	1011.2	74	medium	19.3		calm	0.2		no
		bou_c-ops_130609_0833_007_data.csv			09:41	3:21	80.0	43	22.806	7	53.102	overcast	As	8	5	107	1011.2	74	medium	19.3		calm	0.2		no
			CTDBOUS002	HPLC, Ap, TSM, CDOM, POC & cyto	10:10	47:00	400	43	22.088	7	53.963	overcast		7	2	110	1011.2	74		19.4	19.1	calm			
09/06/13				Secchi02	11:05	4:00	20	43	22	7	54	overcast		6					medium			calm			
			CTDBOUS003		12:17	22:00	400	43	25.079	7	47.710	overcast		6	9	131	1010.3	68		19.6	19.5	calm			
			CTDBOUS004		13:14	23:00	400.0	43	28.047	7	41.797	overcast		7	9	119	1010.0	68		19.5	19.7	calm			
			CTDBOUS005		14:07	22:00	400.0	43	30.900	7	36.915	overcast	stormy	8	25	109	1010.7	80		15.4	19.3	calm			
			CTDBOUS006		15:06	24:00	400.0	43	33.811	7	31.095	overcast		6	14	293	1010.5	76		15.8	19.3	calm			
			CTDBOUS007		16:10	26:00	400.0	43	36.994	7	25.095	overcast		6	6	221	1010.5	55		18.7	19.3	calm			
			CTDBOUS008		17:14	20:00	400.0	43	38.920	7	21.089	overcast	cloudy	5	12	115	1010.2	54		17.7	19.4	calm			
	bou_c-ops_130610_0748_001_data.csv				07:53	1:21																		
		bou_c-ops_130610_0748_002_data.csv			08:26	4:34	109.4	43	22.147	7	53.762	blue	S&As	1	7	244	1011.1	76	good	17.9		calm	0.5		no
		bou_c-ops_130610_0748_003_data.csv			08:38	4:33	109.9	43	22.221	7	53.542	blue	S&As	1	7	244	1011.1	76	good	17.9		calm	0.5		no
10/06/13		bou_c-ops_130610_0748_004_data.csv			08:50	3:51	93.0	43	22.295	7	53.354	blue	S&As	1	7	244	1011.1	76	good	17.9		calm	0.5		no
	bou_c-ops_130610_0923_001_data.csv				09:25	1:37																		
				Secchi03	09:15	4:00	25	43	22	7	54	blue		3					good			calm			
			CTDBOUS009	HPLC, Ap, TSM	9:22	34:00	400	43	22.315	7	54.006	blue		3	8	119	1011.4	78		18.0	18.7	calm			


BOUSSOLE136
08 June 2013−10 June 2013
Nice
BOUS008
BOUS007
BOUS006
BOUS005
BOUS004
BOUS003
BOUS009
BOUS002
BOUS001
200
1000
2000
2300
2400
2100
2200
2600
buoy
Boussole site
06−08
06−09
06−10
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 136 **08/06/2013** **BOUS130608_01**

