

BOUSSOLE Monthly Cruise Report

Cruise 61

February 20 - 23, 2007

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Vessel: R/V Téthys II

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Fig 1. Only the lower structure of the buoy remains after the accident (collision with a boat ?) that occurred on February 12, 2007.

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

March 1, 2007



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Cruise Objectives

Routine operations

Multiple SPMR profiles are to occur within 1 hour of satellite overhead passes of MERIS 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 SPMR 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 and AC9, seawater samples are to be collected, filtered and stored in N₂ for HPLC pigment and particulate absorption spectrophotometric filter analysis in the lab. A gimbed PAR sensor positioned on the foredeck and operated from the CTD computer serves as a light field stability indicator during SPMR profiling.

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 four fixed locations on-route from Boussole and a final two station positions to be decided during the transect in order to sample on both sides of the main frontal structure between the coastal waters and Ligurian Sea. The time of day of this transect should be similar for each cruise, if possible to minimise influence of diurnal variability.

Additional operations

A PVM profile was performed on Friday 23, 2007. The upper part of the buoy was installed on the last day of the cruise (by divers from IX SURVEY from another ship, the GGIX).

Cruise Summary

When arriving at the BOUSSOLE site on the first day of the cruise, the buoy was not found. As the weather was rather windy (20 knots), the ship stayed around the BOUSSOLE point (at about 500 meters, to avoid striking the head of the buoy if present) for more than one day, waiting the buoy to emerge. Unfortunately, after one night turning around the point, no signal appeared on the ship radar. As the current was not so strong, the absence of the buoy was found to be suspicious, so that the ship went back to Nice to fetch 3 divers, in order to explore the BOUSSOLE site below the sea surface (the weather forecast for the 3rd day was very good).

So, on the 3rd day, 1 diver was towed with the inflatable dinghy about 15 meters below the sea surface, all around the BOUSSOLE nominal point. Nothing was seen, so that the Tethys-2 could approach the point and explore under the sea surface with the sounder with no risk to strike the head of the buoy. Finally, one signal was received from a depth of 20 meters, and when the divers went at sea at this point, they found only the lower part of the buoy, with only 1 screw remaining from the upper part.

Finally, as the buoy lower part was found to be in a very good state by the divers, the new upper part was installed on the last day of the cruise by divers from IX SURVEY divers (divers from former SAMAR company work now for IX SURVEY), while scientific staff from Tethys-2 performed an "usual" BOUSSOLE day of measurements (CTD casts including transect, SPMR, Secchi disk, etc).

Tuesday 20 February 2007

The buoy was not found when arriving at the BOUSSOLE site. The weather was not favourable for any measurements (winds of 20 knots, swell H1/3 around 1.5 to 1.6 meters). The ship stayed around the BOUSSOLE nominal point to find the buoy if it was emerging. The survey last all the night (radar).

Wednesday 21 February 2007

Nothing appeared on the radar during the night. The weather was supposed to calm down, but in fact the wind was always varying around 20 knots, and the swell H1/3 stayed above 1 meter. As the currents were not so strong (less than 1 knots as seen by the ADCP), the absence of the buoy was found to be suspicious. So, a diving operation was organized for the next day, and the ship went back and reached the port of Nice at the end of the

morning. Pictures of the lower part were sent to the IX SURVEY divers for them to decide of the lower platinum state. They found it ok.

Thursday 22 February 2007

One diver was towed by the inflatable dinghy 15 meters below the sea surface and around the BOUSSOLE point for more or less one hour. He didn't see anything (the hand held GPS was perhaps not well configured and the diver was perhaps 40 to 50 meters from the nominal point). The Tethys-2 ship went to the point to explore below the surface with its echo-sounder, with no risk to strike the head of the buoy. It finally found a signal at 20 meters below the surface. The divers went at sea at this point and they found the lower part of the buoy, standing alone. The upper part had disappeared and just one screw remained.

The divers inspected the lower part of the buoy to determine whether or not the new upper part could be installed on the next day, as the weather forecast was excellent for this day. They found the lower part in an excellent state. They also tried to put some new anodes below the floating sphere, but the new model didn't fit the fixing screws (distance between the pair of screws is too large).

One CTD cast was then performed (without water sampling) to test the electric cable and turning contact of the winch, which were repaired the previous afternoon.

Friday 23 February 2007

Apart the new upper part installation operations by divers from IX SURVEY company, the scientific staff of the Tethys-2 performed a standard BOUSSOLE day: 7 CTD casts (among which 6 were performed on the transect between the BOUSSOLE site and Nice), 3 SPMR profiles, 1 Secchi disk measurements, one CIMEL measurement, dry weights filtration, and a PVM profile at 1000 m.

Cruise Report

20 February 2007 (UTC)

0825 Departure from the port of Nice.
1200 No buoy at the BOUSSOLE site, so the ship turned around at 500 meters, waiting the buoy to emerge.
Night at the site.

21 February 2007

0530 Still waiting the buoy to emerge, but nothing appeared on the radar during the night.
0715 Departure from the BOUSSOLE site as the weather is still windy.
1030 Arriving at the port of Nice, and diving operation organization for the next day, as well as some maintenance on the CTD winch (electric cable and turning contact).

22 February 2007

0530 Departure from the port of Nice.
0820 Diver towed by the dinghy to explore under the sea surface around the BOUSSOLE nominal point.
1000 The Tethys-2 echo-sounder find the lower part of the buoy, the upper part having disappeared.
1115 CTD 01, 400 m, close to the buoy, without water sampling, just to test the eve maintenance of the winch.
1130 Departure from the site to send the pictures to the IX SURVEY divers.
1500 Arrival at the port of Nice.

23 February 2007

0530 Departure from the port of Nice.
0900 CTD 02, 400 m, close to the buoy, with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters for HPLC and Ap. TSM determination from 20, 10 and 5 meters sampling.
1000 PVM profile, close to the buoy, 1000 m.
1020 Secchi disk measurement 1, close to the buoy (depth: 20 meters).
1047 SPMR 1, 2, 3, 5 and 6 (some pb with profiles 3, 4 and a part of profile 5).
1242 CTD 03 at station 1 (43°25'N 07°48'E).

