BOUSSOLE Monthly Cruise Report

Cruise 44
July 27 – 29, 2005

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

Science Personnel: Guislain Bécu, Dominique Tailliez, Fanny Tièche and 3 divers (David Luquet, Laurent Giletta and Yves Lamblart)

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

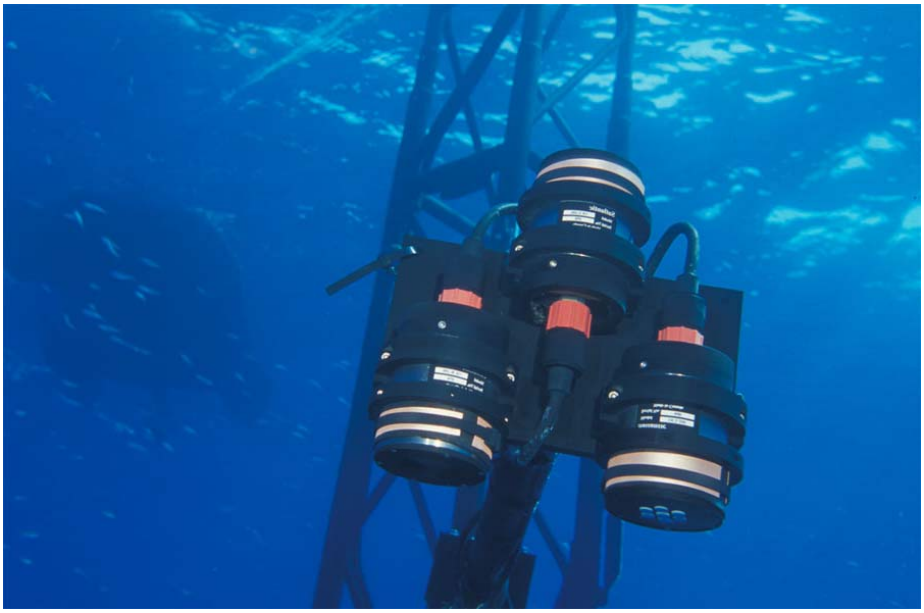


Fig 1. Buoy rads are equipped with copper sheets near detectors, to prevent bio-fouling contamination.

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

Contents

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, Laurent Giletta and Yves Lamblart) will be onboard on 28 July 2005 to take some pictures and clean and check the buoy structure under the sea surface.

Fanny Tièche will be present on 28 July for the Ultra Path water sampling/filtration and for another set of filtration.

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

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.

Sea conditions were excellent for the 3 days, optics conditions were good for the first and second days, with nevertheless a constant but small amount of haze, but were fair for the last day (heterogeneous clouds).

A new 4000 meters electric cable for the CTD deployment was installed on the ship. Nevertheless, The crew had to cut about 200 meters, as the cable was too long to stay securely on the whinch. Dominique Tailliez reconnected that cable properly.

Wednesday 27 July 2005

Weather for this day was very good, the sea was quite flat, and the sky was quite blue, with a little amount of haze (white on horizon), but very stable for optic operations. 3 SPMR/SMSR profiles with pyramidal floating system, 1 Secchi disk measurement, 1 CIMEL atmospheric measurement, 2 CTD at BOUSSOLE site and 5 CTD at stations 1 to 5 of the radial were realized.

Thursday 28 July 2005

Weather was also very good, while not so good than the previous day (the sky was more milky, and the Sea less flat). Divers went twice at Sea, the first one to clean the sensor (symbolic as they were very clean) and take some pictures of them, and the second to try to take some air/sea pictures of the CTD deployment near the buoy. Unfortunately, at that moment, the Sea was a little bit choppy and that kind of picture was impossible. Other

measurements realized that day were 2 CTD profiles, 3 SPMR/SMSR profiles with pyramidal floating system and 3 CIMEL shots.

Friday 29 July 2005

Sky conditions were poor and unstable that day. The sky was white and diffuse at morning (sun was hidden), and large gray clouds appeared in the afternoon. Sea conditions were good.Only 2 CTD profiles were realized that day.

