BOUSSOLE Monthly Cruise Report

Cruise 106
January 18 - 21, 2011

Duty Chiefs: Emilie Diamond (diamond@obs-vlfr.fr)
Vessel: R/V Téthys II
(Captain: Alain Stéphan)

Science Personnel: Emilie Diamond, Yves Lamblard, David Luquet, Didier Robin, Vincent Taillandier, Vincenzo Vellucci and Pascal (diver).

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

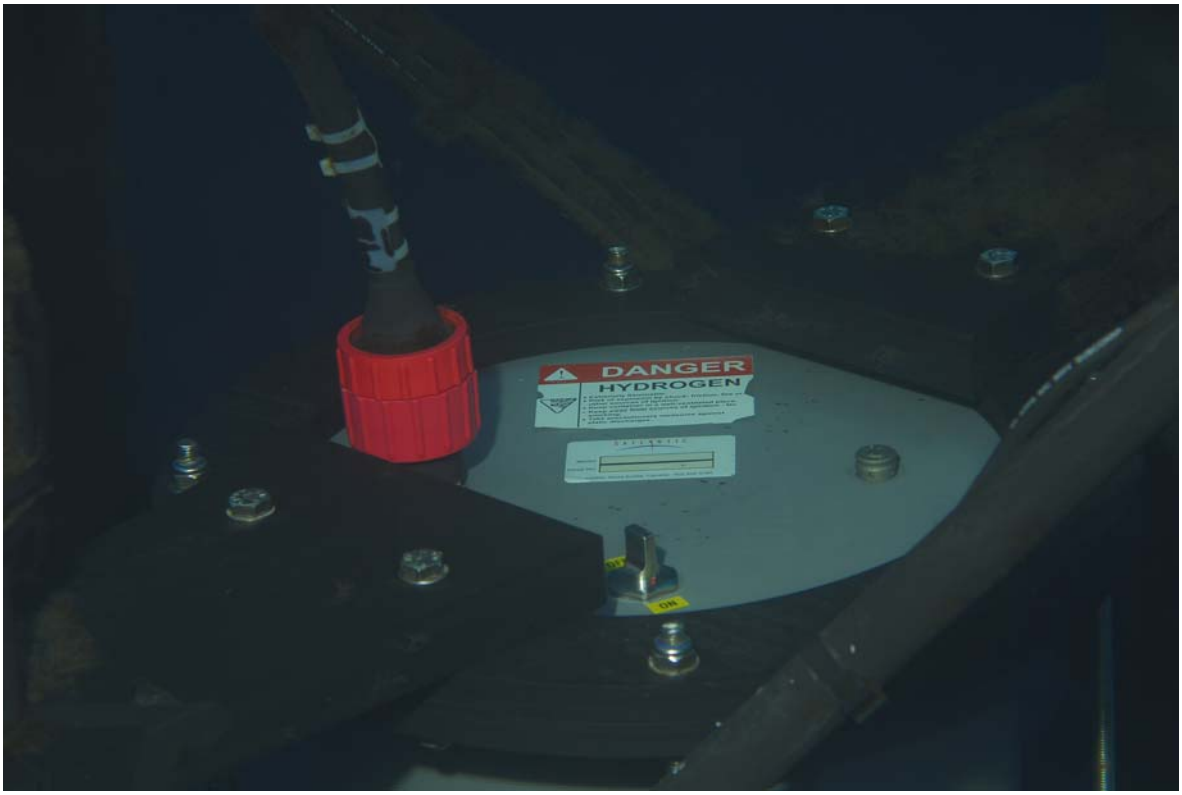


Figure 1. The buoy battery was taken off the buoy, recharged during one day and put back on the buoy by divers.

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

January 26, 2011

Contents

Cruise Objectives

Routine operations

Multiple SPMR profiles are to occur within about 1 hour of satellite overhead passes of MERIS around solar noon, under optimal conditions: clear blue skies and flat, calm sea surface. From last mission, we restart deploying the SPMR SN 006 and its SMSR reference SN 006. From April 2010, we perform optical profiles with a Biospherical's C-OPS (Compact Optical Profiling System) on 0-200 m at the BOUSSOLE site. It will replace the SPMR/SMSR system at short-term. 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 SPMR or 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. A floating platform is to be used to support the SPMR Eu sensor approximately 20cm below the surface for up to 3 minutes of stable light field before a release mechanism triggers the release of the profiler to start a descent as normal. Multiple descents ideally will be started in this way and the data will be used to assess near-surface Eu extrapolation model calculations. CTD deployments are required at the start and end of the SPMR 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 in N_2 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 (TSM) weighting in the lab. A gimbled PAR sensor positioned on the foredeck and operated from the CTD computer serves as a light field stability indicator during SPMR profiling (until summer of 2007).

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. The time of day of this transect should be similar for each cruise, if possible to minimise 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 surface, 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 2009).

Additional operations

Since the end of October 2010, one of the buoy solar panels was partly damaged. And with the unusual overcast weather from the end of December, the buoy battery level was too low to insure the well working of the buoy.
The first day, divers took off the buoy battery and put it back the second day after 24 hours of charging. The damaged solar panel was changed. The SPMR/SMSR and the C-OPS came back from calibration the 20th so they were not used this time because of the bad weather conditions of the two last cruise days. But during this mission, another Biospherical's C-OPS (with Lu and Ed sensors) has been tested at BOUSSOLE. It belongs to David Doxaran from the Laboratoire d'Océanographie de Villefranche. In February, it will be tested simultaneously with our C-OPS to compare measurements and profiles.

Cruise Summary

Two of the four cruise days were used due to the bad weather on the two last days. Those days were used for diving operations, optical measurements and CTD casts with water sampling at the BOUSSOLE site. The first day was also used for buoy maintenance and the second day for buoy data retrieval and for completing the transect.