- 1251 CIMEL 01, close to the buoy.
- 1339 CTD 04 at station 2 (43°28'N 07°42'E).
- 1435 CTD 05 at station 3 (43°31'N 07°37'E).
- 1534 CTD 06 at station 4 (43°34'N 07°31'E).
- 1635 CTD 07 at station 5 (43°37'N 07°25'E).
- 1724 CTD 08 at station 6 (43°39'N 07°21'E).
- 1815 Arrival at the port of Nice.

Calculated Swath paths for the MERIS Sensor (ESOV Software)

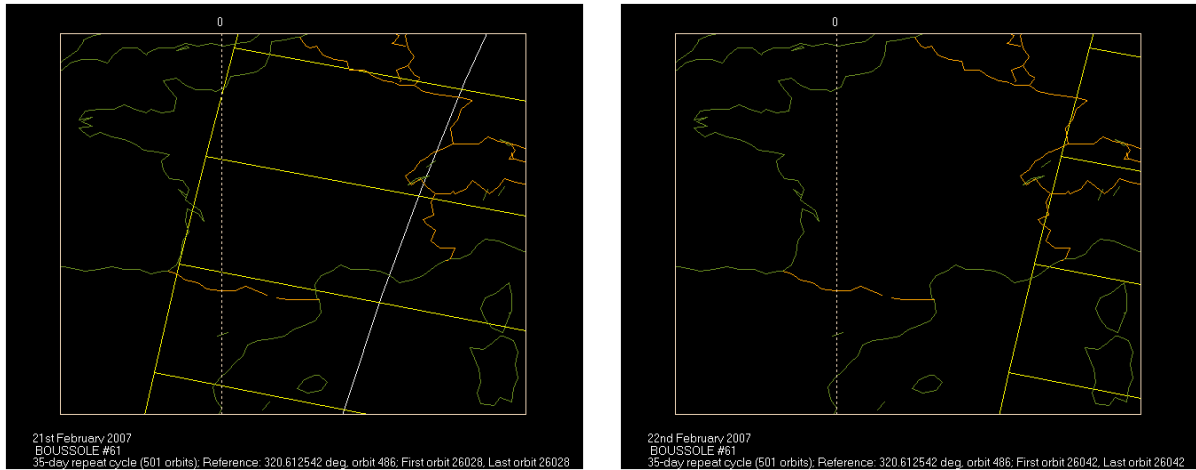
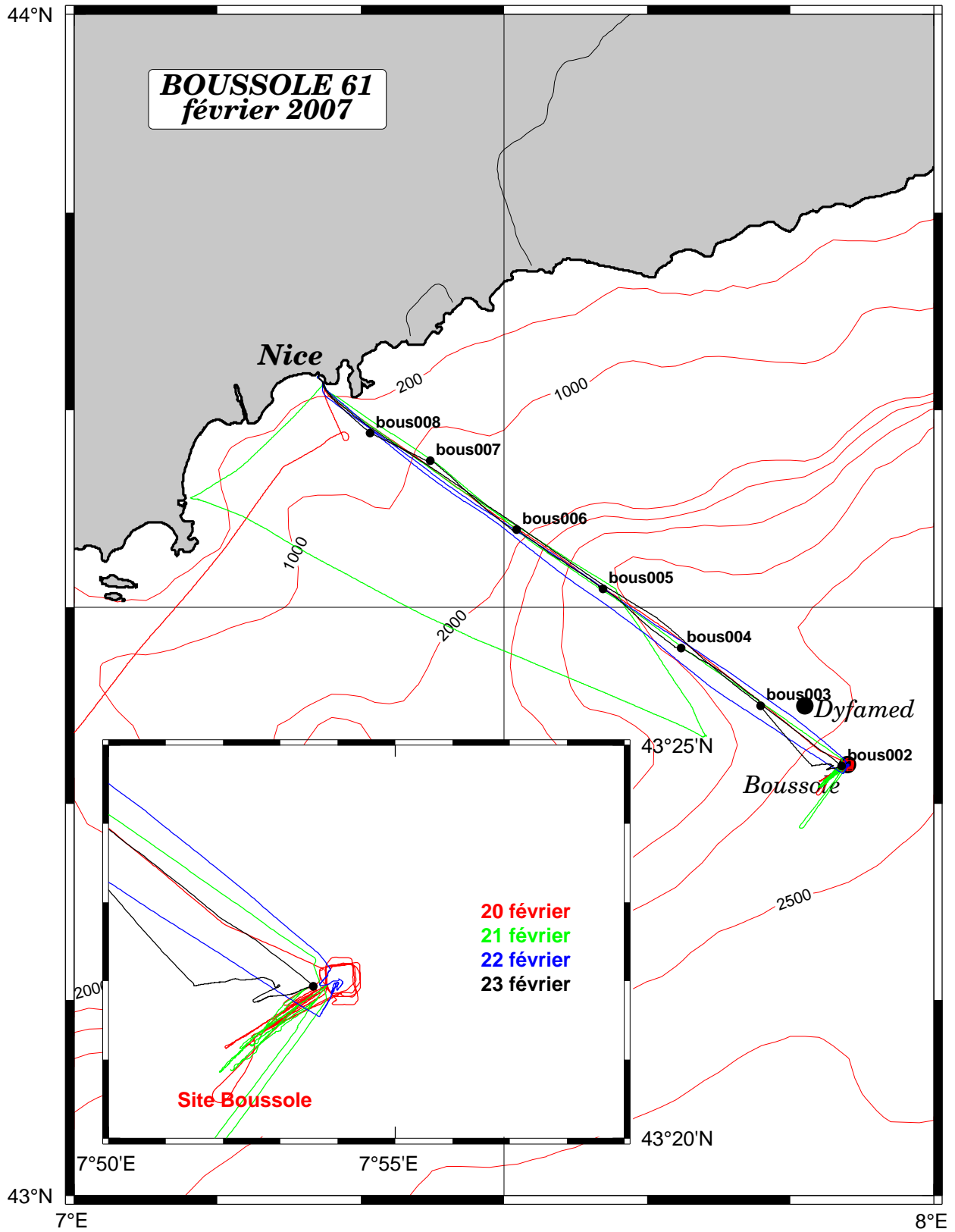


Figure 2. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for February 21 and 22, 2007.