BOUS001

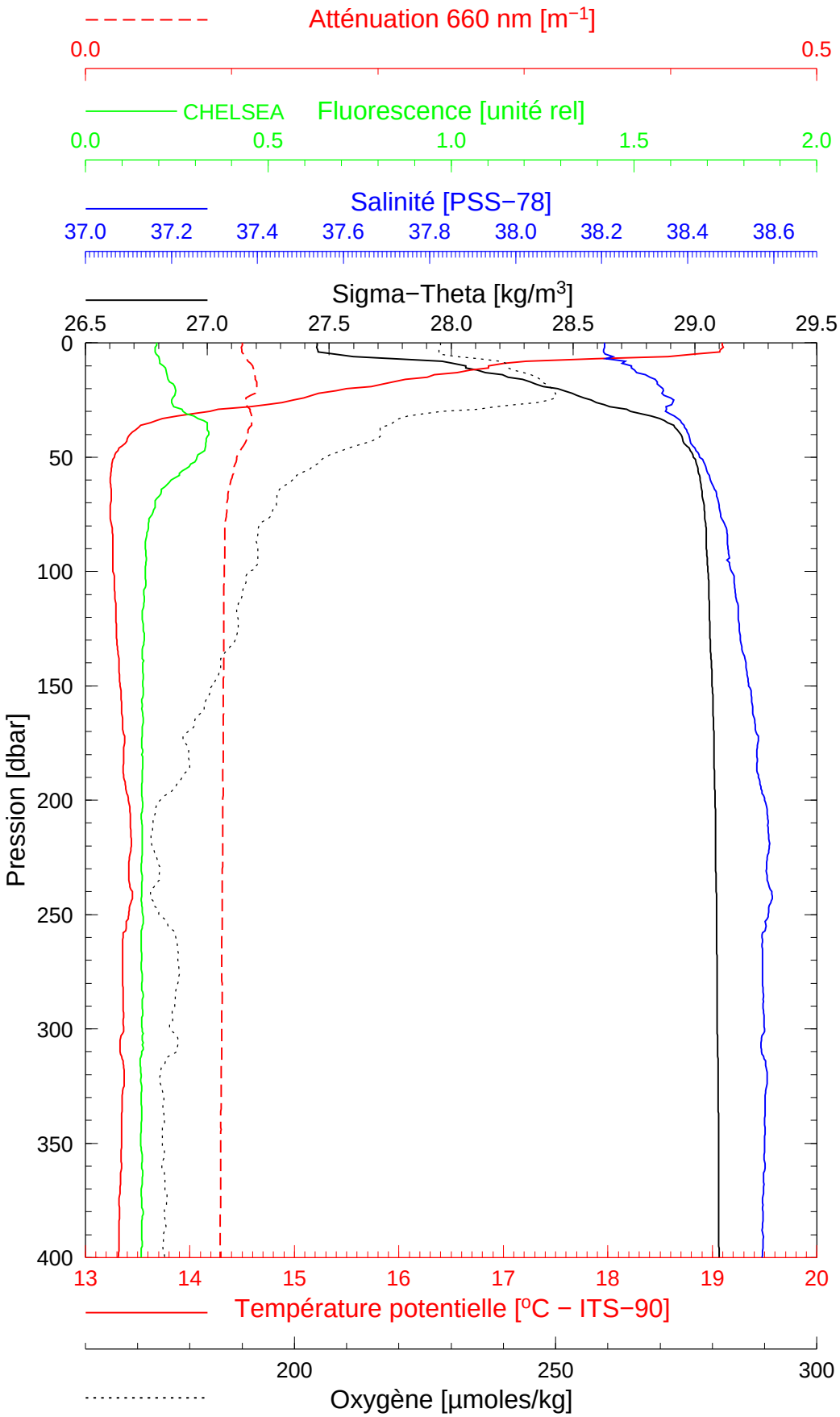


Date *08/06/2013* *Latitude* *43°22.068 N*

Heure déb *09h 20min [TU]* *Longitude* *07°54.263 E*

BOUSSOLE 136 **09/06/2013** **BOUS130608_02**

BOUS002

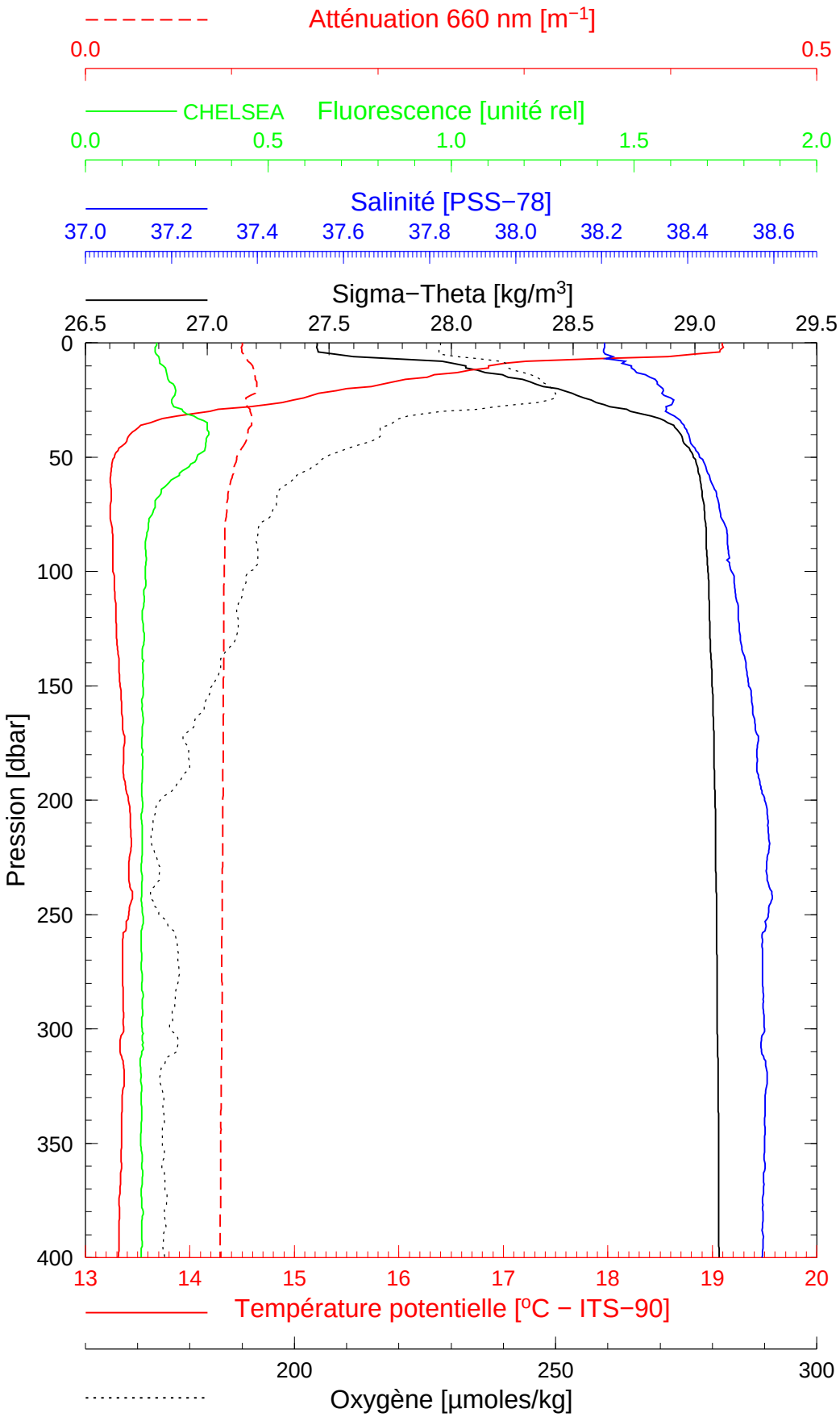