Tuesday 18 January 2011

The first day, the sea was smooth and the sky was overcast a good part of the day, with a good visibility and a moderate breeze. When arrived at the BOUSSOLE site, divers went at sea to clean instruments (which were quite dirty) and to check the general state of the buoy. The Junction Box and the battery were also switched off and the battery taken off and brought on board to be recharged. Then, the damaged solar panel was changed and instruments, CISCO and ARGOS connectors on the top of the buoy were cleaned. After 1 CTD cast without BB3 and AC9 sensors and with water sampling, 1 Secchi disk and 3 C-OPS profiles were performed.

Wednesday 19 January 2011

The second day, the sea was smooth and the sky was overcast, with a good visibility and a light breeze. Before arriving, a new CTD configuration was found to connect the WETLabs ECO-BB3 (backscattering) and AC-9 (absorption and attenuation) sensors to another CTD connector, the usual one being broken just before the cruise. When on site, adjustments on the Biospherical C-OPS frame were made for a better balance of the instrument during the descent phase of profiles. Then 3 C-OPS profiles and 1 CTD cast with water sampling were performed. After, divers went at sea to put the battery back and the system was switched on. A CISCO connection with the buoy was then established for data retrieval. After, the transect was completed.

Thursday 20 January 2011

Bad weather prevented the departure from the Nice port.

Friday 21 January 2011

Bad weather prevented the departure from the Nice port.

Cruise Report

Tuesday 18 January 2011 (UTC)

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

0605 Departure from the Nice port.
0935 Arrival at the BOUSSOLE site.
0940 Diving on the buoy for taking off the battery, for checking the buoy state and for cleaning instruments.
1120 Battery recharged on board (V_i=11.10V).
1130 Substitution of the damaged solar panel and cleaning of instruments, CISCO and ARGOS connections on the top of the buoy.
1355 CTD 01, 400 m with water sampling at 200, 150, 80, 70, 40, 30, 20, 10 and 5 m for HPLC, Ap and TSM.
1430 Secchi disk 01 (11 m).
1450 C-OPS balance tests.
1510 C-OPS 01, 02, 03.
1530 Departure to the Nice port.
1825 Arrival at the Nice port.

Wednesday 19 January 2011 (UTC)

People on board: Emilie Diamond, Vincent Taillandier, Vincenzo Vellucci and 3 divers.

0605 Departure from the Nice port.
0915 Arrival at the BOUSSOLE site.
0920 C-OPS balance tests.
1045 C-OPS 04, 05, 06.
1120 CTD 02, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, Ap and CDOM.
1205 Diving on the buoy for reinstalling the battery (V_f=13.22V).
1245 Battery and Junction Box switched on.
1315 CISCO connection with the buoy and data retrieval.
1330 Departure to the first transect station.
1405 CTD 03, 400 m, station 01 (43°25’N 07°48’E).
1500 CTD 04, 400 m, station 02 (43°28’N 07°42’E).
1555 CTD 05, 400 m, station 03 (43°31’N 07°37’E).
1650 CTD 06, 400 m, station 04 (43°34’N 07°31’E).
1750 CTD 07, 400 m, station 05 (43°37’N 07°25’E).
1845 CTD 08, 400 m, station 06 (43°39’N 07°21’E).
1915 Departure to the Nice port.
1945 Arrival at the Nice port.

Thursday 20 January 2011

Bad weather prevented the departure from the Nice port.

Friday 21 January 2011

Bad weather prevented the departure from the Nice port.

Problems identified during the cruise

- The SPMR/SMSR and the C-OPS came back from calibration the 20th instead of the 17th. They were not used at all because of bad weather during the two last cruise days. But during this mission, the Biospherical's C-OPS of David Doxaran (with Lu and Ed sensors) has been tested at BOUSSOLE.
- The BOUSSOLE CTD connector, which was usually used for the transmissiometer, the AC-9 and the BB3 connection, was broken just before the cruise. Vincent Taillandier, in charge of the CTD, made the new connecting branch the 19th so CDOM, BB3 backscattering and AC-9 absorption and attenuation data were available only from the CTD 002 profile.
- Bad weather prevented departure from the Nice port for two days.

Calculated Swath paths for the MERIS Sensor (Esov NG Software)

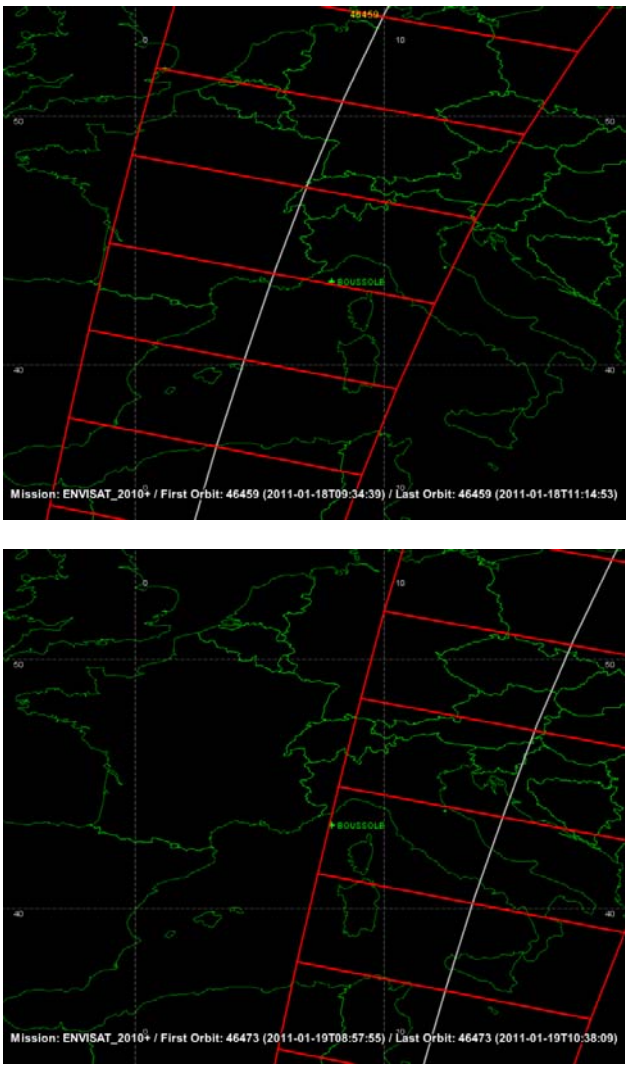


Figure 2. Calculated swath paths for MERIS (Esov NG software) above BOUSSOLE site for 18th and 19th January 2011.

