BOUSSOLE Monthly Cruise Report

Cruise 41
April 15 – 18, 2005

Duty Chief: Guislain Bécu (guislain.becu@obs-vlfr.fr)
Vessel: R/V Téthys II
(Captain: Alain Stépahn)

Science Personnel: Guislain Bécu, Dominique Tailliez, Edouard Leymarie, Nicolas Duval, Endre Marken and 3 divers (David Luquet, Jean de Vaugelas and Yves Lamblart)

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Fig 1. Typical water sample filters at 5, 10, 20, 30, 40, 50, 60, 70, 80, 100, 200 m (resp. from left to right).

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

December 2, 2005

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 of the USA

Centre National de la Recherche Scientifique, France

Institut National des Sciences de l'Univers, France

Université Pierre & Marie Curie, France

Observatoire Océanologique de Villefranche sur mer, France

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Cruise Objectives

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 N_2 for HPLC pigment and particule absorption spectrophotometric filter analysis 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.

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.

3 CNRS divers (David Luquet from LOV, Jean de Vaugelas from AquaScience/Université de Nice and Yves Lamblart from Nice (independent diver)) will be onboard on 15 April 2005 to take some pictures/movies and clean and check the buoy structure under the sea surface.

Edouard Leymarie will be present on 15 April to keep on training with all the operations and installations.

Nicolas Duval, trainee at LOV with David Antoine, will be onboard on from 15 to 18 April to give some help with water sampling from CTD profiles, Secchi measurements and CIMEL sun-photometer operation.

Endre Marken, trainee at LOV with David Antoine, will be onboard from 15 to 17 April to give some help with CTD water sampling and CIMEL sun-photometer operations.

Other activities will also be performed on the buoy to download the data off the buoy and verify that everything is as expected above the waterline.

Cruise Summary

CTD profiles were realized with LOV AC9+, as Bigelow AC9+ was returned to Collin Roesler (via WetLabs for calibration).

The PAROSCIENTIFIC pressure sensor was still unavailable (cf. BOUSSOLE #36 report); depth was again measured with a SBE39 hand held CTD fixed onto the SPMR body. But for the only 3 profiles that were realized (on 18 April), the CTD didn't work properly.

The Ultrapath operation was realized on 15 April. After some tests, Fanny Tièche didn't recommend any more to leave directly to the port of Nice when this operation is finished.

Friday 15 April 2005

The weather for the 15 April was rather good, especially in the morning. A strong wind period was forecasted for the afternoon (Beaufort scale 5 or 6), so that all the operations were realized a rapidly as possible (especially that the weather forecast was rather bad for the next days). The ship arrived in port of Nice only at 06h10 (local time), so that the equipment was boarded from 04h30 to 06h25 (local time), again to leave the port as soon as possible to avoid the forecasted strong wind in afternoon. The equipment was installed, buoy data were retrieved and Secchi disk measurements were realized while the divers were at sea, from 09h55 till 11h30 (local time).

After a CTD profile at 12h15 (local time), which was used for usual water samples filtration and UltraPath operations, the transect between BOUSSOLE site and port of Nice was undertaken (some CIMEL measurements were realized here and there during the day, at site and en route). The ship arrived at port of Nice at 19h (local time) ; the wind blows effectively at Beaufort 5 or 6, large whitehorses appeared, but the swell didn't rise.

Saturday 16 April 2005

Weather conditions prevented departure (H1/3 was 2.5 m).

Sunday 17 April 2005

Weather conditions prevented departure (H1/3 was 1.6 m).

Monday 18 April 2005

The last day was fully utilized for final buoy data retrieval, 2 CTD profiles plus quadrilateral (1 profile in common), 2 CIMEL measurements, and 3 SPMR/SMSR optical profiles (but the CTD did not log properly the depth data).

Cruise Report

15 April 2005 (UTC)

0435 Departure from port of Nice.
0755 Arrival at BOUSSOLE site. Divers at Sea to check the buoy structure under the surface, clean the sensors and take some pictures (until 0930).
1000 CIMEL measurement 1. Lat = 43°21.56' ; Lon = 7°53.42'.
1015 Buoy data retrieval.
1016 CTD profile 1 (400m) at BOUSSOLE site. Water sampling at 200, 100, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for usual onboard filtration (for HPLC at Lab) and for UltraPath experiment at Lab.
1030 Secchi disk measurement 1.
1035 CIMEL measurement 2. Lat = 43°22.00' ; Lon = 7°54.00'.
1102 CIMEL measurement 3. Lat = 43°24.10' ; Lon = 7°49.30'.
1127 CTD profile 2 (400m). Station 1 (43°25'N 7°48'E).
1128 CIMEL measurement 4. Lat = 43°24.80' ; Lon = 7°47.80'.
1140 Secchi disk measurement 2.
1220 CTD profile 3. Station 2 (43°28'N 7°42'E).
1226 CIMEL measurement 5. Lat = 43°27.80' ; Lon = 7°42.20'.
1320 CIMEL measurement 6. Lat = 43°30.90' ; Lon = 7°36.60'.
1322 CTD profile 4. Station 3 (43°31'N 7°37'E).
1415 CTD profile 5. Station 4 (43°34'N 7°31'E).
1514 CIMEL measurement 7. Lat = 43°37.50' ; Lon = 7°24.80'.
1524 CTD profile 6. Station 5 (43°37'N 7°25'E).
1700 Arrival at port of Nice.

16 April 2005

Bad weather prevented departure.

17 April 2005

Bad weather prevented departure.

18 April 2005

0430 Departure from port of Nice.
0750 Arrival at BOUSSOLE site.
0755 CTD profile 7 (400 m). Water sampling at 200, 100, 80, 70, 60, 40, 30, 20, 10 and 5 m for usual onboard filtration (for HPLC at Lab).
0815 Buoy data retrieval.
0842 SPMR/SMSR profiles 1, 2 and 3. Hand Held CTD did not log data!!!
0900 Secchi disk 2

1100 CTD profile 8 (400) with water sampling at 10 and 5 m (triplicate, sampled 1.5 l instead of 2.8 l, because filtrations were too long). This profile was realized at BOUSSOLE site, and took place of quadrilateral second profile, as the quadrilateral was undertaken just after this CTD profile.

1140 Quadrilateral started (the middle profile was swapped as the previous CTD profile was realized at the same place few minutes before).