Date *09/06/2013* *Latitude* *43°22.088 N*

Heure déb *10h 10min [TU]* *Longitude* *07°53.963 E*

BOUSSOLE 136 **09/06/2013** **BOUS130609_01**

BOUS002

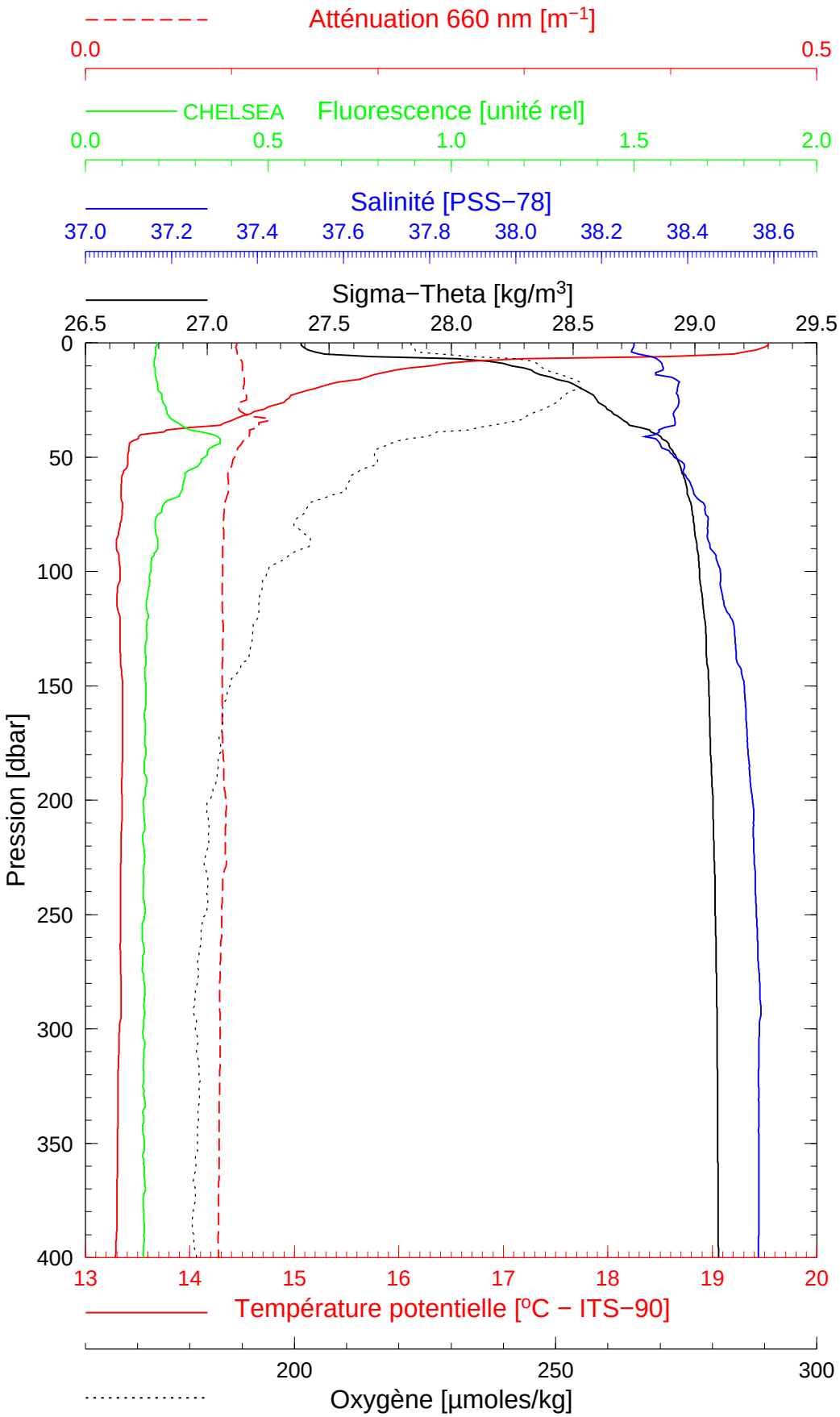


Date *09/06/2013* *Latitude* *43°22.088 N*