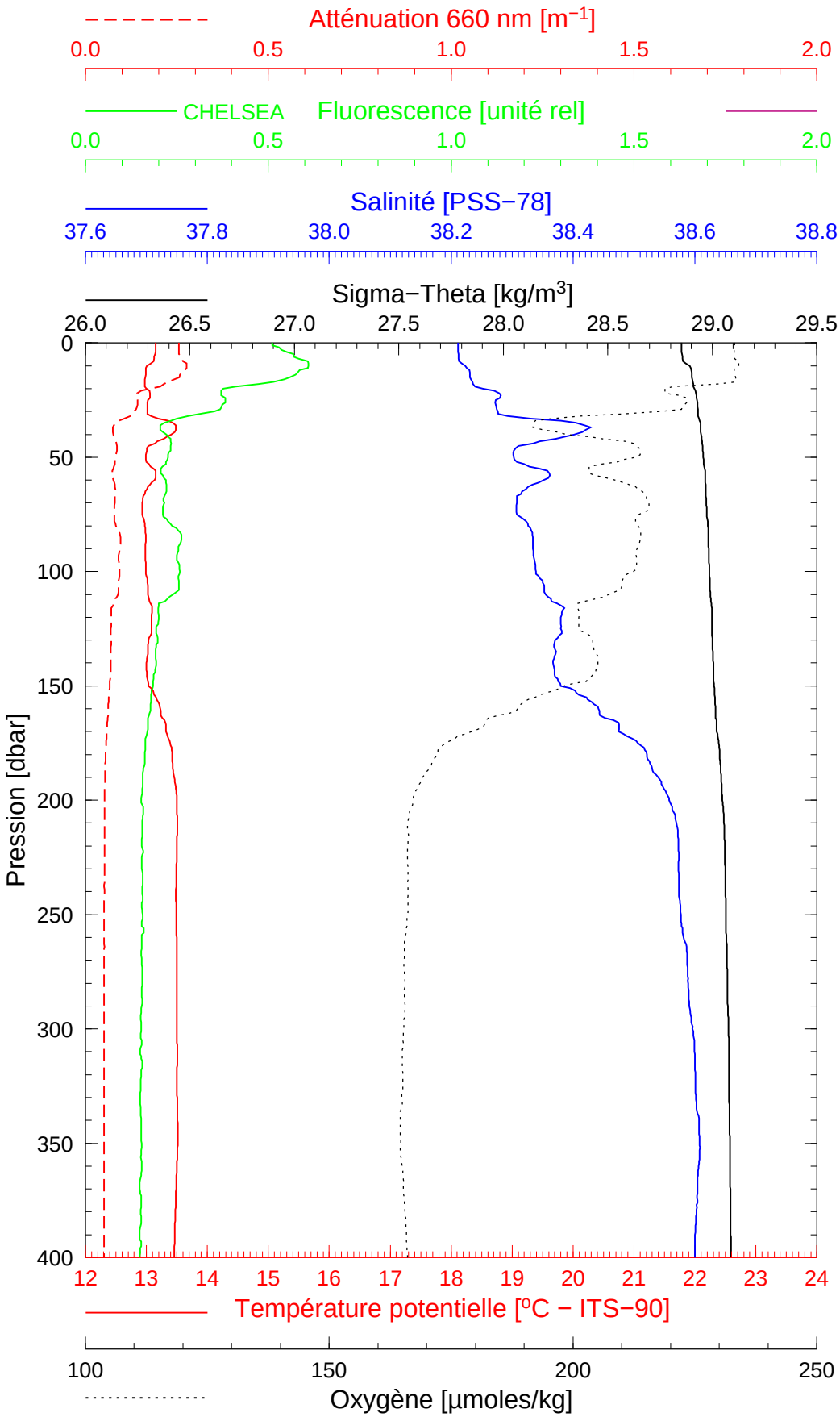
Appendix

Cruise Summary Table for Boussole 106

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	13:58	28:00	400	43	22.151	7	54.094	overcast		7	10	100	1023.1	81		11.7	13.1	calm			no
				Secchi01	14:30	3:00	11	43	22	7	54	overcast		5					good			calm			no
	bou_c-ops_110118_1449_001_data				14:52	1:23																		
18/01/11		bou_c-ops_110118_1449_003_data			15:11	2:22	42.8	43	22.215	7	53.720	blue	As&Cu	3	12	302	1023.0	82	good	11.5		calm	0.6		no
		bou_c-ops_110118_1449_004_data			15:16	1:24	21.5	43	22.318	7	53.597	blue	As&Cu	3	12	302	1023.0	82	good	11.5		calm	0.6		no
		bou_c-ops_110118_1449_005_data			15:21	1:28	25.3	43	22.448	7	53.501	blue	As&Cu	3	12	302	1023.0	82	good	11.5		calm	0.6		no
	bou_c-ops_110118_1449_006_data				15:38	1:47																		
	bou_c-ops_110119_0914_001_data				09:19	1:19																		
		bou_c-ops_110119_0914_002_data			10:56	1:42	18	43	21.757	7	53.561	overcast	Ns&St	8	2	170	1019.1	78	medium	12.2		calm	0.2		no
		bou_c-ops_110119_0914_003_data			11:03	1:09	17.4	43	21.669	7	53.253	overcast	Ns&St	8	2	170	1019.1	78	medium	12.2		calm	0.2		no
		bou_c-ops_110119_0914_005_data			11:07	2:02	32.4	43	21.527	7	53.175	overcast	Ns&St	8	2	170	1019.1	78	medium	12.2		calm	0.2		no
	bou_c-ops_110119_0914_010_data				12:08	1:17																		
19/01/11			CTDBOUS002	HPLC, Ap & CDOM	11:29	30:00	400	43	21.836	7	54.056	overcast		8	7	13	1019.1	78		12.4	13.2	calm			no
			CTDBOUS003		14:07	25:00	400	43	24.998	7	47.96	overcast		8	10	59	1017.4	83		11.9	13.3	calm			no
			CTDBOUS004		15:06	24:00	400	43	27.982	7	41.900	overcast		8	2	84	1017.1	76		13.1	13.7	calm			no
			CTDBOUS005		15:59	27:00	400	43	30.983	7	36.890	overcast		8	8	60	1017.1	74		13.6	13.8	calm			no
			CTDBOUS006		16:56	25:00	400	43	33.998	7	30.942	night		7	8	53	1017.1	70		14.0	13.5	calm			no
			CTDBOUS007		17:56	27:00	400	43	37.054	7	25.024	night		5	7	63	1017.0	78		12.4	13.5	calm			no
			CTDBOUS008		18:49	26:00	400	43	39.006	7	21.053	night		5	7	246	1016.9	66		14.7	13.5	calm			no
20/01/11	Bad weather																							
21/01/11	Bad weather																							