Appendix

Cruise Summary Table for Bousole 61

Date	Black names (file ext. ".raw")	Profile names (file extension: ".raw")	CTD notes/ satellite overpass	GMT	Start Time (hour:min)	Duration (min:sec)	Depth max (meter)	Latitude (N) (Degree) (Minute)	Longitude (Degree) (Minute)	Other sensors Their cast Start/Finish	Sky	Clouds homog.	Quantity (#/6)	Weather Wind speed	Wind dir.	Am. Pressure	humidity	Visibility	T air	T water	Sea	Sea Swell height	Swell dir.	Whitcaps yes	
22/02/2007			CTDBOUS001	11:18	27:00	25:00	400	43 21.805	7 53.881		covered	homog.	6	10 kn	31	1015.3	83	good	13.3	13.1	choppy			no	
			CTDBOUS002	10:00	27:00	45:00	1000	43 21.836	7 53.570		covered	homog.	6	2 kn	261	1014.5	85	good	13.0	13.3	calm			no	
				10:20	05:00	05:00	20	43 22.000	7 54.000	P/M Secchi dbk 01	covered	homog.	6												
				10:51	03:00	03:00	200	43 21.950	7 53.550		covered	homog.	6	2 kn	230	1013.9	82	good	14.7		calm			no	
				12:01	05:26	04:28	210	43 21.990	7 53.550		covered	homog.	6	2 kn	230	1013.9	82	good	14.7		calm			no	
				12:12	04:28	00:36	214 to 243	43 21.950	7 53.550		covered	homog.	6	2 kn	230	1013.9	82	good	14.7		calm			no	
				12:15	00:16	01:22	at 250	43 21.950	7 53.550		covered	homog.	6	2 kn	230	1013.9	82	good	14.7		calm			no	
				12:26	04:42	04:29	205	43 21.950	7 53.550		covered	homog.	6	2 kn	230	1013.9	82	good	14.7		calm			no	
				12:37	04:29	05:00	200	43 21.950	7 53.550		covered	homog.	6	2 kn	230	1013.9	82	good	14.7		calm			no	
				12:38	05:00	05:00	14	43 36.000	7 54.000	Secchi dbk 01	overcast	homog.	7	2 kn	222	1013.8	82	good	13.5	13.4	calm			no	
23/02/2007			CTDBOUS003	12:42	25:00	24:00	400	43 24.980	7 47.905		covered	homog.	6	7 kn	196	1013.3	79	good	12.9	14.0	calm			no	
			CTDBOUS004	13:39	24:00	24:00	400	43 27.940	7 46.373		covered	homog.	6	6 kn	187	1013.2	78	good	12.9	13.5	calm			no	
			CTDBOUS005	14:35	25:00	24:00	400	43 30.938	7 36.307		overcast	homog.	8	6 kn	187	1013.2	79	good	12.8	13.9	calm			no	
			CTDBOUS006	15:34	24:00	24:00	400	43 33.943	7 30.895		overcast	homog.	8	4 kn	206	1013.4	80	good	13.0	14.5	calm			no	
			CTDBOUS007	16:35	25:00	25:00	400	43 37.450	7 24.870		overcast	homog.	8	5 kn	225	1013.4	80	good	13.0	14.5	calm			no	
			CTDBOUS008	17:24	24:00	24:00	400	43 38.854	7 20.847		night	night	9	3 kn	204	1013.6	80	good	13.0	14.6	calm			no	