Heure déb *10h 10min [TU]* *Longitude* *07°53.963 E*

BOUSSOLE 136 **09/06/2013** **BOUS130609_02**

BOUS003

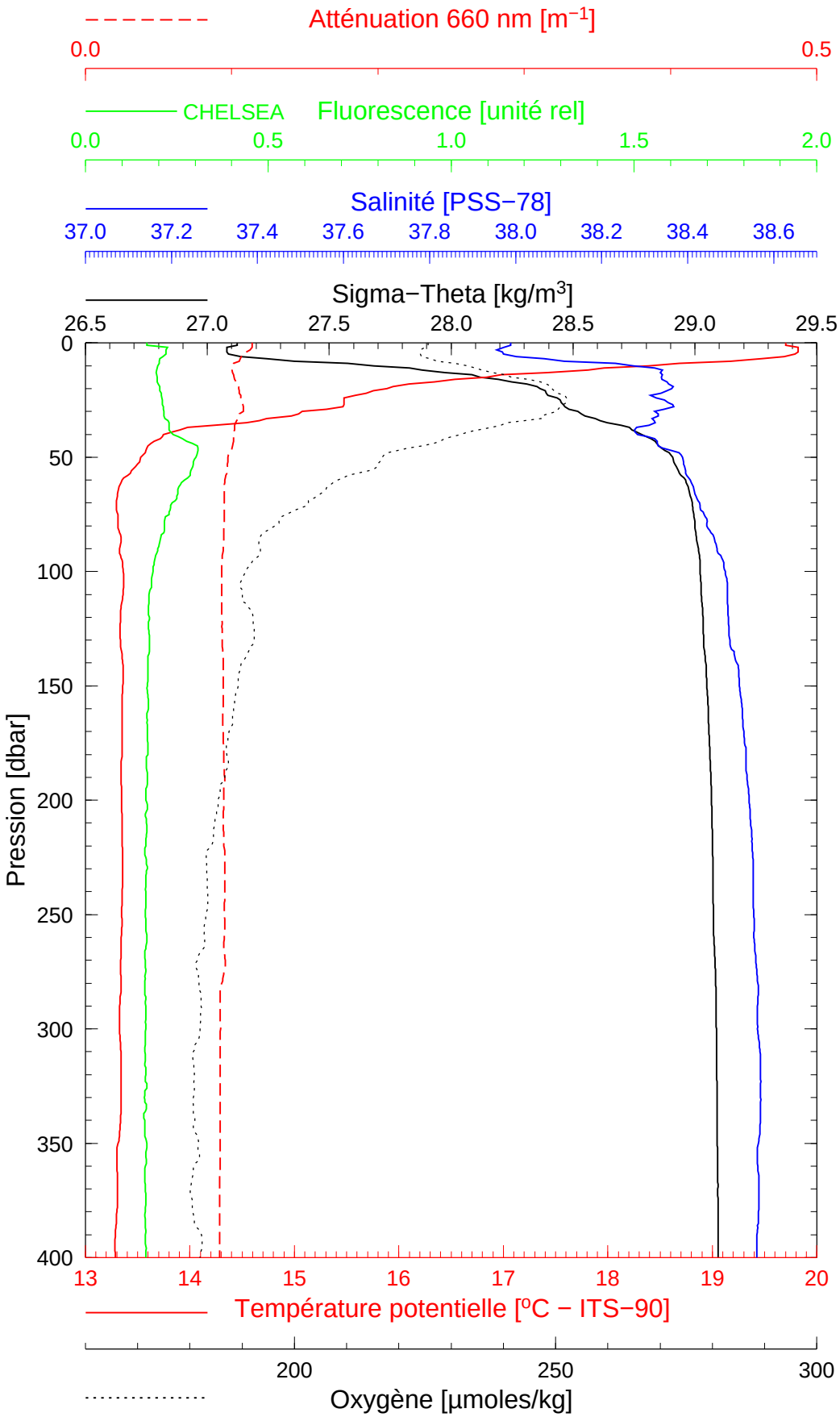


Date *09/06/2013* *Latitude* *43°25.079 N*

Heure déb *12h 17min [TU]* *Longitude* *07°47.710 E*