Cruise Report

27 July 2005 (UTC)

0630 Departure from port of Nice.
0955 CTD 1 with water sampling at 200, 100, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters.
1215 Buoy data uploading.
1255 SPMR/SMSR profiling with pyramid buoy.
1440 Secchi disk 1.
1457 CIMEL measurement 1.
1501 CTD 2 with water sampling at 10 and 5 meters.
1608 CTD 3 at station 1 (43°25'N 07°48'E).
1712 CTD 4 at station 2 (43°28'N 07°42'E).
1811 CTD 5 at station 3 (43°31'N 07°37'E).
1914 CTD 6 at station 4 (43°34'N 07°31'E).
2020 CTD 7 at station 5 (43°37'N 07°25'E).
2150 Arrival at port of Nice.

28 July 2005

0500 Departure from port of Nice.
0830 Diving operation 1 (sensor cleaning and sub-surface pictures).
0910 CTD 8 with water sampling at 200, 100, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters (for UltraPath also).
0925 CIMEL measurement 2.
1008 CIMEL measurement 3.
1035 Secchi disk 2.
1053 CIMEL measurement 4.
1100 Diving operation 2 (air/sea pictures of the CTD).
1213 SPMR/SMSR profile with pyramid buoy.
1345 Electric cable connection after 200 meters cut.
1458 CIMEL measurement 5.
1525 CTD 9 with water sampling at 5 and 10 meters (triplicates).
1930 Arrival at port of Nice.

29 July 2005

0430 Departure from port of Nice.
0802 CTD 10 with water sampling at 200, 100, 80, 70, 60, 50, 40, 30, 20, 10 and 5 meters.
1114 CTD 11 with water sampling at 5 and 10 meters (triplicates).
1500 Arrival at port of Nice.

Calculated Swath paths for MERIS Sensor (ESOV Software)