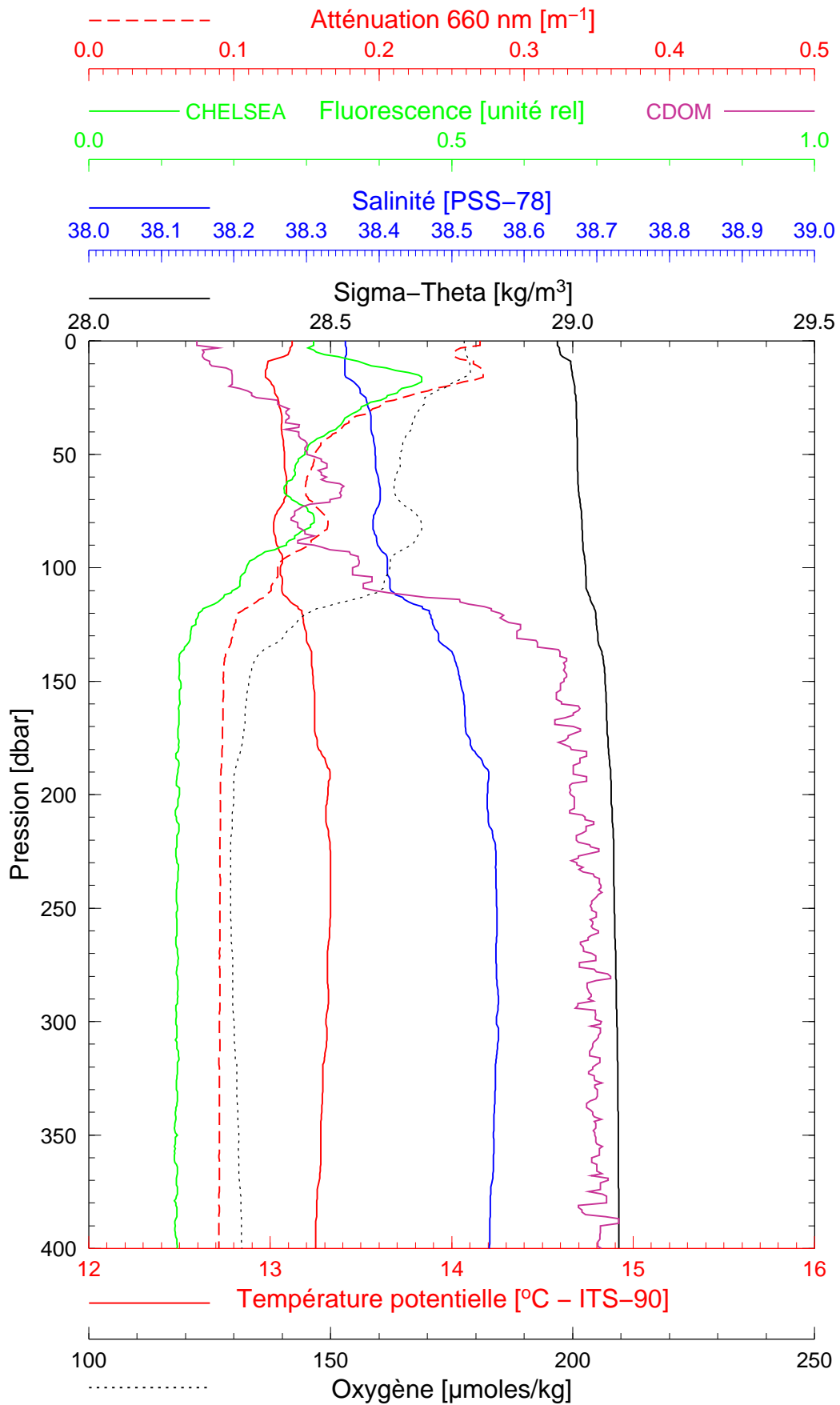


Boussole 61

22/02/2007

BOUS070222_01

BOUS001



Date 22/02/2007
Heure déb 11h 18min [TU]

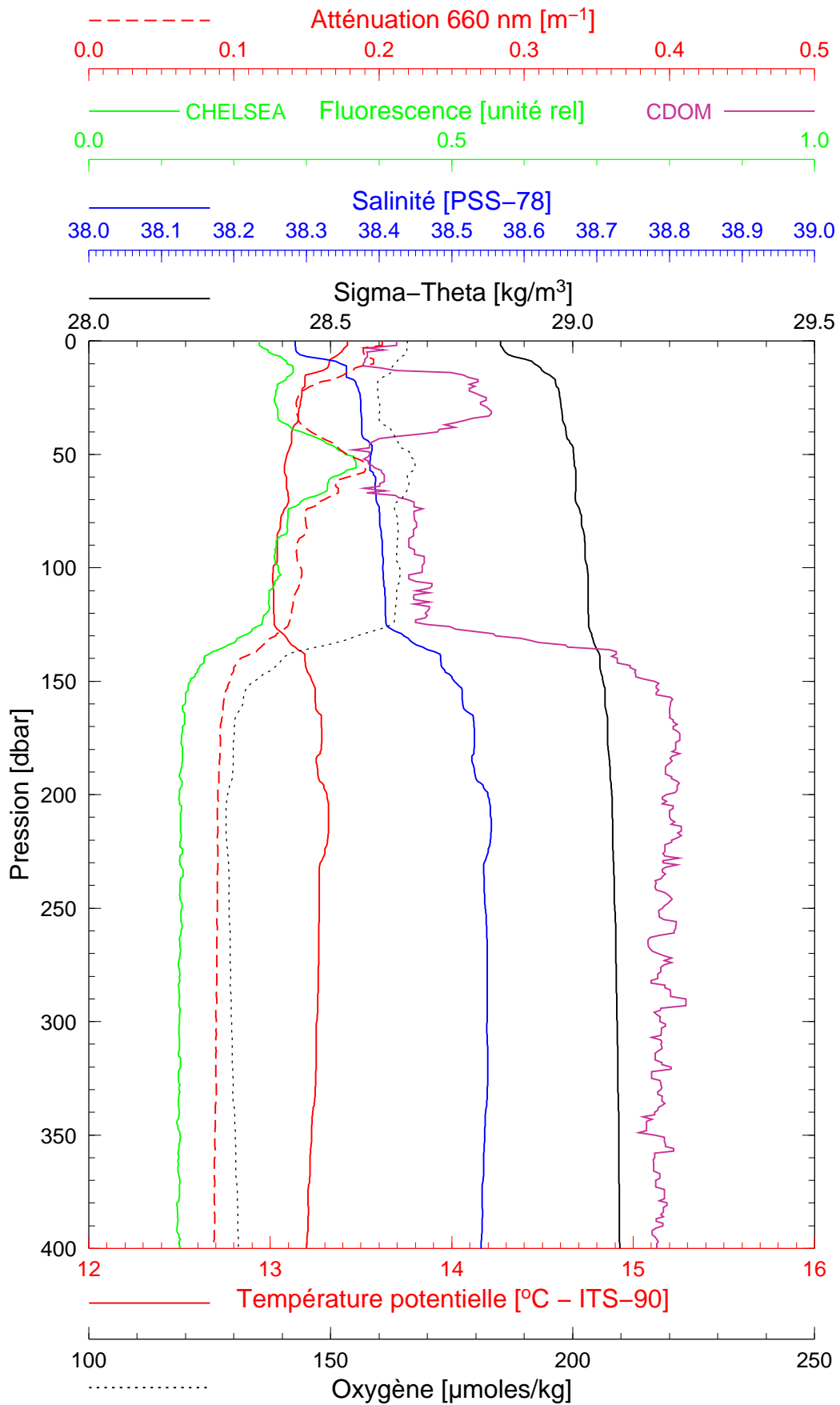
Latitude 43°21.805 N
Longitude 07°53.881 E

Boussole 61

23/02/2007

BOUS070223_01

BOUS002



Date 23/02/2007
Heure déb 09h 10min [TU]