BOUSSOLE 136 **09/06/2013** **BOUS130609_03**

BOUS004



Date *09/06/2013* *Latitude* *43°28.047 N*

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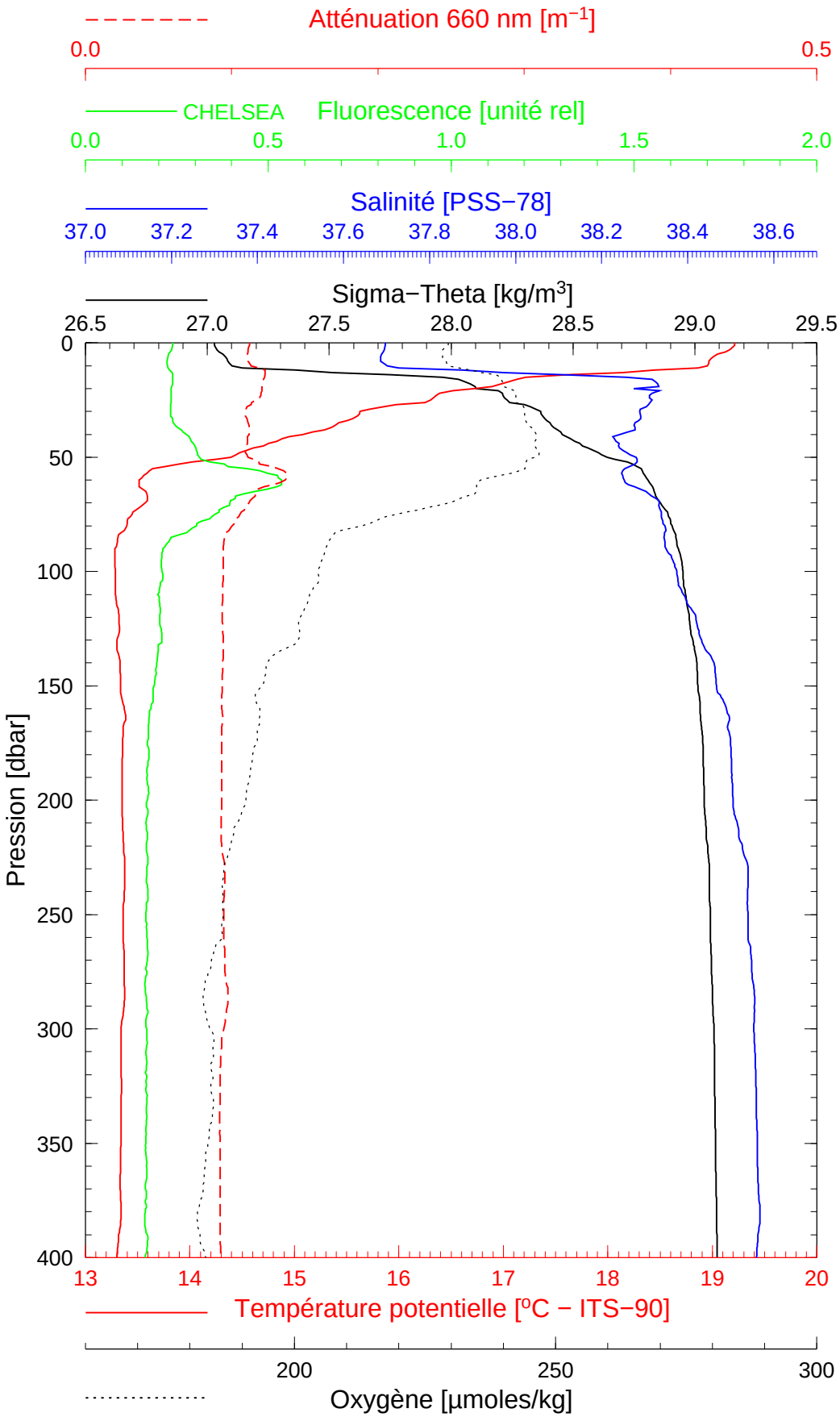
BOUSSOLE 136 **09/06/2013** **BOUS130609_04**