BOUSSOLE 106 **18/01/2011** **BOUS110118_01**

BOUS001

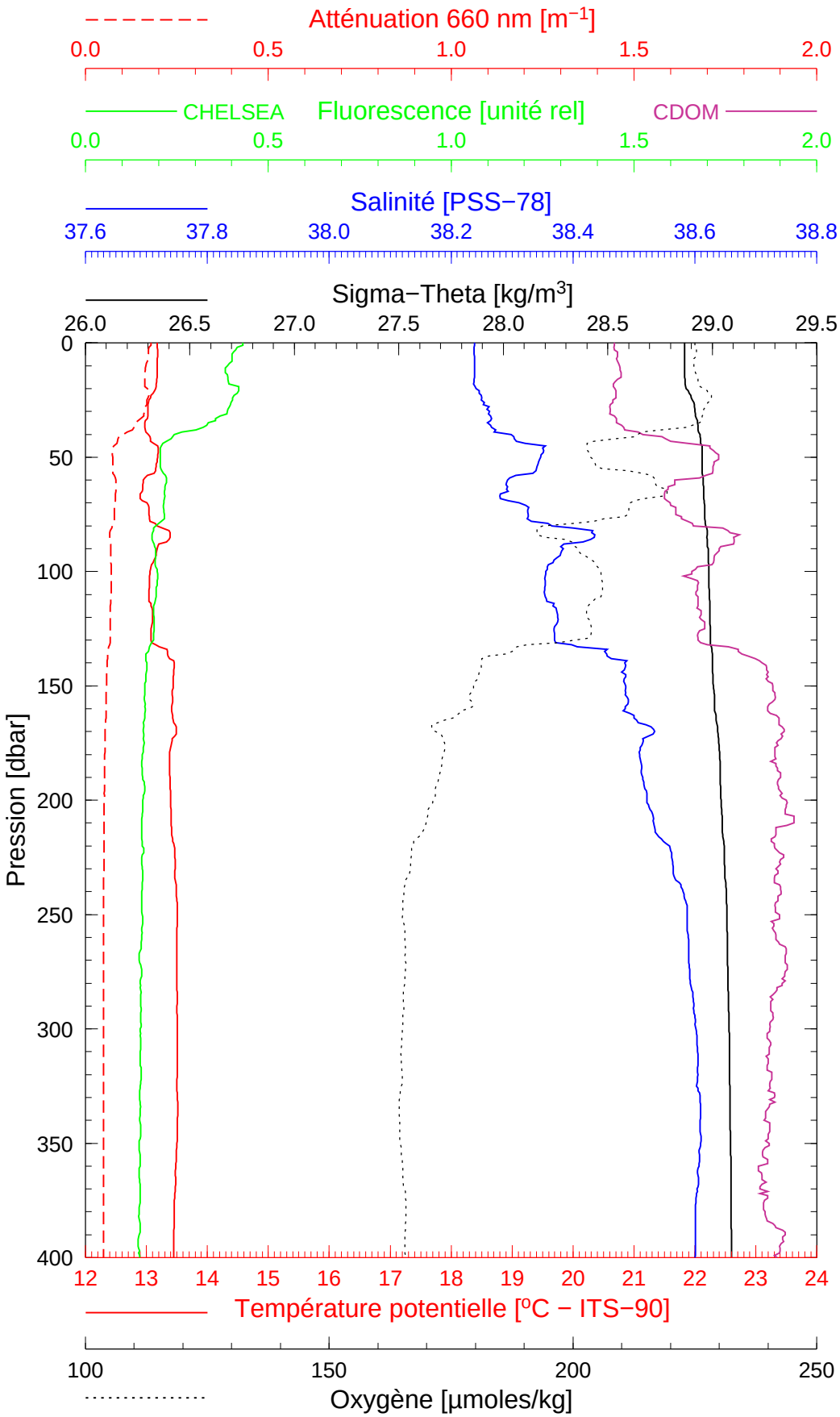


Date *18/01/2011* *Latitude* *43°22.151 N*

Heure déb *13h 58min [TU]* *Longitude* *07°54.094 E*

BOUSSOLE 106 **19/01/2011** **BOUS110119_01**

BOUS002

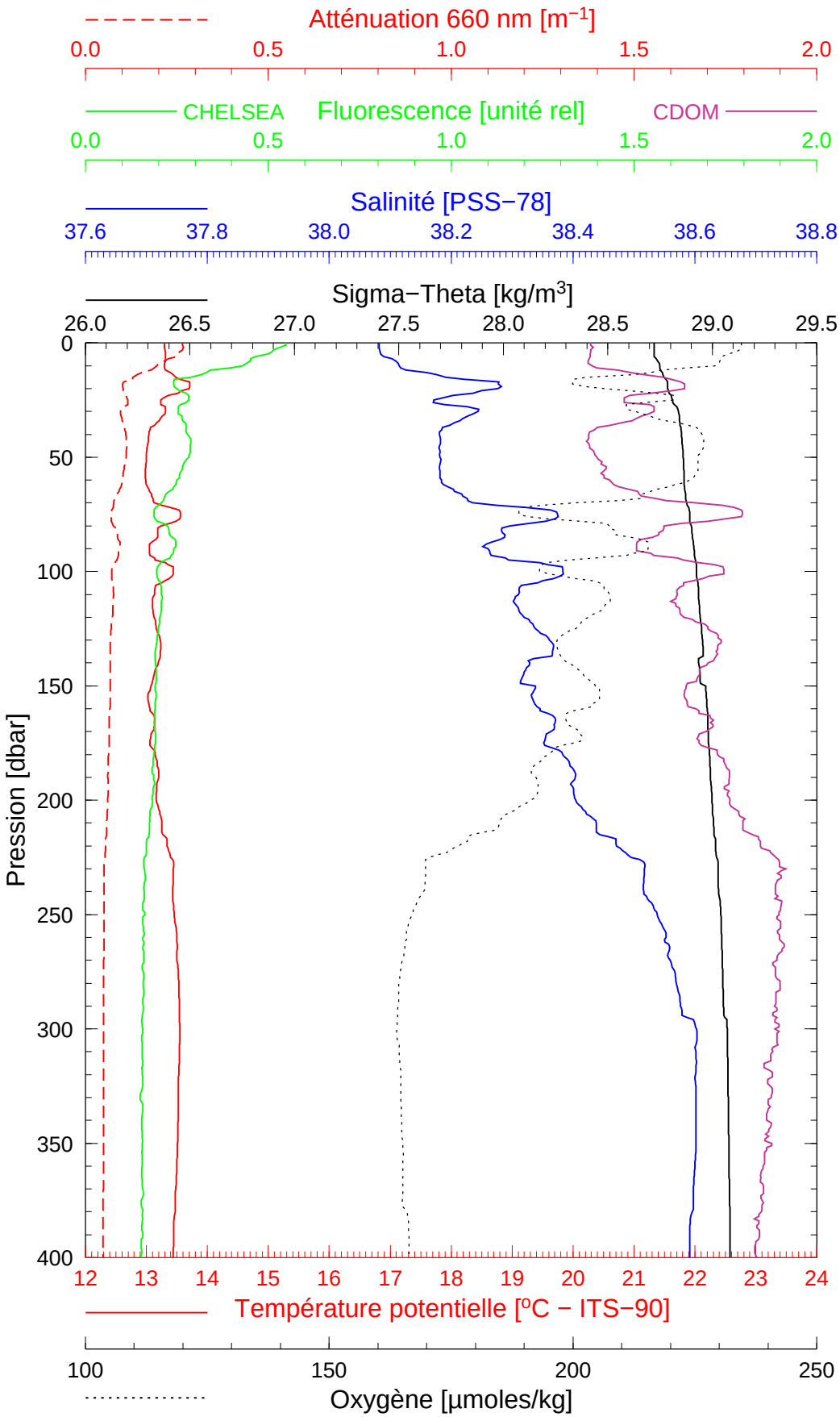