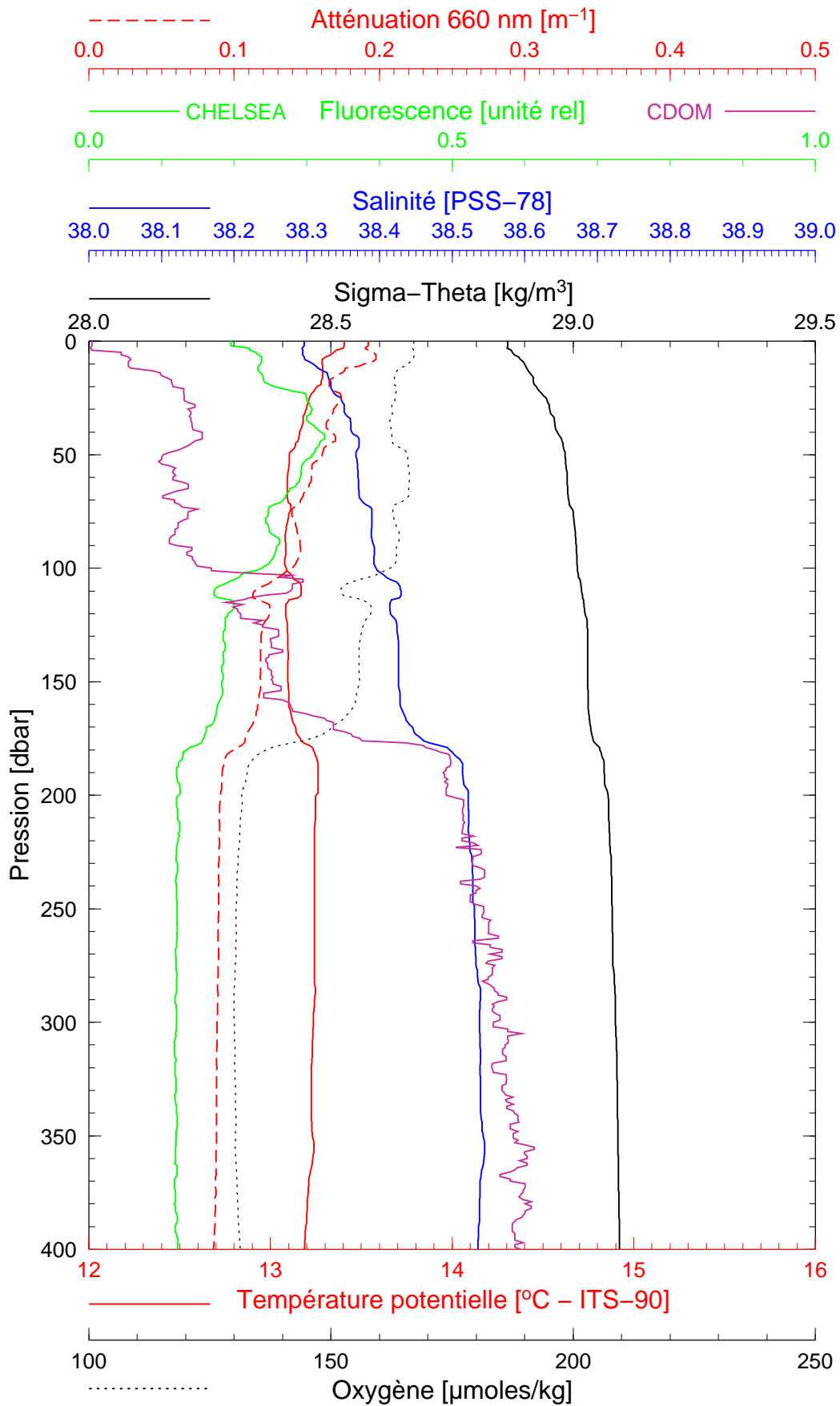
Latitude 43°21.935 N
Longitude 07°53.570 E

Boussole 61

23/02/2007

BOUS070223_02

BOUS003



Date 23/02/2007
Heure déb 12h 42min [TU]

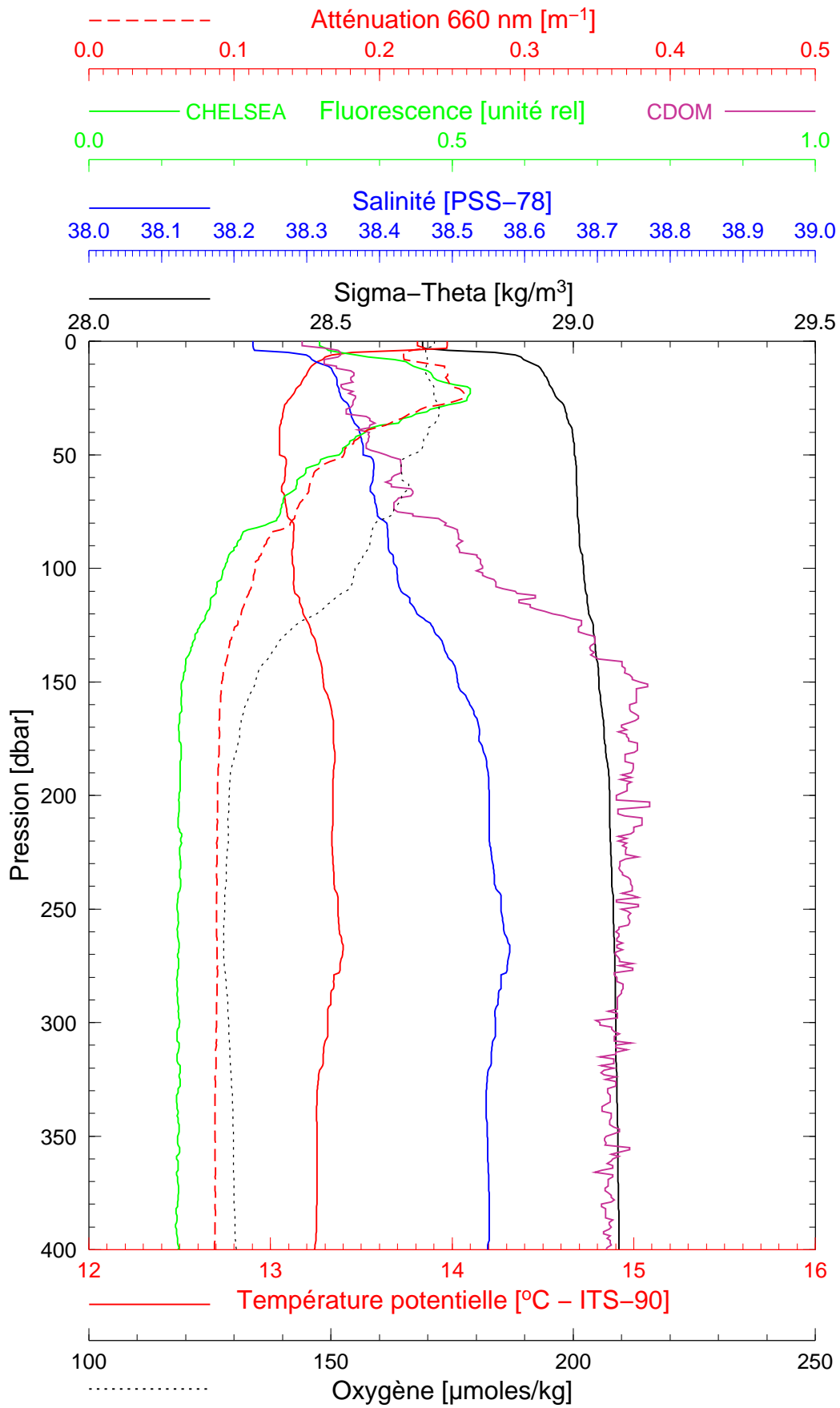
Latitude 43°24.990 N
Longitude 07°47.905 E