BOUS005

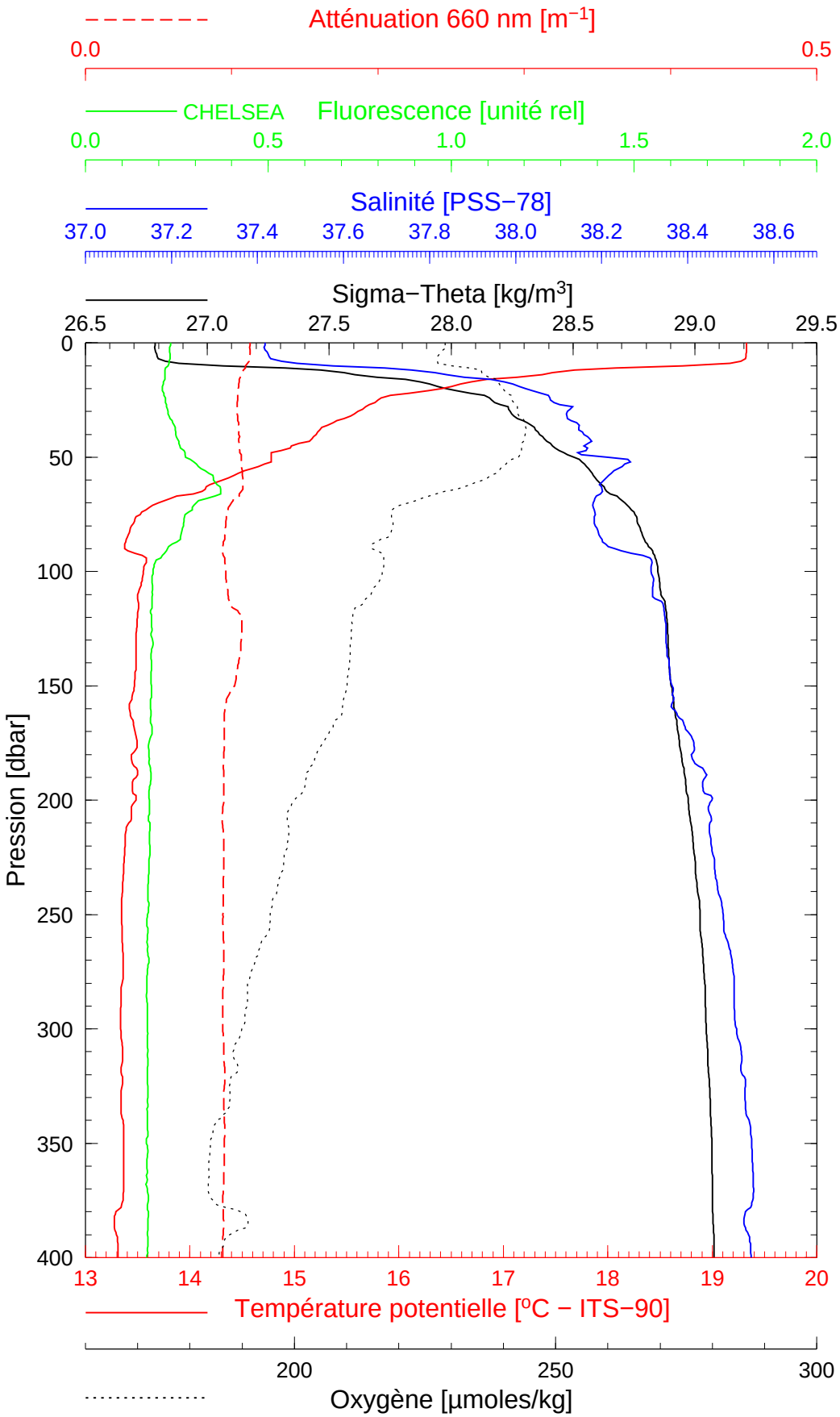


Date *09/06/2013* *Latitude* *43°30.900 N*

Heure déb *14h 07min [TU]* *Longitude* *07°36.915 E*

BOUSSOLE 136 **09/06/2013** **BOUS130609_05**

BOUS006



Date *09/06/2013* *Latitude* *43°33.811 N*

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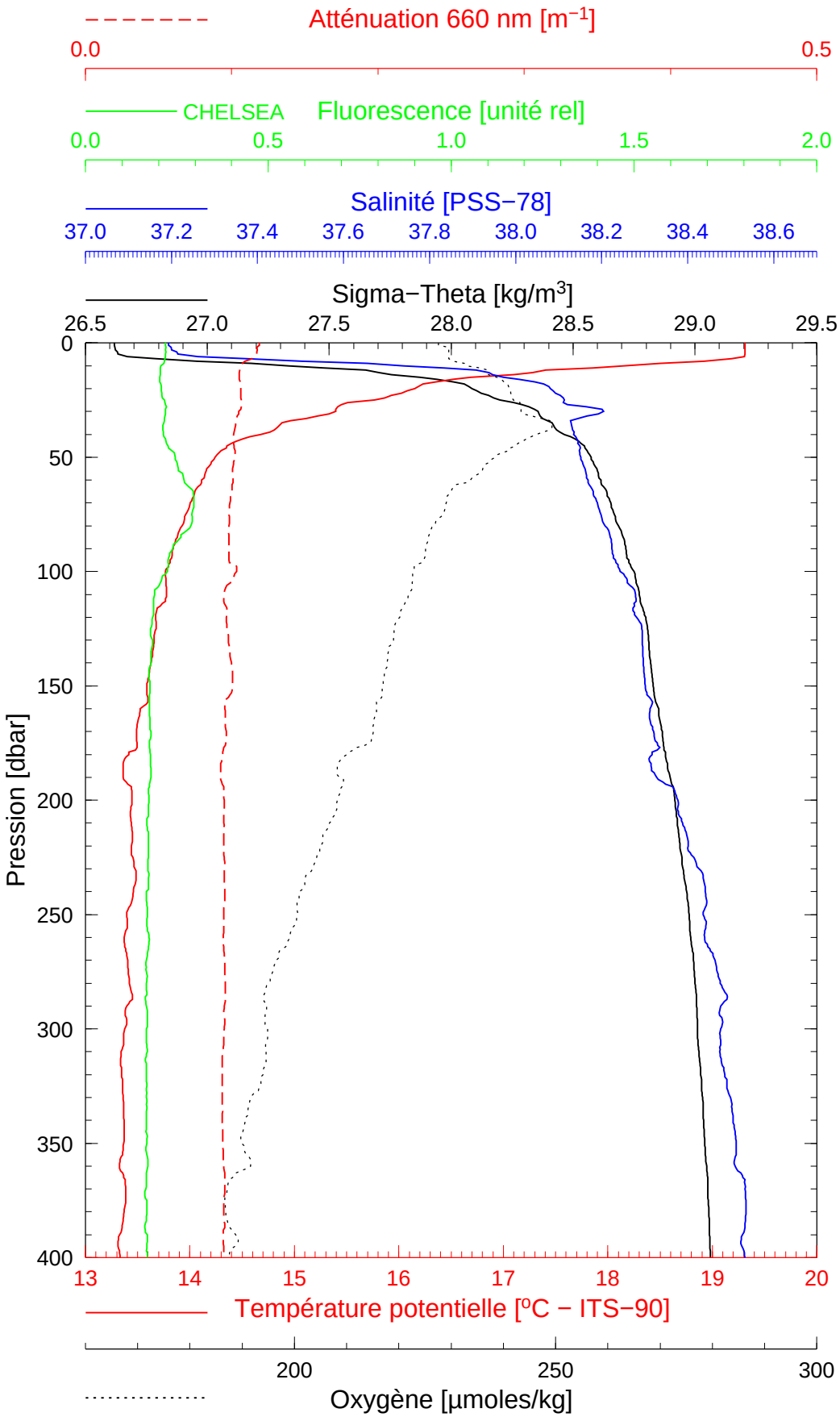
BOUSSOLE 136 **09/06/2013** **BOUS130609_06**