1230 Quadrilateral finished, leaving for port of Nice.

1600 Arrival to port of Nice.

Calculated Swath paths for MERIS Sensor (ESOV Software)

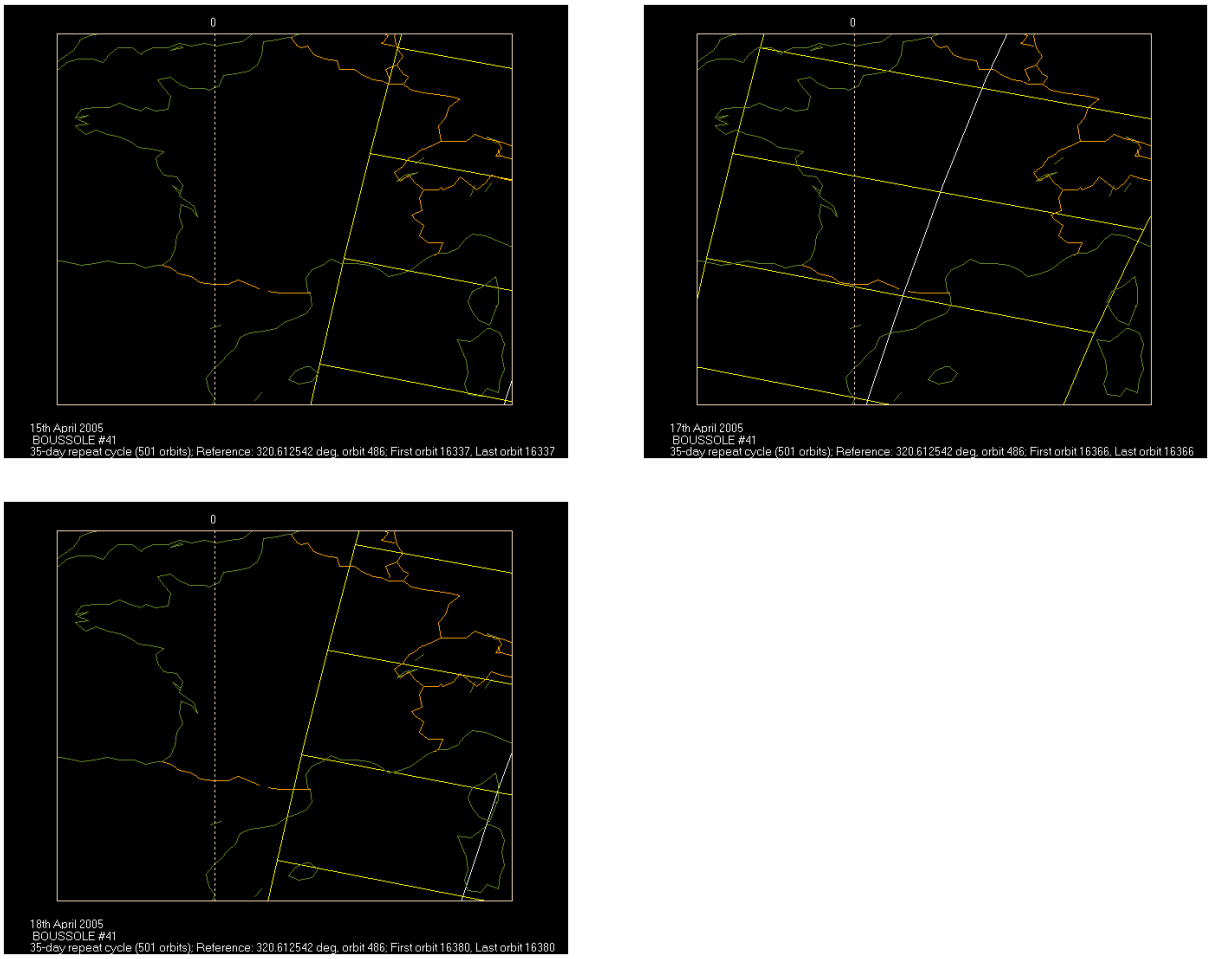
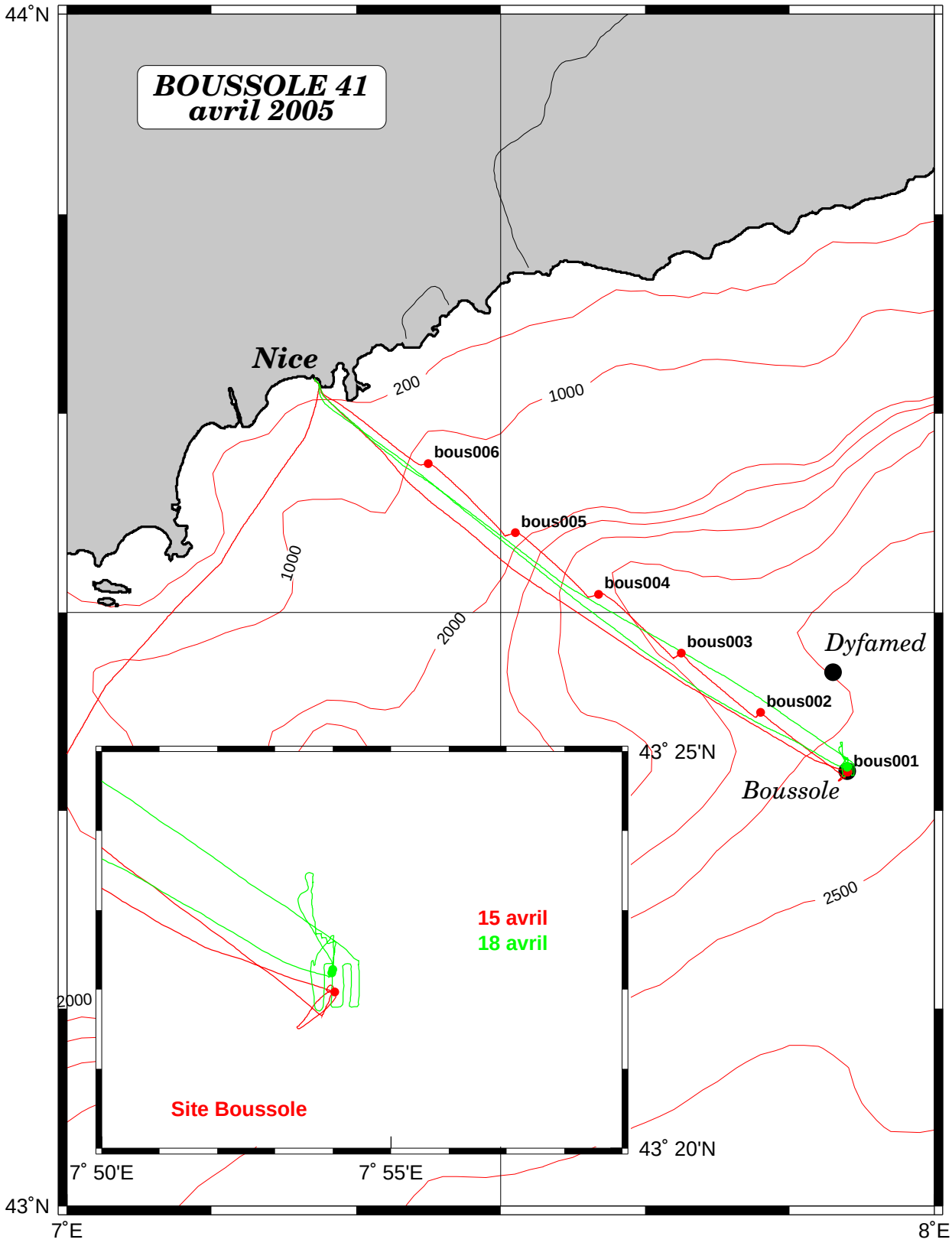