Boussole 61

23/02/2007

BOUS070223_03

BOUS004



Date 23/02/2007
Heure déb 13h 39min [TU]

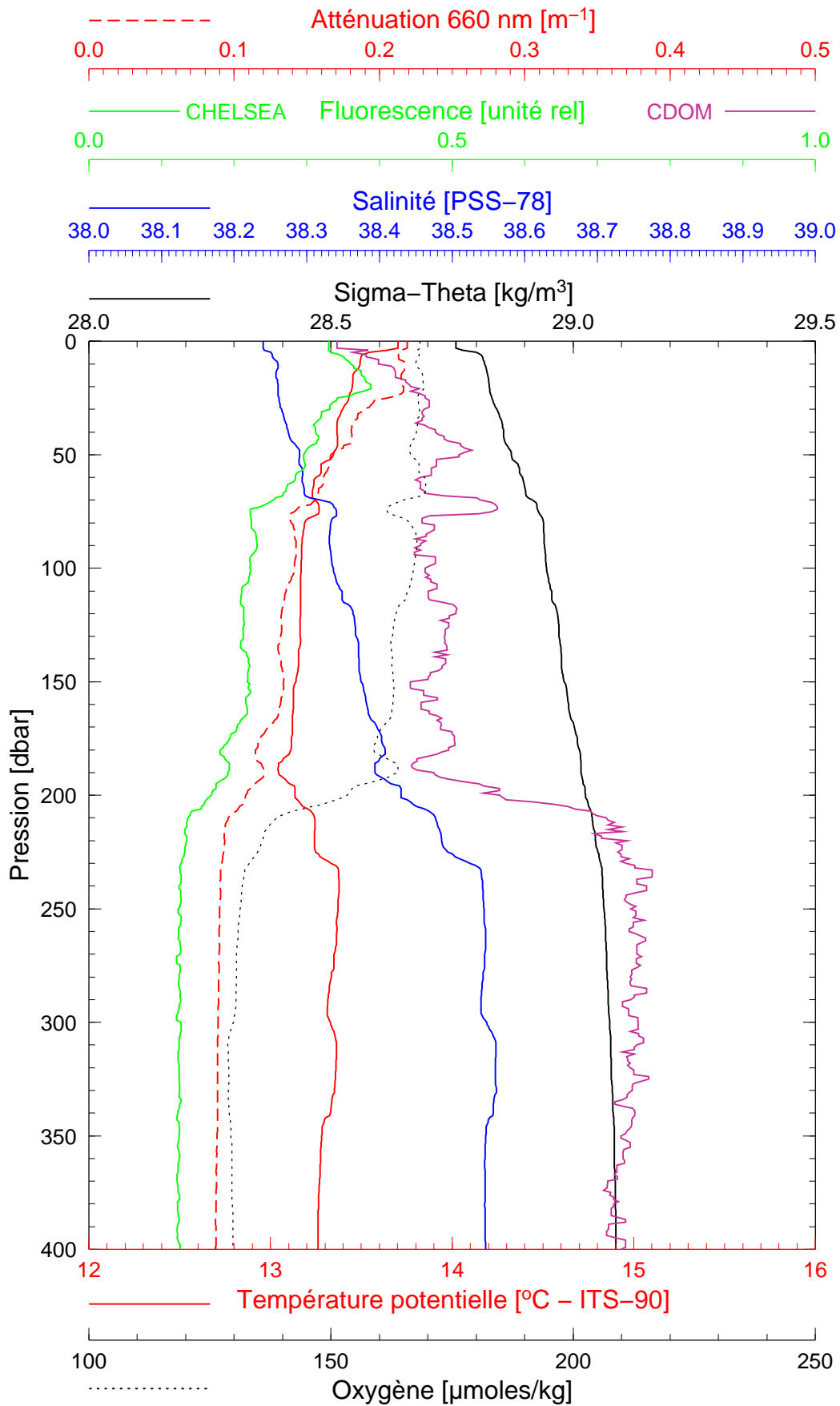
Latitude 43°27.940 N
Longitude 07°42.373 E

Boussole 61

23/02/2007

BOUS070223_04

BOUS005



Date 23/02/2007
Heure déb 14h 35min [TU]