Date *19/01/2011* *Latitude* *43°21.836 N*

Heure déb *11h 29min [TU]* *Longitude* *07°54.056 E*

BOUSSOLE 106 **19/01/2011** **BOUS110119_02**

BOUS003

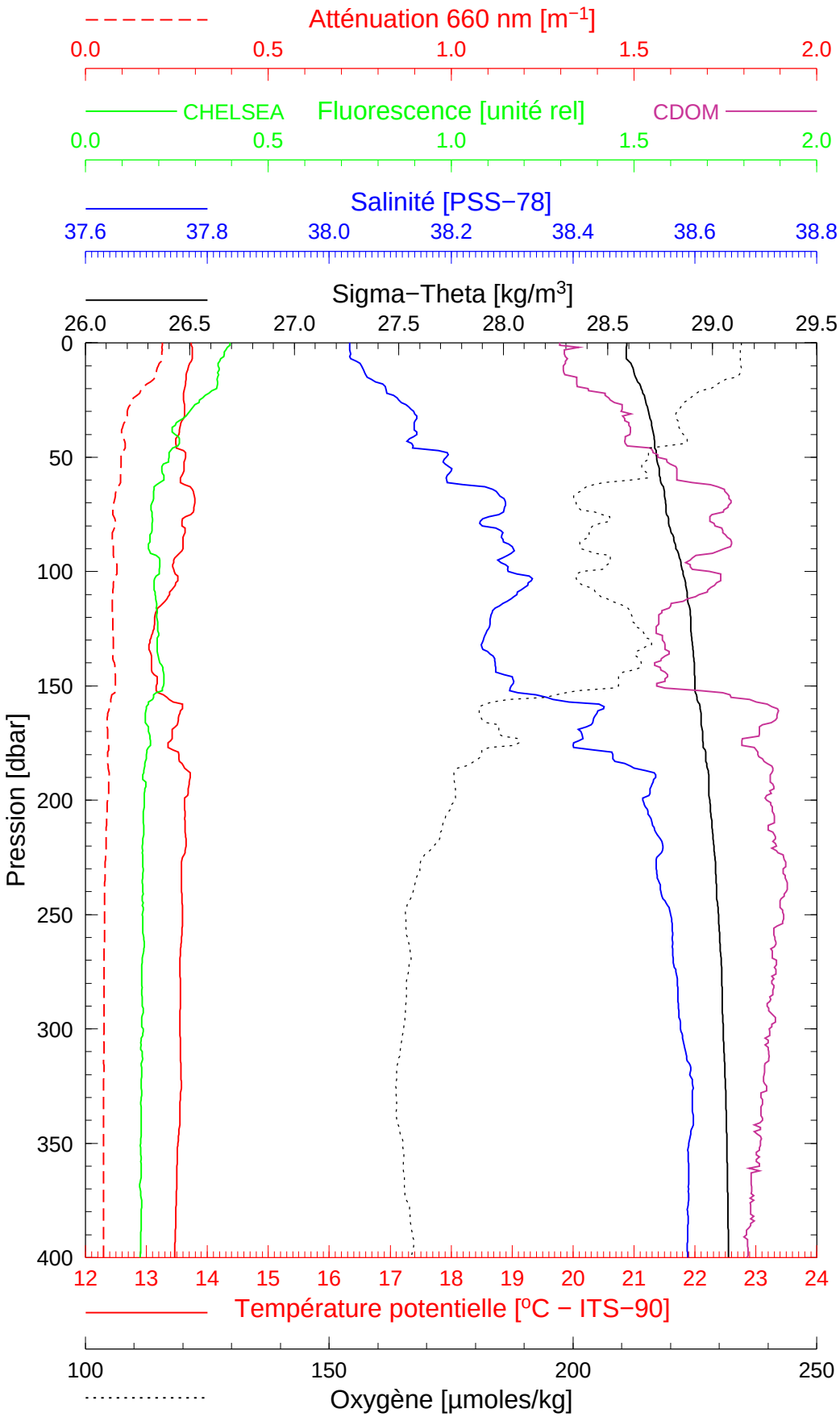


Date *19/01/2011* *Latitude* *43°24.998 N*

Heure déb *14h 07min [TU]* *Longitude* *07°47.960 E*