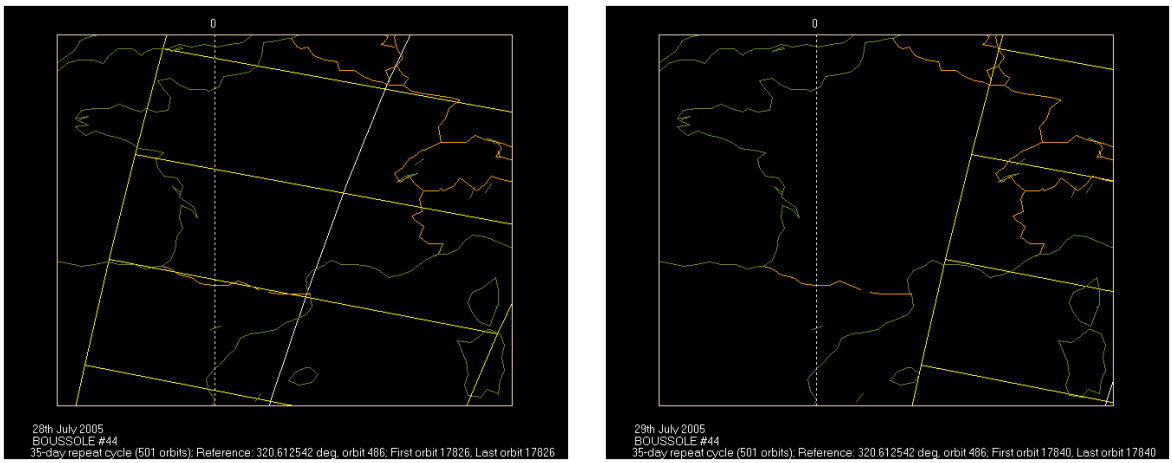
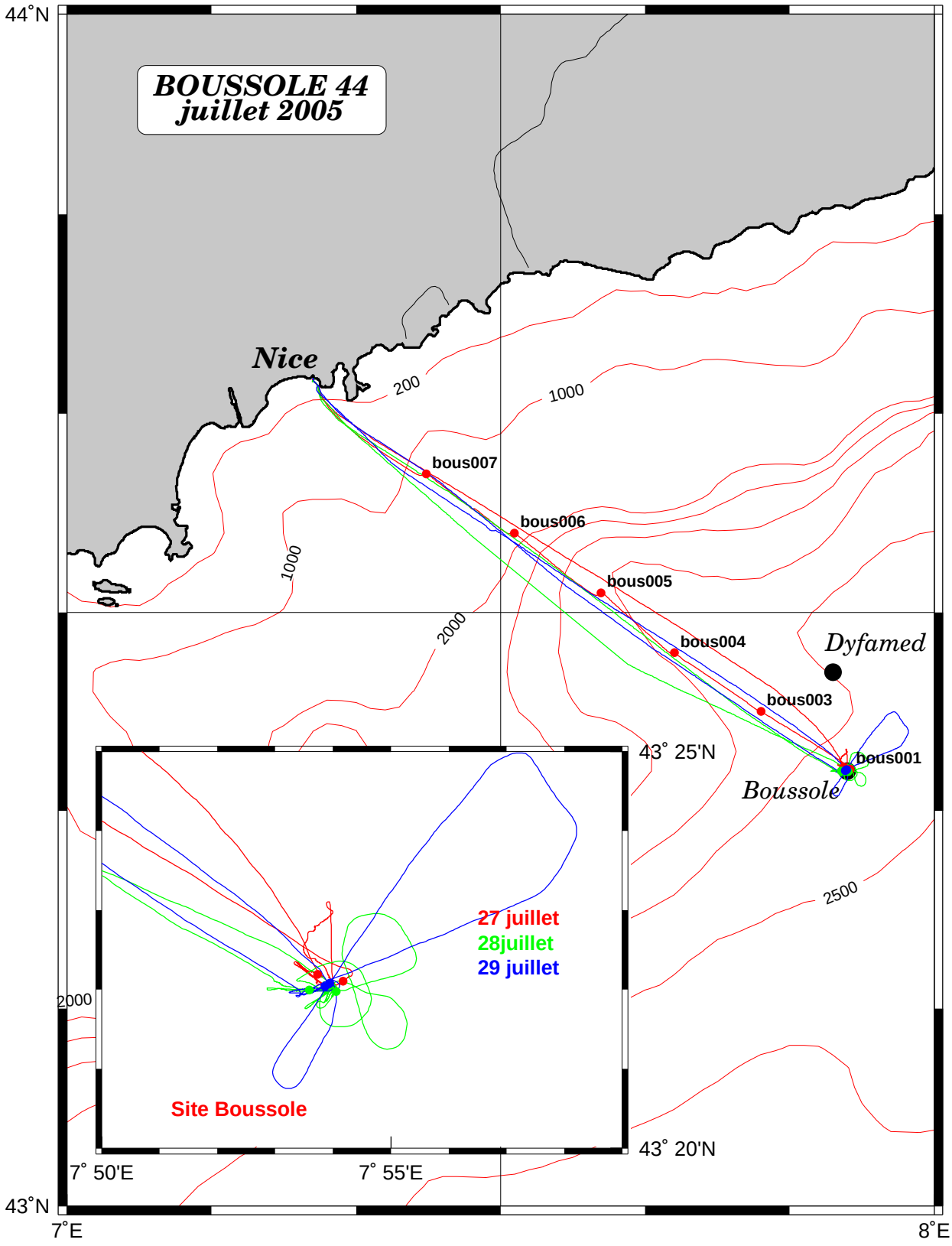


Figure 3. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for 28 and 29 July 2005.