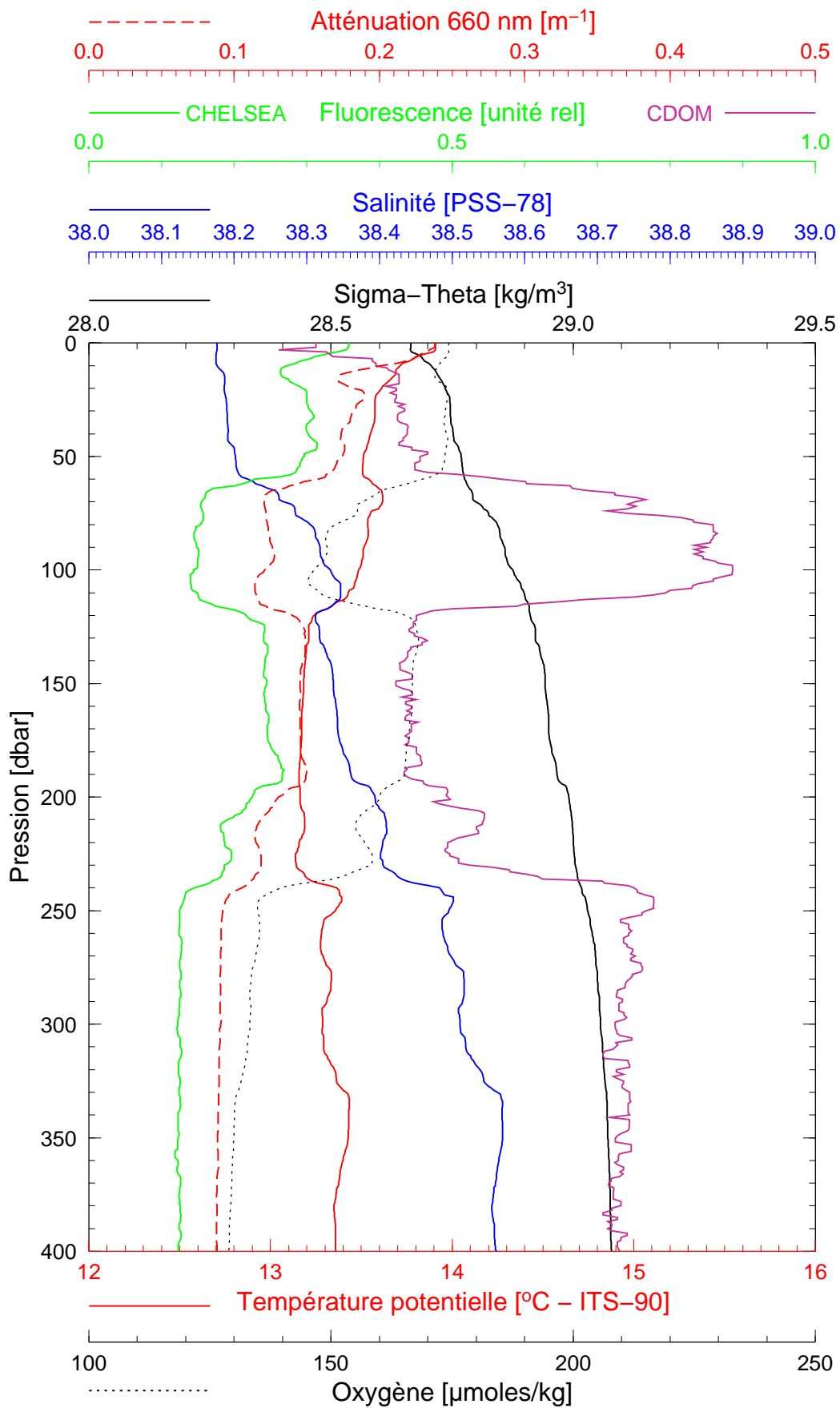
Latitude 43°30.938 N
Longitude 07°36.907 E

Boussole 61

23/02/2007

BOUS070223_05

BOUS006



Date 23/02/2007
Heure déb 15h 34min [TU]

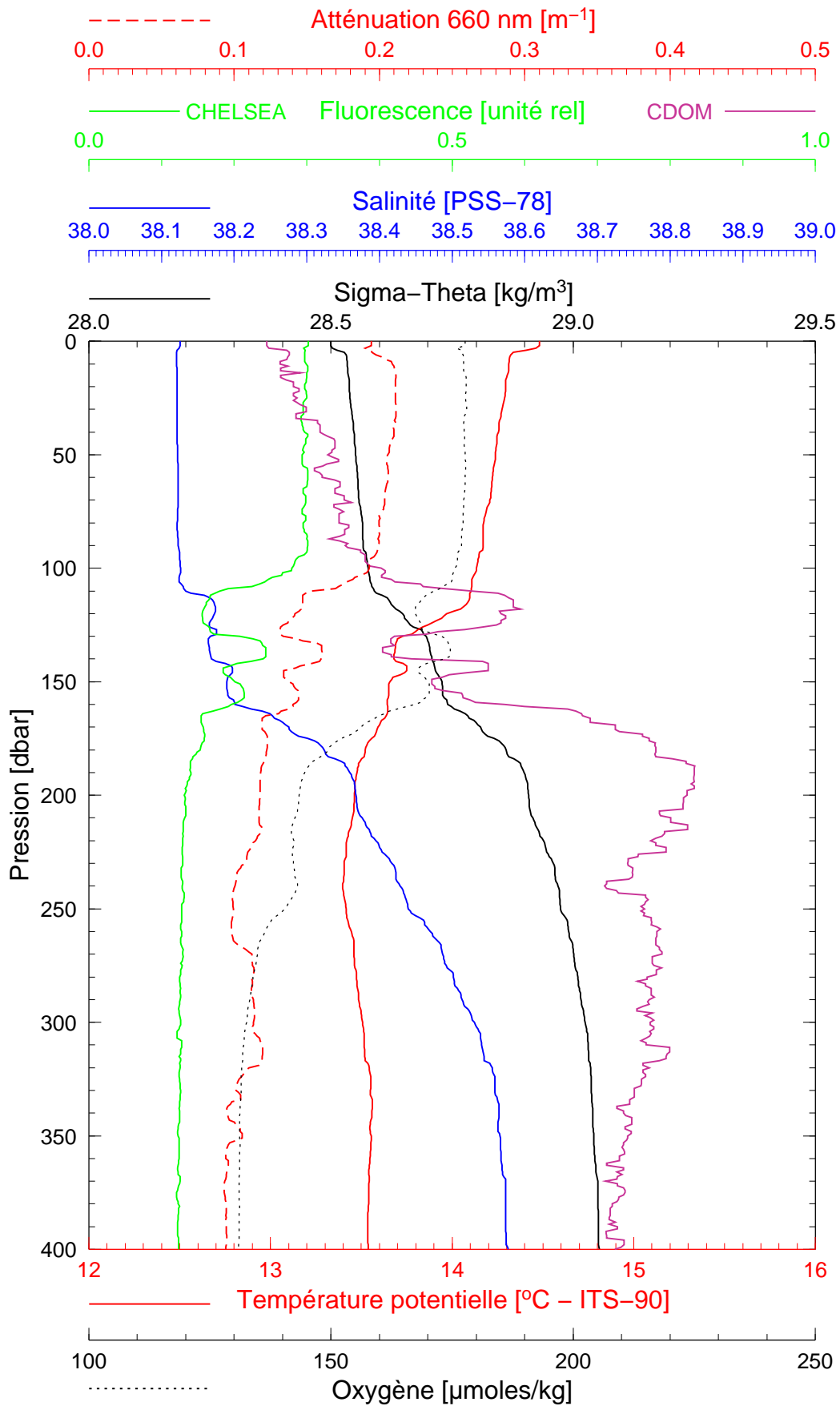
Latitude 43°33.943 N
Longitude 07°30.895 E