BOUS007

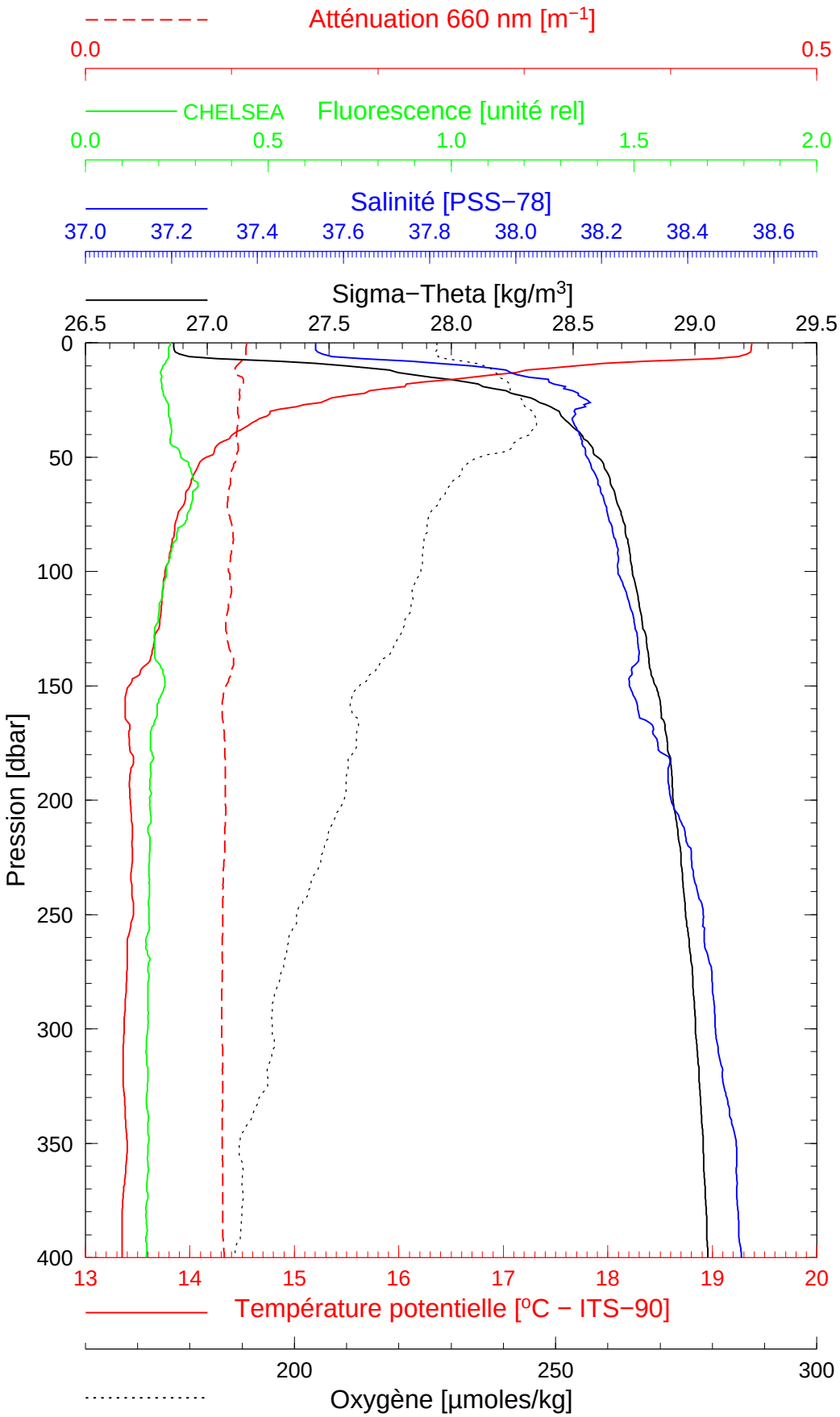


Date *09/06/2013* *Latitude* *43°36.914 N*

Heure déb *16h 10min [TU]* *Longitude* *07°25.095 E*

BOUSSOLE 136 **09/06/2013** **BOUS130609_07**

BOUS008



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