BOUSSOLE 106 **19/01/2011** **BOUS110119_03**

BOUS004

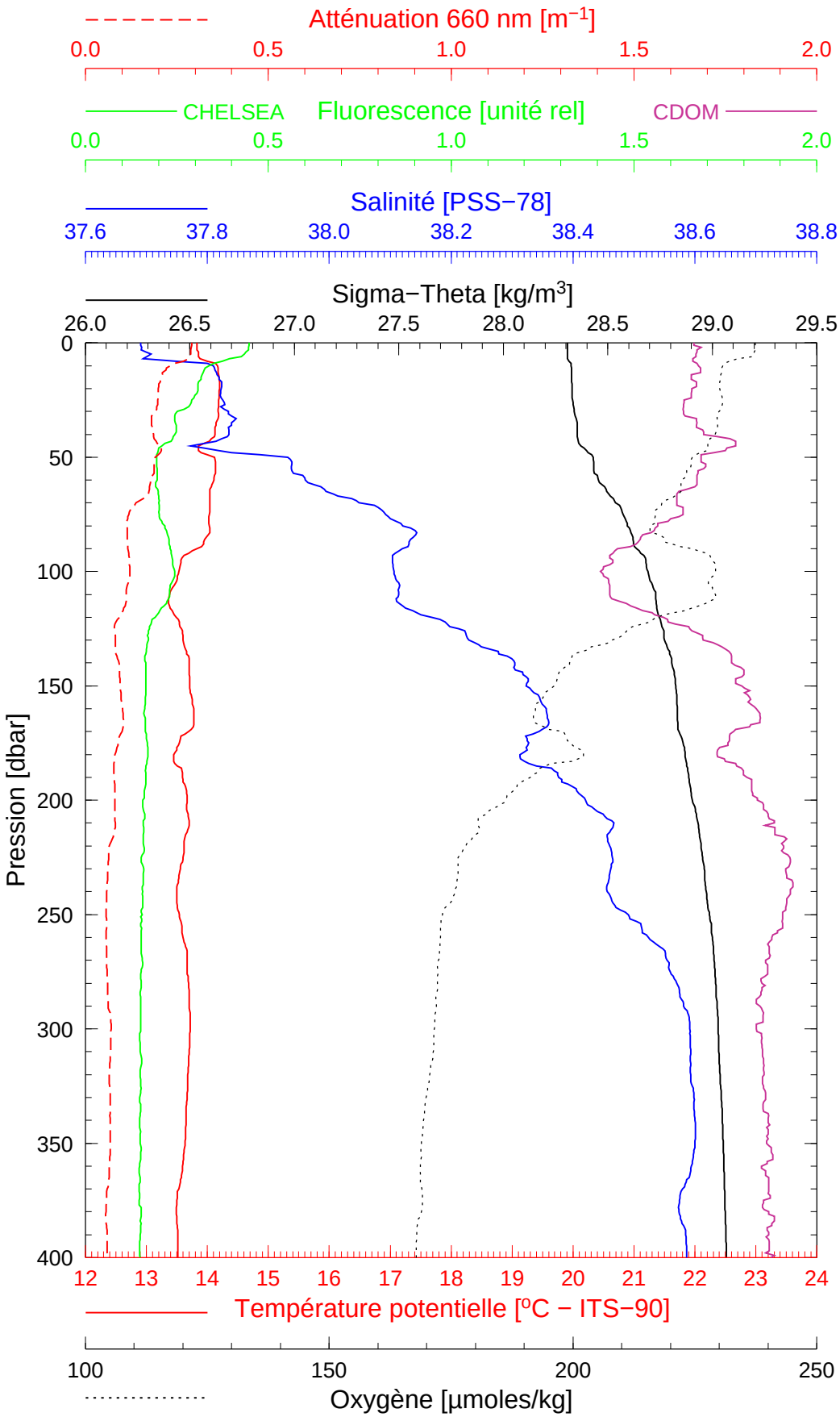


Date *19/01/2011* *Latitude* *43°27.982 N*

Heure déb *15h 06min [TU]* *Longitude* *07°41.900 E*

BOUSSOLE 106 **19/01/2011** **BOUS110119_04**

BOUS005

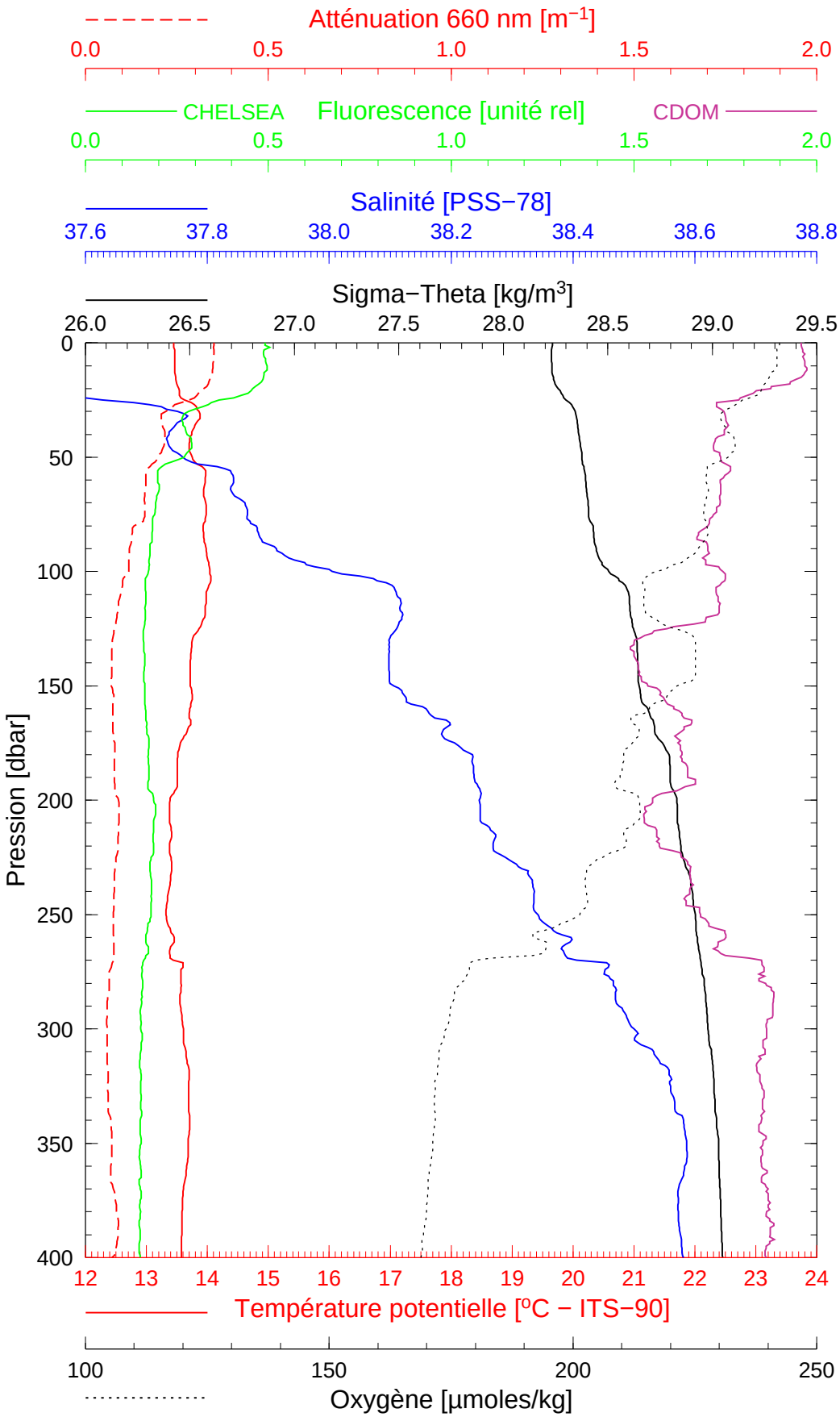


Date *19/01/2011* *Latitude* *43°30.583 N*