Boussole 61

23/02/2007

BOUS070223_06

BOUS007



Date 23/02/2007
Heure déb 16h 35min [TU]

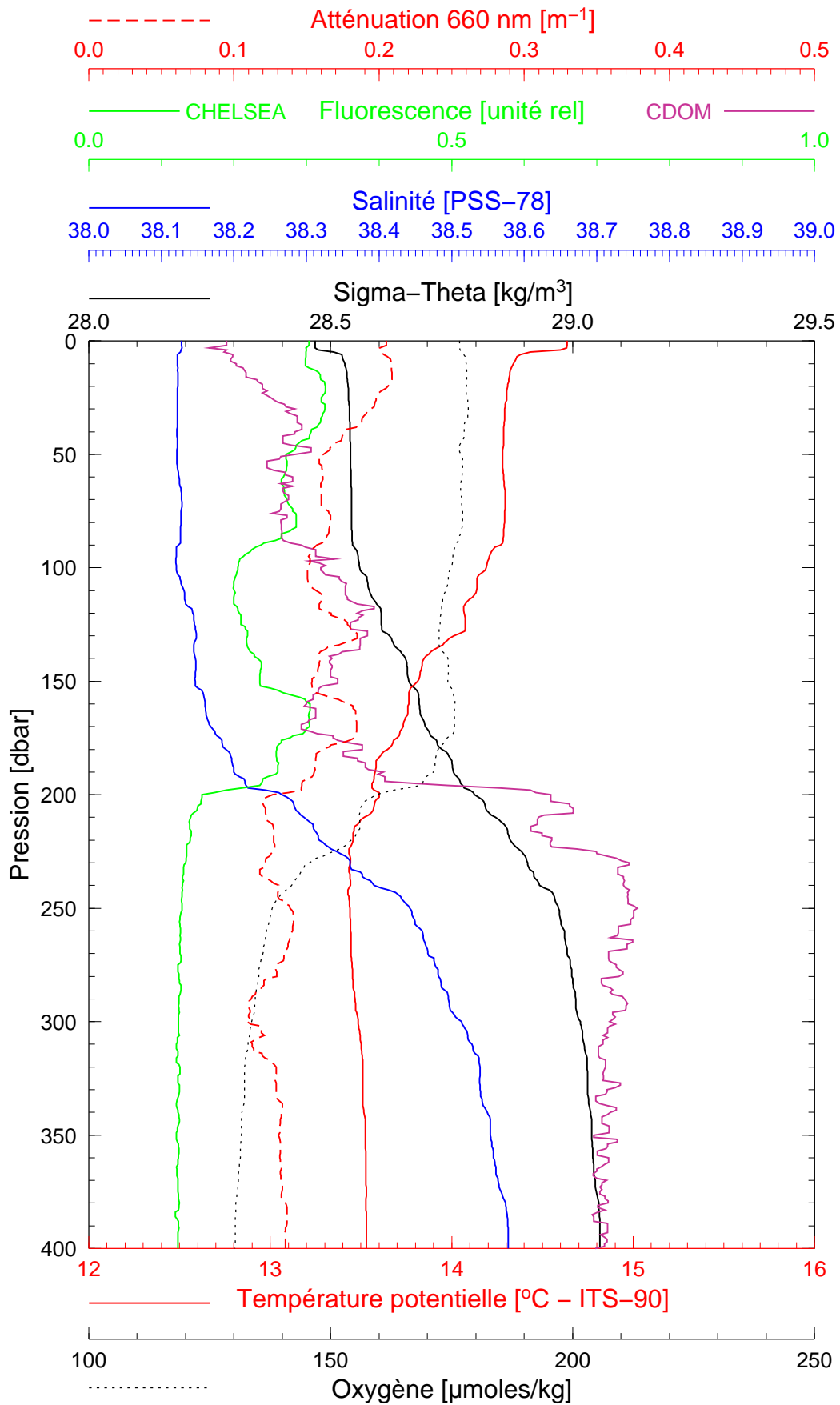
Latitude 43°37.450 N
Longitude 07°24.870 E

Boussole 61

23/02/2007

BOUS070223_07

BOUS008



Date 23/02/2007
Heure déb 17h 24min [TU]

Latitude 43°38.854 N
Longitude 07°20.647 E

BOUSSOLE 61 23 février 2007