Appendix

Cruise Summary Table for Boussole 43

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
27/07/2005			CTDBOUS001	09:57	31:00	400	43	22.196	7	53.733				slightly milky	no	0	7 kn	78	1014.8	84	very good	24.7	24.3	flat	0,3 m		no
	bou270705black1			10:16	03:00																						
		bou270705spmratsurfaceA		12:55	10:00	230	43	22.333	7	53.781				slightly milky	no	0	3 kn	57	1014.7	81	very good	25.2		flat	0,3 m		no
		bou270705spmratsurfaceB		13:25	08:00	0	43	22.667	7	53.566				slightly milky	no	0	3 kn	57	1014.7	81	very good	25.2		flat	0,3 m		no
		bou270705spmratsurfaceC		13:34	05:00	230	43	22.667	7	53.566				slightly milky	no	0	3 kn	57	1014.7	81	very good	25.2		flat	0,3 m		no
		bou270705spmratsurfaceD		13:52	09:00	230	43	22.810	7	53.742				slightly milky	no	0	3 kn	57	1014.7	81	very good	25.2		flat	0,3 m		no
	bou270705black2			14:17	03:00																						
				14:40	02:00		43	22.000	7	54.000	Secchi 1	turbidity															
				14:57	05:00		43	22.000	7	54.000	CIMEL 1	Tau atmos.		slightly milky	no	0											
			CTDBOUS002	15:01	27:00	400	43	22.106	7	54.175				slightly milky	no	0	3 kn	13	1014.2	83	very good	25.1	25.3	flat	0,3 m		no
			CTDBOUS003	16:08	26:00	400	43	25.008	7	48.024				slightly milky	no	0	3 kn	356	1014.0	81	very good	25.5	24.5	flat	0,3 m		no
			CTDBOUS004	17:12	23:00	400	43	27.984	7	42.021				slightly milky	no	0	2 kn	359	1013.8	78	very good	26.1	24.7	flat	0,3 m		no
			CTDBOUS005	18:11	33:00	400	43	30.993	7	36.963				slightly milky	no	0	2 kn	285	1013.3	76	very good	26.2	25.5	flat	0,3 m		no
			CTDBOUS006	19:14	26:00	400	43	33.997	7	30.948				slightly milky	no	0	1 kn	283	1014.1	79	very good	25.6	25.3	flat	0,3 m		no
			CTDBOUS007	20:20	27:00	400	43	36.997	7	24.862				slightly milky	no	0	1 kn	171	1014.5	76	very good	25.4	25.5	flat	0,3 m		no
28/07/2005			CTDBOUS008	09:14	28:00	400	43	21.980	7	54.058				milky	no	0	10 kn	55	1015.9	87	very good	25.3	24.9	calm	0,4 m		no
				09:25	05:00		43	22.000	7	54.000	CIMEL 2	Tau atmos.		milky	no	0											
				10:08	05:00		43	22.000	7	54.000	CIMEL 3	Tau atmos.		milky	no	0											
				10:35	02:00		43	22.000	7	54.000	Secchi 2	turbidity		milky	no												
				10:53	05:00		43	22.000	7	54.000	CIMEL 4	Tau atmos.		milky	no	0											
	bou280705black1			12:13	03:00																						
		bou280705spmratsurfaceA		12:37	10:00	230	43	21.986	7	53.866				milky	no	0	8 kn	72	1015.3	84	very good	25.9		calm	0,5 m		no
		bou280705spmratsurfaceB		13:05	07:51	200	43	22.012	7	53.103				milky	no	0	8 kn	72	1015.3	84	very good	25.9		calm	0,5 m		no
		bou280705spmratsurfaceC		13:36	07:09	200	43	22.023	7	53.799				milky	no	0	8 kn	72	1015.3	84	very good	25.9		calm	0,5 m		no
	bou280705black2			13:54	03:00																						
			CTDBOUS009	15:25	29:00	400	43	21.997	7	53.591				milky	no	0	4 kn	88	1015.3	79	very good	27.2	25.3	calm	0,5 m		no
29/07/2005			CTDBOUS010	08:02	30:00	400	43	22.080	7	53.945				covered	Cu	7	12 kn	53	1014.4	75	good	26.4	24.9	choppy	0,6 m		some
			CTDBOUS011	11:14	28:00	400	43	22.042	7	53.857				covered	Cu	8	9 kn	331	1015	83	good	25.6	24.9	calm	0,5 m		rare