Figure 3. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for 15, 17 and 18 March 2005.

Appendix

Cruise Summary Table for Boussole 40

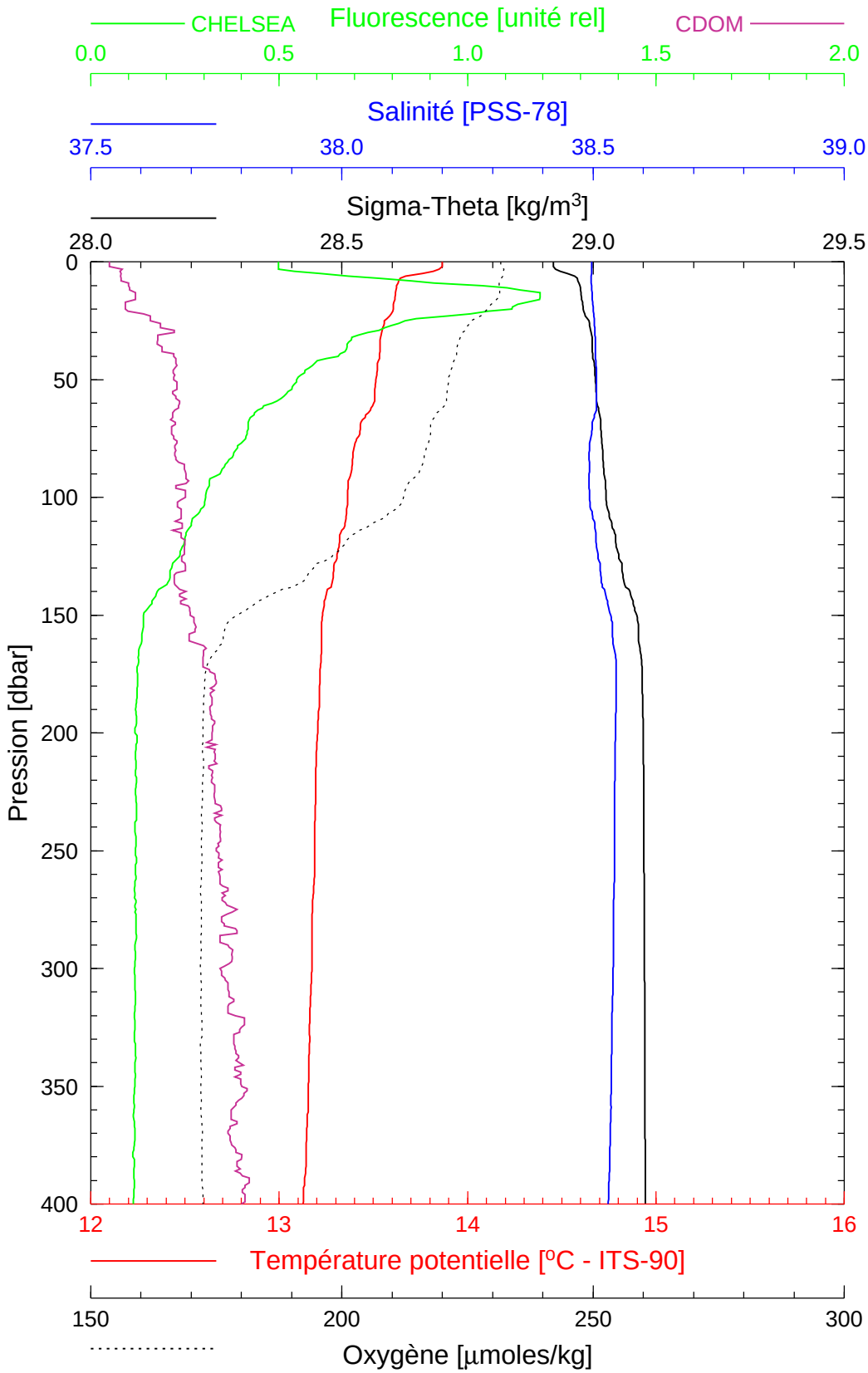
Date	Black names	Profile names	CTD notées /	Start Time	Duration	Depth max	Latitude (N)		longitude		Other sensors	Their cast	Start/Finish				Weather							Sea		
	(file ext: ".raw")	(file extension: ".raw")	satellite overpass	GMT (hour.min)	(min.sec)	(meter)	(Degree)	(Minute)	(Degree)	(Minute)				Sky	Clouds	Quantity (#/8)	Wind speed	Wind dir.	Atm. Pressure	humidity	Visibility	T air	T water	Sea	Swell height	Swell dir.	White horses
				10:00	05:00		43	21.560	7	53.420	CIMEL 1	Tau atmos.		clear	no	0											
			CTDBOUS001	10:16	27:00	400	43	21.968	7	54.026				clear	cu	2	10 kn	71	1010.2	85	good	14.1	13.9	calm	0,9 m		some
				10:30	02:00	8.7	43	22.000	7	54.000	Secchi disk 1	turbidity	10:32	clear	no	0											
				10:35	05:00		43	22.000	7	54.000	CIMEL 2	Tau atmos.	10:40	clear	ship fume ?	0											
				11:02	07:00		43	24.100	7	49.300	CIMEL 3	Tau atmos.	11:09	partial. Cloudy	Cu	1											
				11:28	05:00		43	24.800	7	47.800	CIMEL 4	Tau atmos.	11:33	variable Cu	Cu	2											
				11:40	02:00	5.5	43	24.858	7	47.823	Secchi disk 2	turbidity	11:42	variable Cu	Cu	3											
15/04/2005				12:26	08:00		43	27.800	7	42.200	CIMEL 5	Tau atmos.	12:34	cloudy	Cu	5											
				13:20	06:00		43	30.900	7	36.600	CIMEL 6	Tau atmos.	13:26	milky cloudy	Cu + fog	5											
				15:14	06:00		43	37.500	7	24.800	CIMEL 7	Tau atmos.	15:20	milky cloudy	Cu + fog	5											
			CTDBOUS002	11:27	24:00	400	43	24.978	7	47.985				cloudy	Cu + fog	3	12 kn	66	1009.9	85	good	14.2	14.0	calm	0,9 m		some
			CTDBOUS003	12:20	28:00	400	43	27.967	7	42.504				cloudy	Cu + fog	4	17 kn	76	1009.6	86	good	14.5	14.0	calm	0,9 m		some
			CTDBOUS004	13:22	24:00	400	43	30.918	7	36.790				cloudy	Cu + fog	4	14 kn	85	1009.1	86	good	14.5	13.9	choppy	0,9 m		some
			CTDBOUS005	14:15	26:00	400	43	34.012	7	31.007				cloudy	Cu + fog	3	15 kn	91	1008.3	87	good	14.5	13.7	choppy	0,9 m		some
			CTDBOUS006	15:24	22:00	400	43	37.494	7	24.998				cloudy	Cu + fog	4	16 kn	73	1007.4	85	good	14.0	14.1	choppy	1,0 m		yes
16/04/2005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17/04/2005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			CTDBOUS007	07:55	27:00	400	43	22.210	7	53.978				slight cover	Cu + far Ci	4	6 kn	196	1002.1	64	excellent	12.3	13.7	long swell	1,1 m		no
	bou180405black1			08:28	03:00																						
		bou180405A		08:42	05:00	200	43	22.592	7	53.900				slight cover	Cu + far Ci	3	2 kn	114	1002.7	59	excellent	13.9		long swell	1,1 m		no
		bou180405B		08:54	04:45	200	43	22.658	7	53.827				slight cover	Cu + far Ci	4	2 kn	114	1002.7	59	excellent	13.9		long swell	1,1 m		no
18/04/2005		bou180405C		09:05	03:20	120	43	22.710	7	53.750				slight cover	Cu + far Ci	4	2 kn	114	1002.7	59	excellent	13.9		long swell	1,1 m		no
	bou180405black2			09:18	03:00																						
			CTDBOUS008	10:59	24:00	400	43	22.258	7	53.996				slight cover	Cu + far Ci	5	9 kn	180	1002.3	68	excellent	13.6	13.9	long swell	1,1 m		no
			CTDQ001	11:40	05:00	10	43	22.307	7	53.668				slight cover	Cu + far Ci	-	-	-	-	-	-	-	-	-	-	-	-
			CTDQ002	12:05	05:00	10	43	22.315	7	54.339				slight cover	Cu + far Ci	-	-	-	-	-	-	-	-	-	-	-	-