Heure déb *15h 59min [TU]* *Longitude* *07°36.890 E*

BOUSSOLE 106 **19/01/2011** **BOUS110119_05**

BOUS006

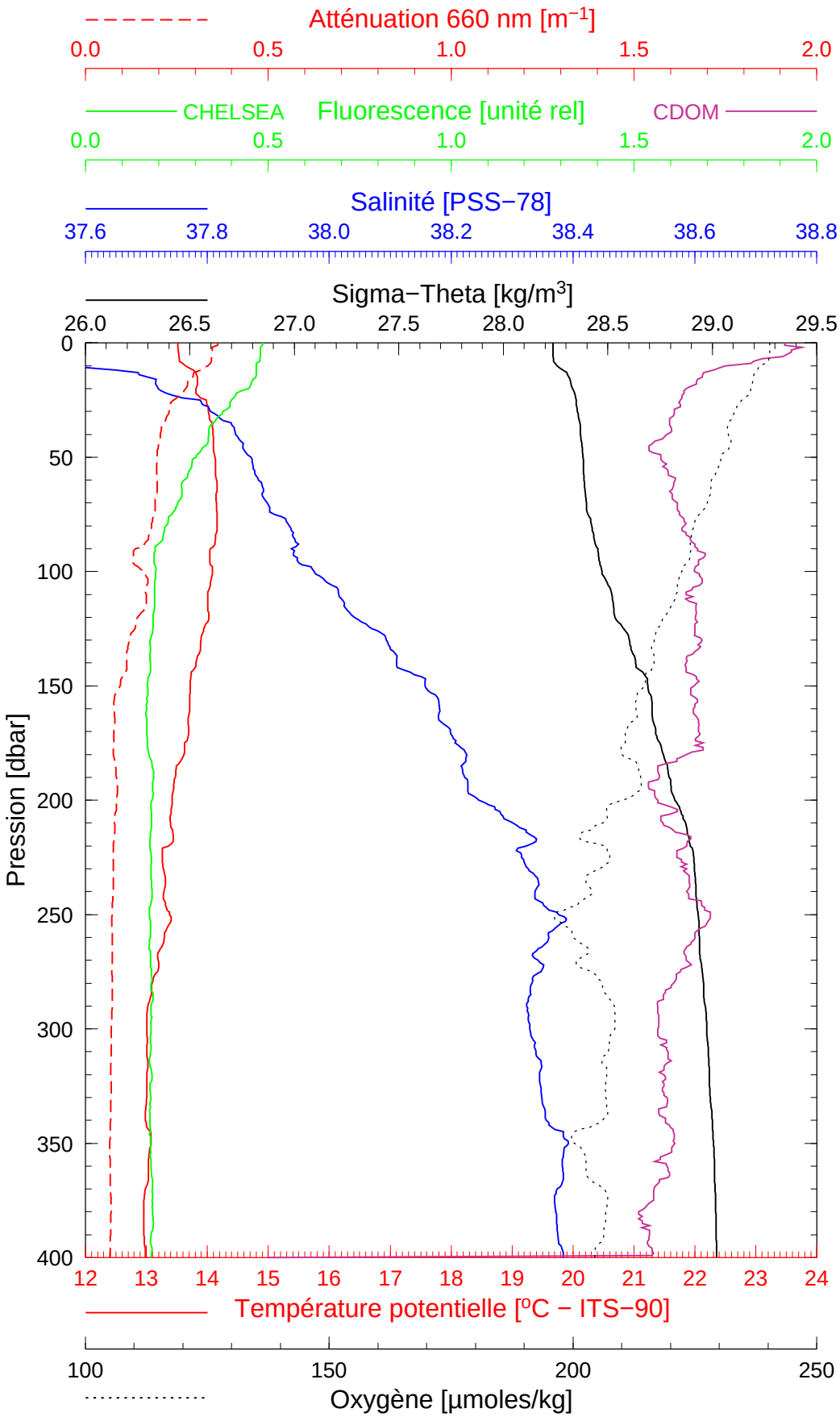


Date *19/01/2011* *Latitude* *43°33.998 N*

Heure déb *16h 56min [TU]* *Longitude* *07°30.942 E*

BOUSSOLE 106 **19/01/2011** **BOUS110119_06**