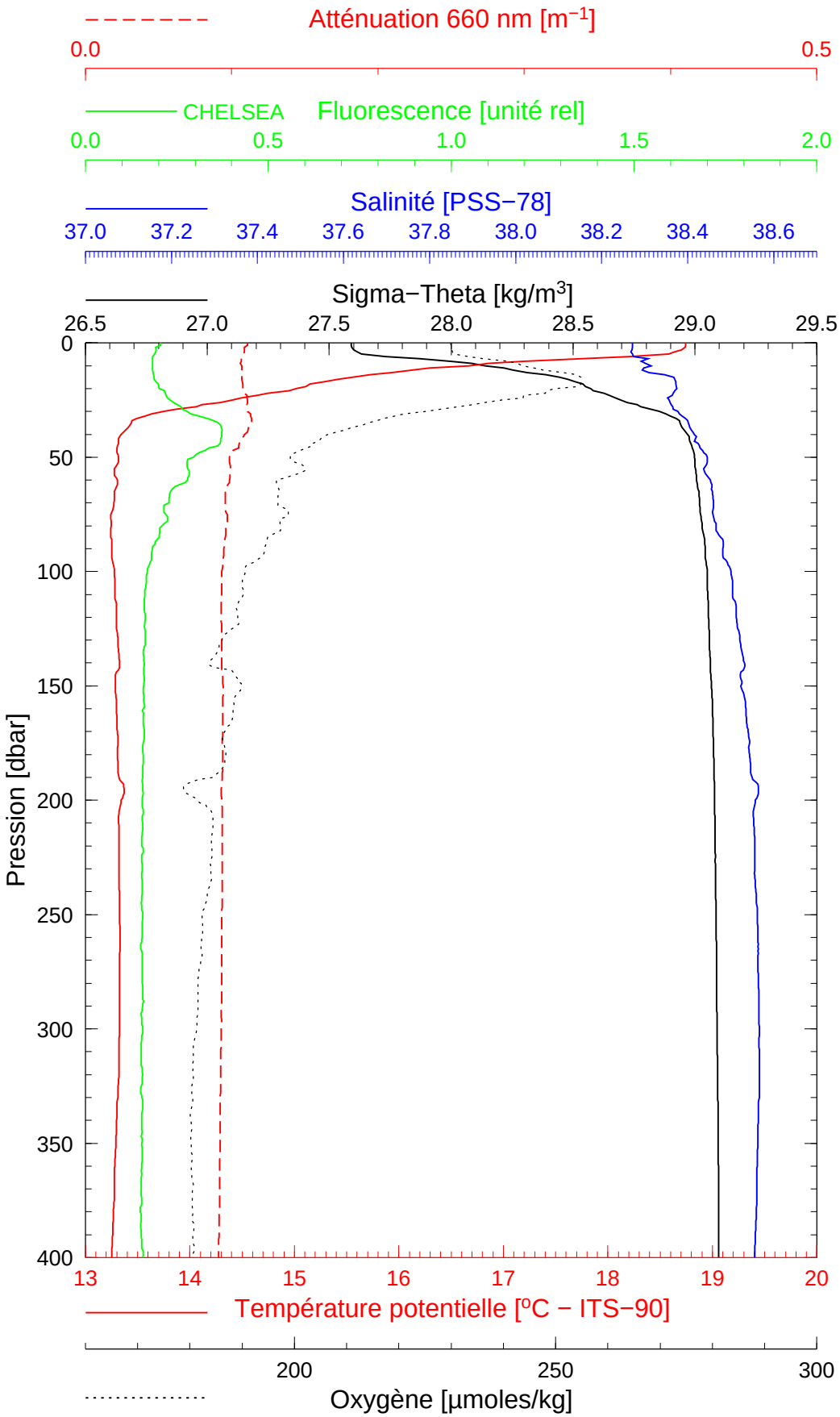
Heure déb *17h 14min [TU]* *Longitude* *07°21.089 E*

BOUSSOLE 136 **10/06/2013** **BOUS130610_01**

BOUS009



Date *10/06/2013* *Latitude* *43°22.315 N*

Heure déb *09h 22min [TU]* *Longitude* *07°54.006 E*