GMT 2005 Apr 18 17:34:08

Boussole 41 **15/04/2005** **BOUS050415_01**

BOUS001

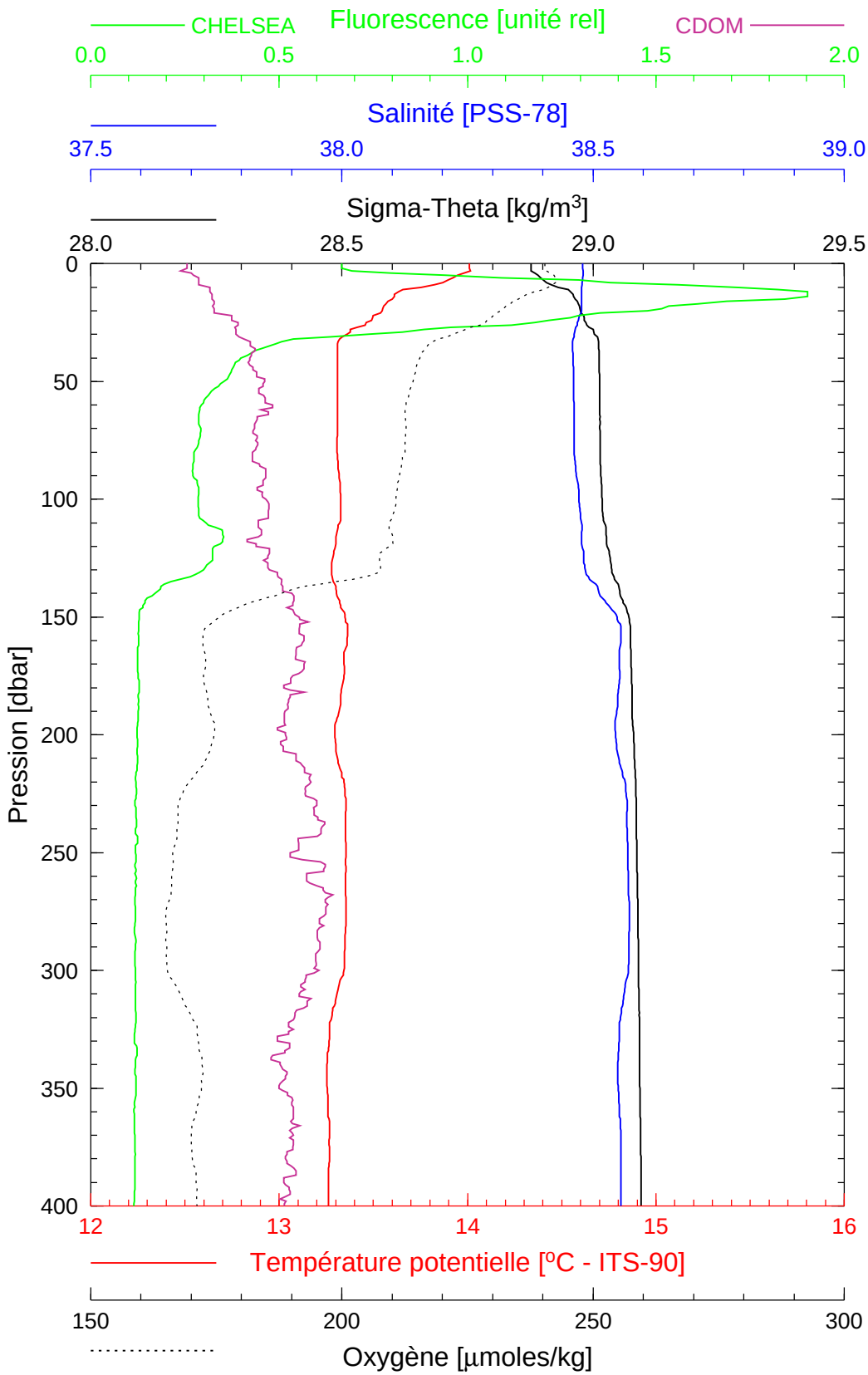


Date *15/04/2005* *Latitude* *43º21.968 N*

Heure déb *10h 16min [TU]* *Longitude* *07º54.026 E*

Boussole 41 **15/04/2005** **BOUS050415_02**

BOUS002

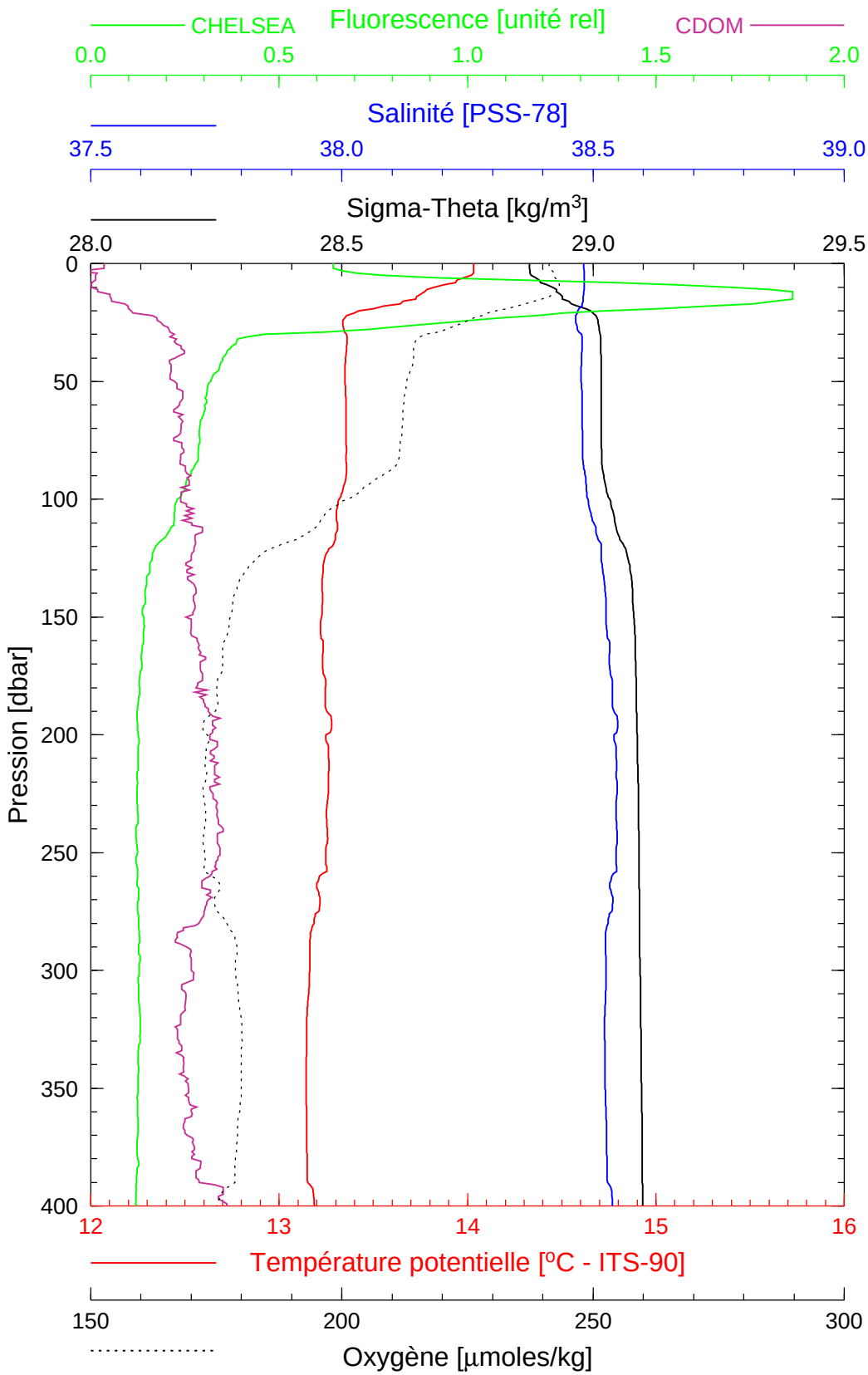