BOUS007

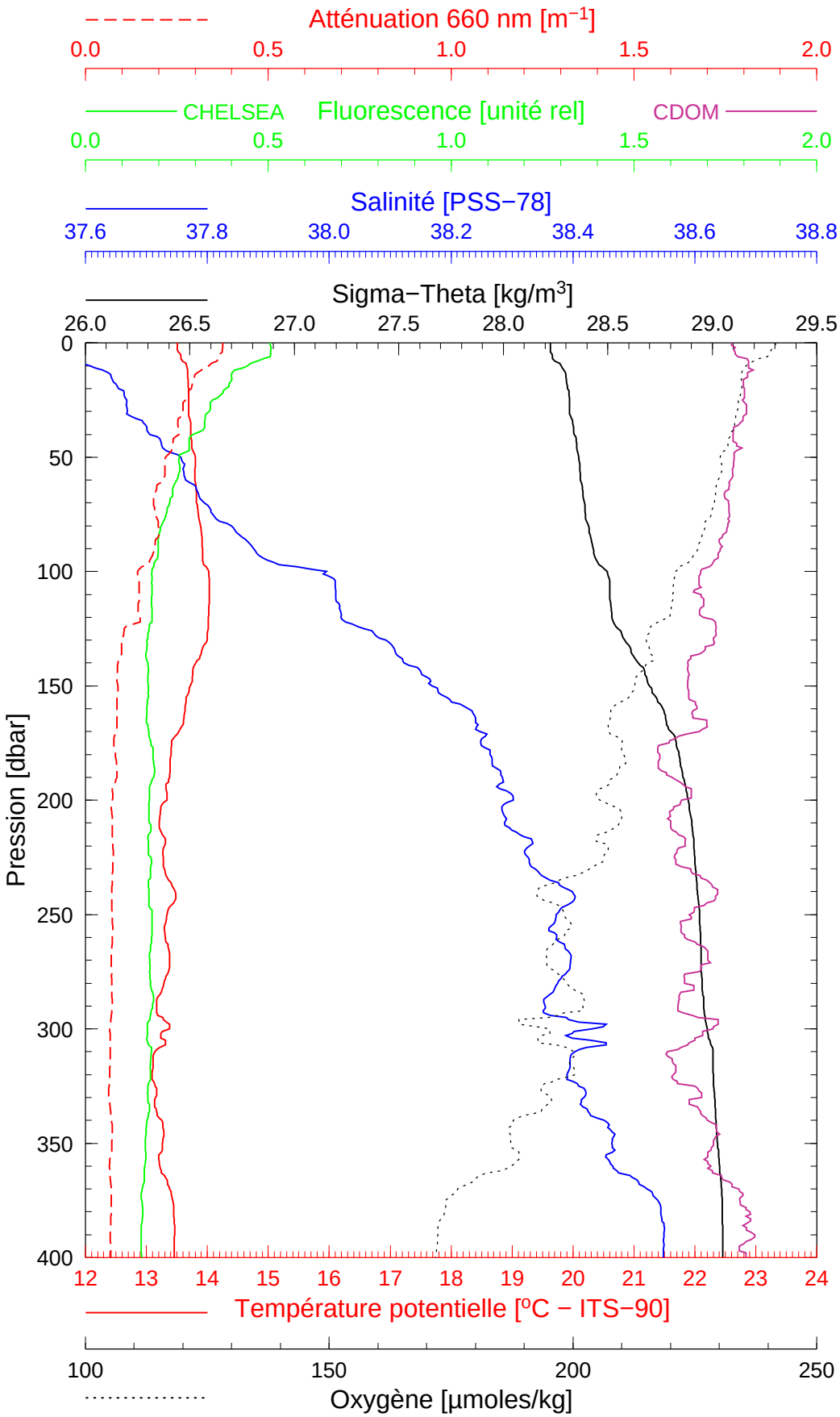


Date *19/01/2011* *Latitude* *43°37.054 N*

Heure déb *17h 56min [TU]* *Longitude* *07°25.024 E*

BOUSSOLE 106 **19/01/2011** **BOUS110119_07**

BOUS008



Date *19/01/2011* *Latitude* *43°39.006 N*

Heure déb *18h 49min [TU]* *Longitude* *07°21.053 E*