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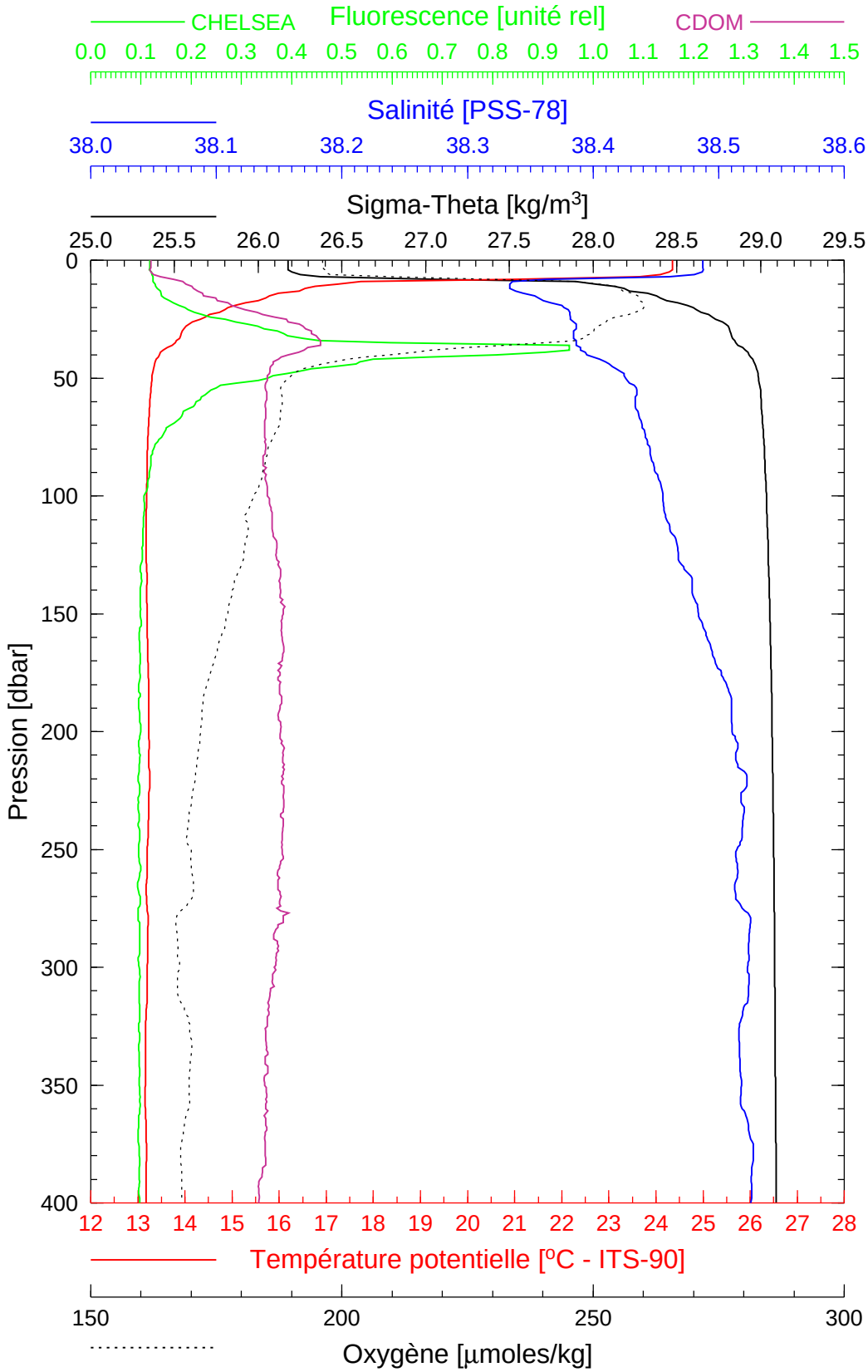
BOUS001