Date *15/04/2005* *Latitude* *43º24.978 N*

Heure déb *11h 27min [TU]* *Longitude* *07º47.985 E*

Boussole 41 **15/04/2005** **BOUS050415_03**

BOUS003

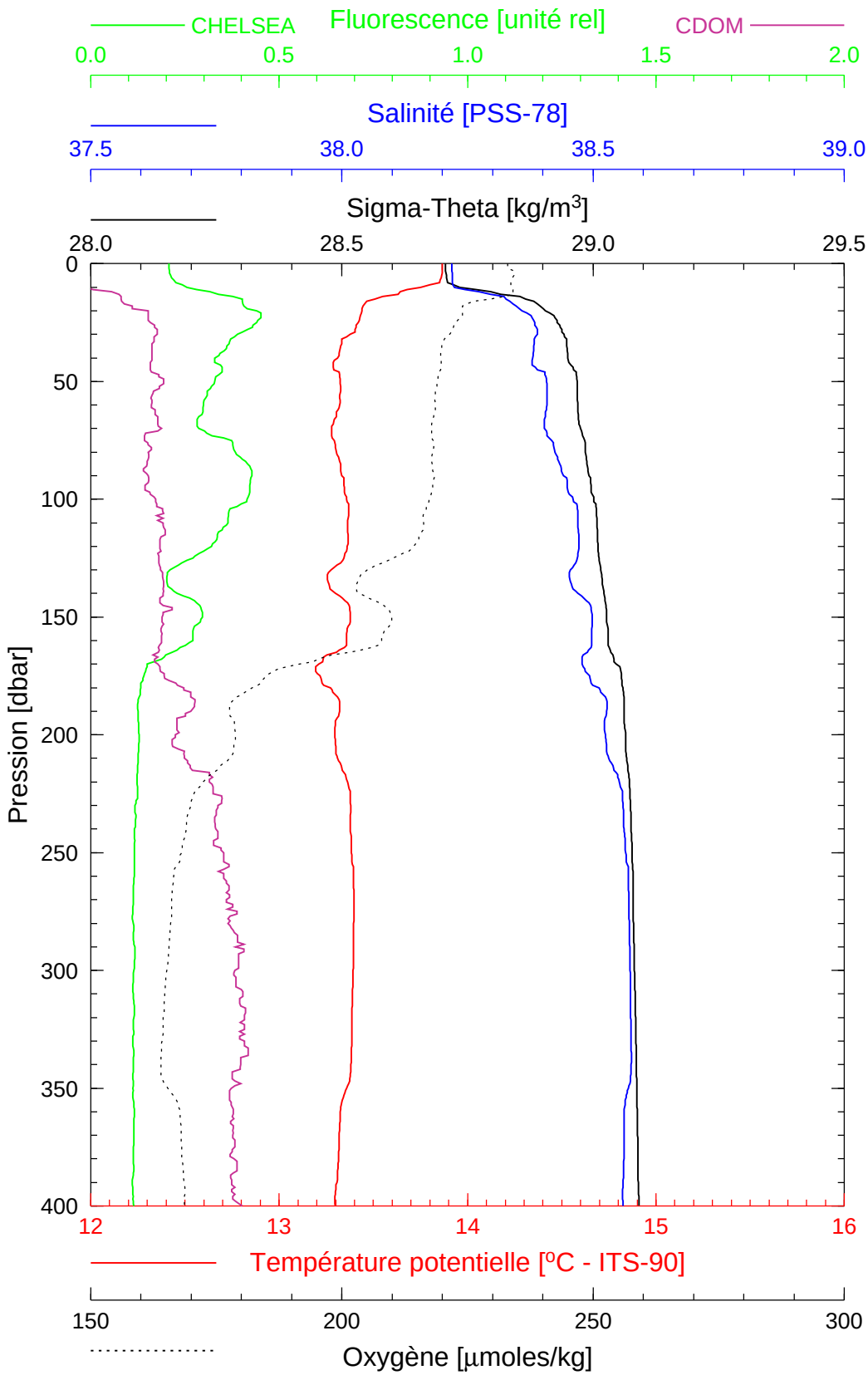


Date *15/04/2005* *Latitude* *43º27.967 N*

Heure déb *12h 26min [TU]* *Longitude* *07º42.504 E*

Boussole 41 **15/04/2005** **BOUS050415_04**

BOUS004

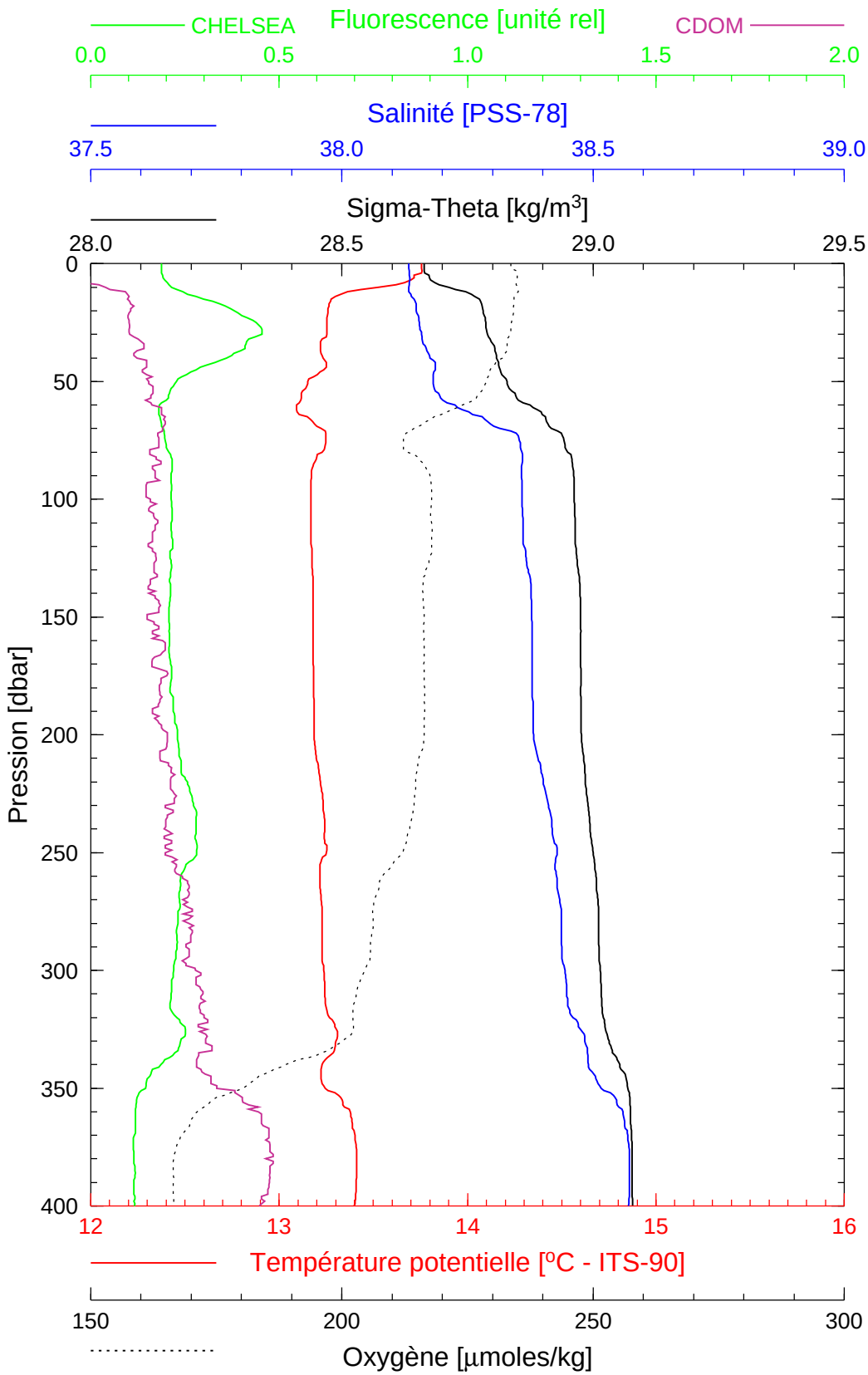


Date *15/04/2005* *Latitude* *43º30.918 N*

Heure déb *13h 25min [TU]* *Longitude* *07º36.790 E*

Boussole 41 **15/04/2005** **BOUS050415_05**

BOUS005

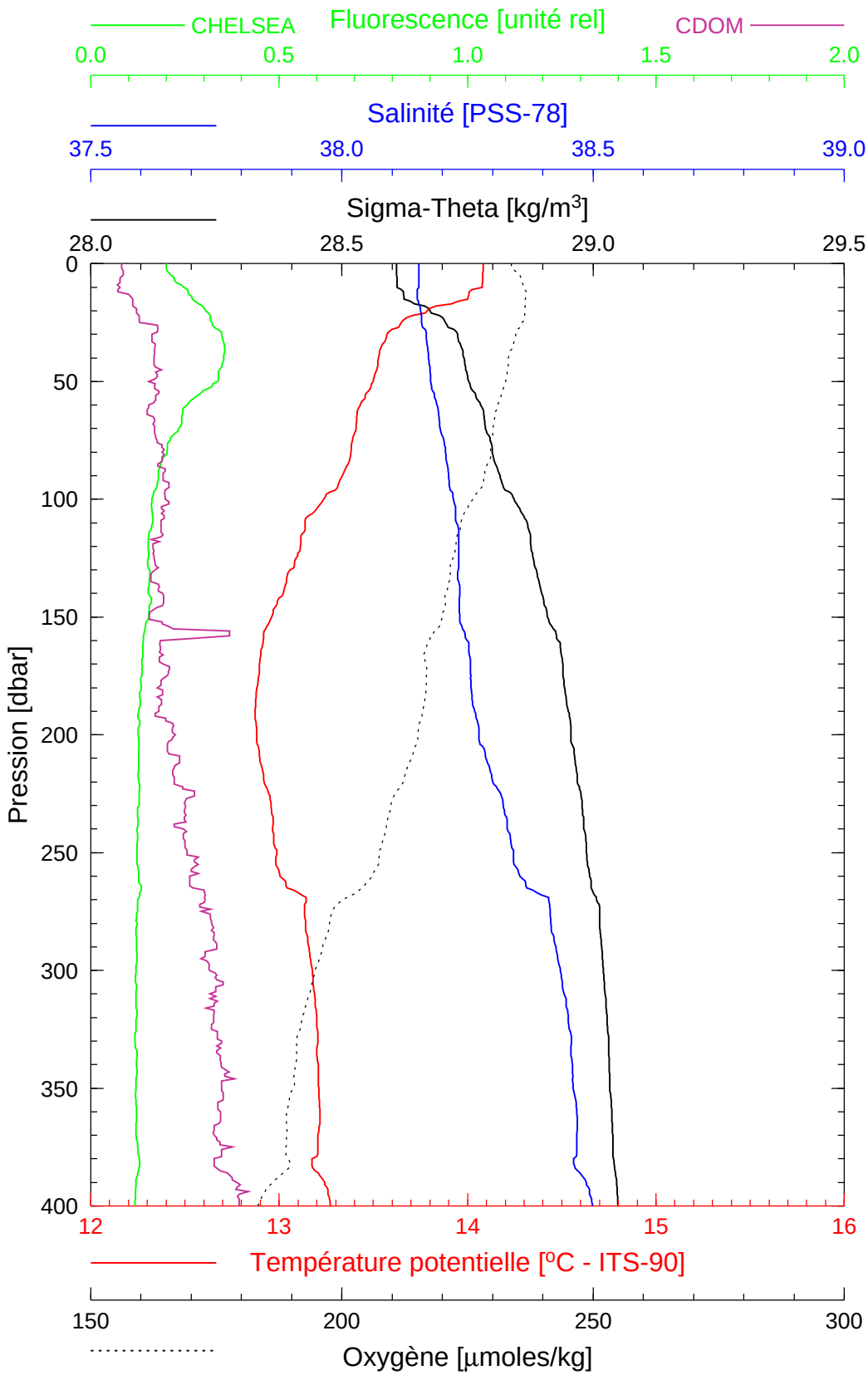


Date *15/04/2005* *Latitude* *43º34.012 N*

Heure déb *14h 18min [TU]* *Longitude* *07º31.007 E*

Boussole 41 **15/04/2005** **BOUS050415_06**

BOUS006

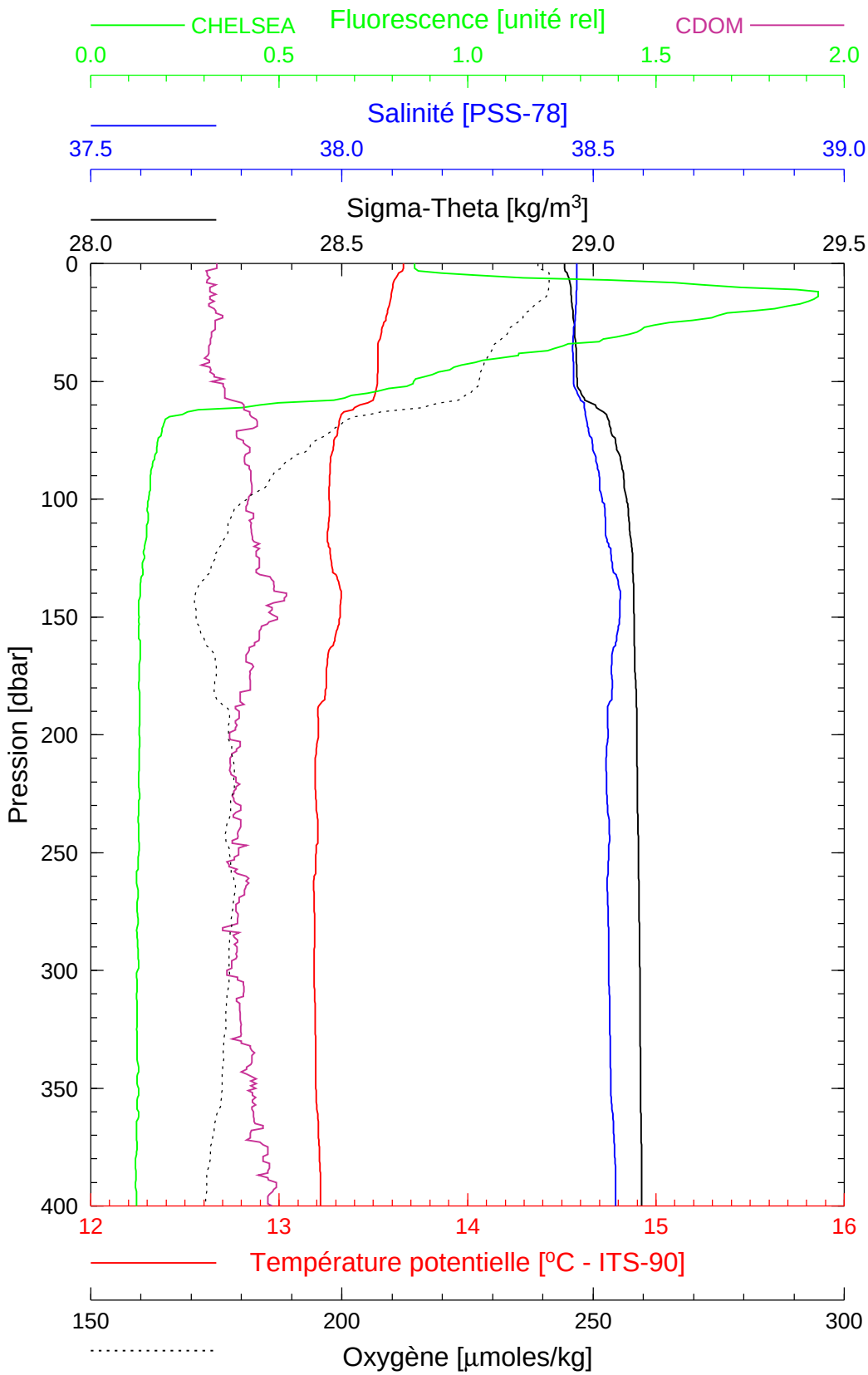


Date *15/04/2005* *Latitude* *43º37.494 N*

Heure déb *15h 15min [TU]* *Longitude* *07º24.998 E*

Boussole 41 **18/04/2005** **BOUS050418_01**

BOUS007

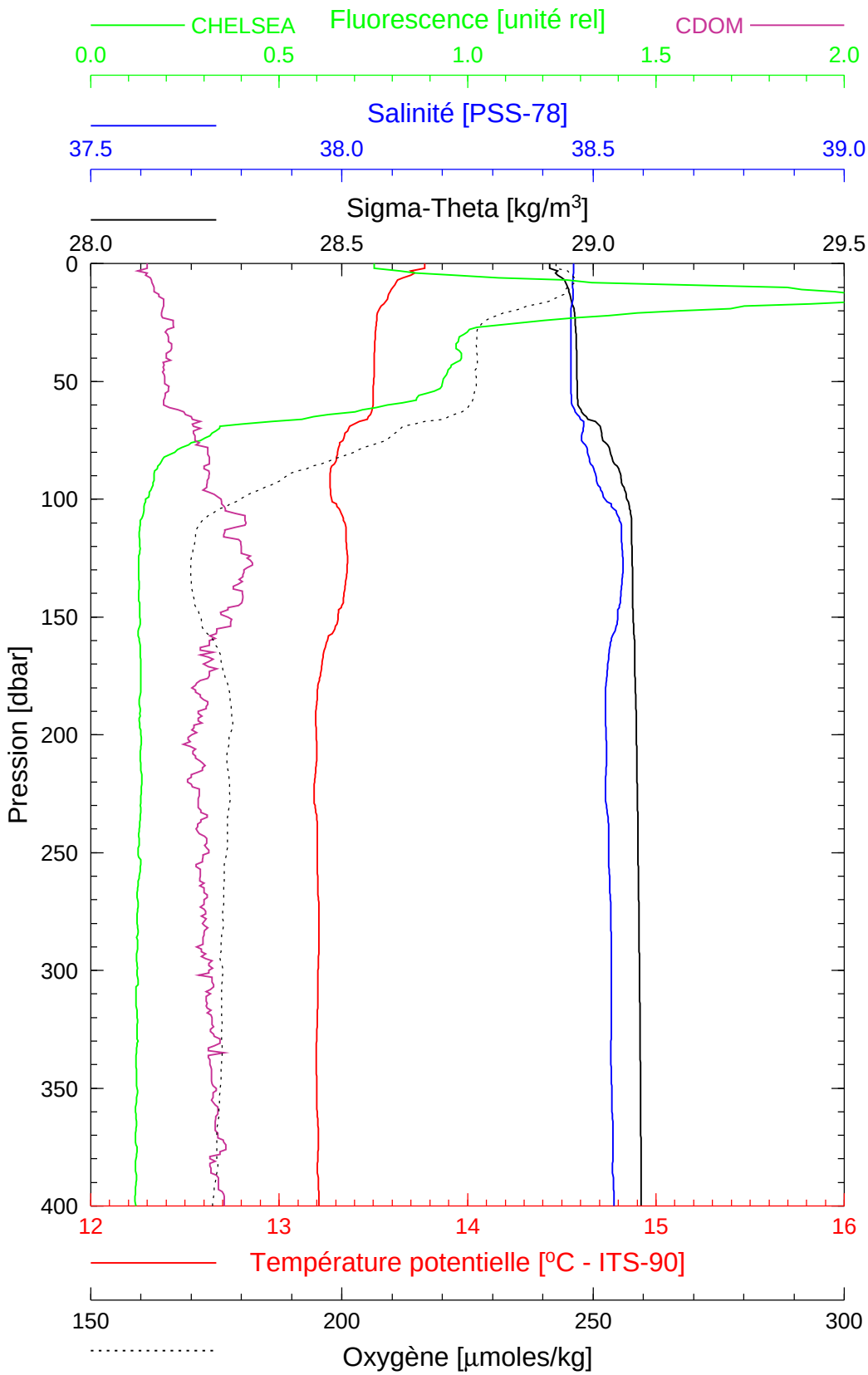


Date *18/04/2005* *Latitude* *43º22.210 N*

Heure déb *07h 55min [TU]* *Longitude* *07º53.978 E*

Boussole 41 **18/04/2005** **BOUS050418_02**

BOUS008



Date *18/04/2005* *Latitude* *43º22.258 N*

Heure déb *10h 59min [TU]* *Longitude* *07º53.996 E*