Date *27/07/2005* *Latitude* *43°22.196 N*

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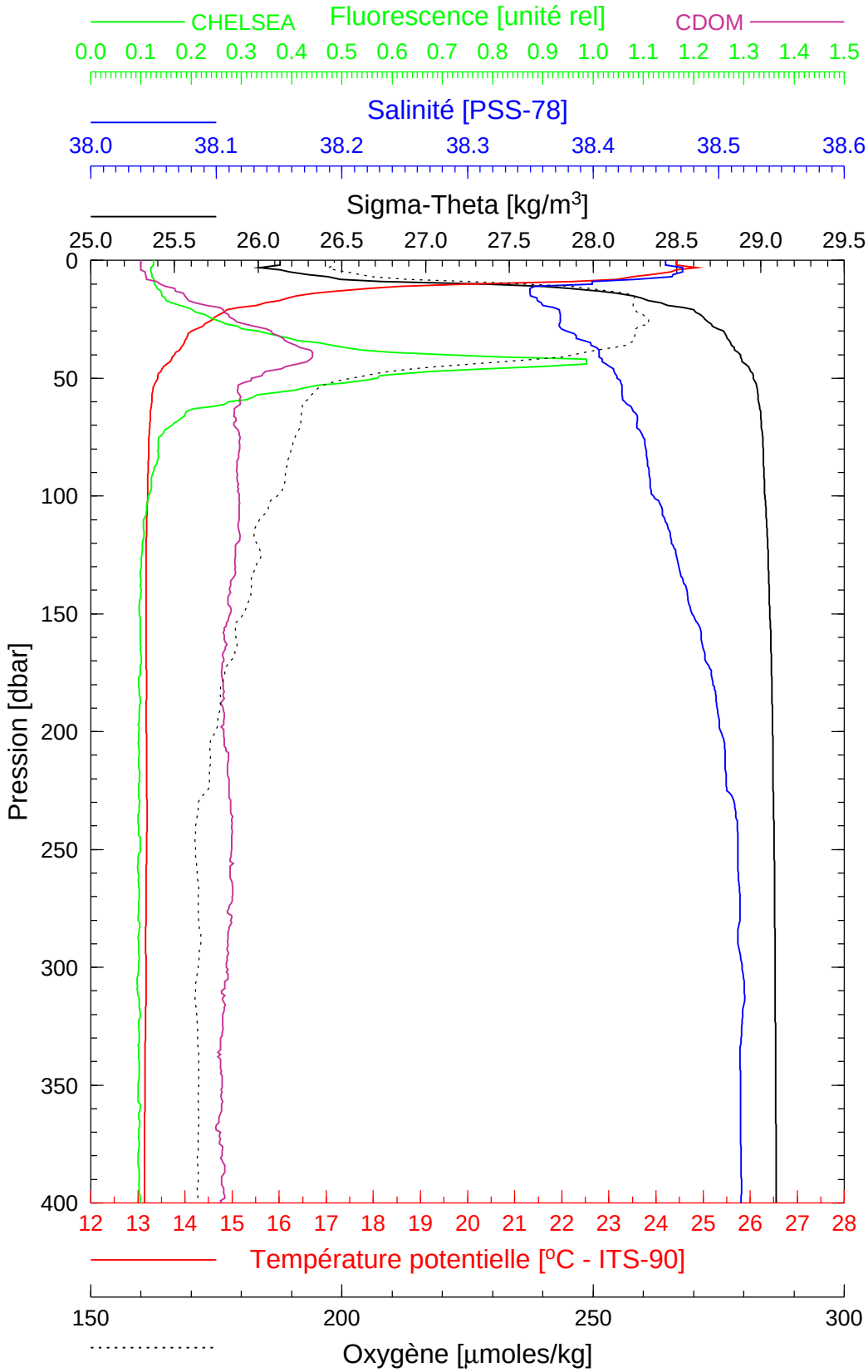
BOUS002



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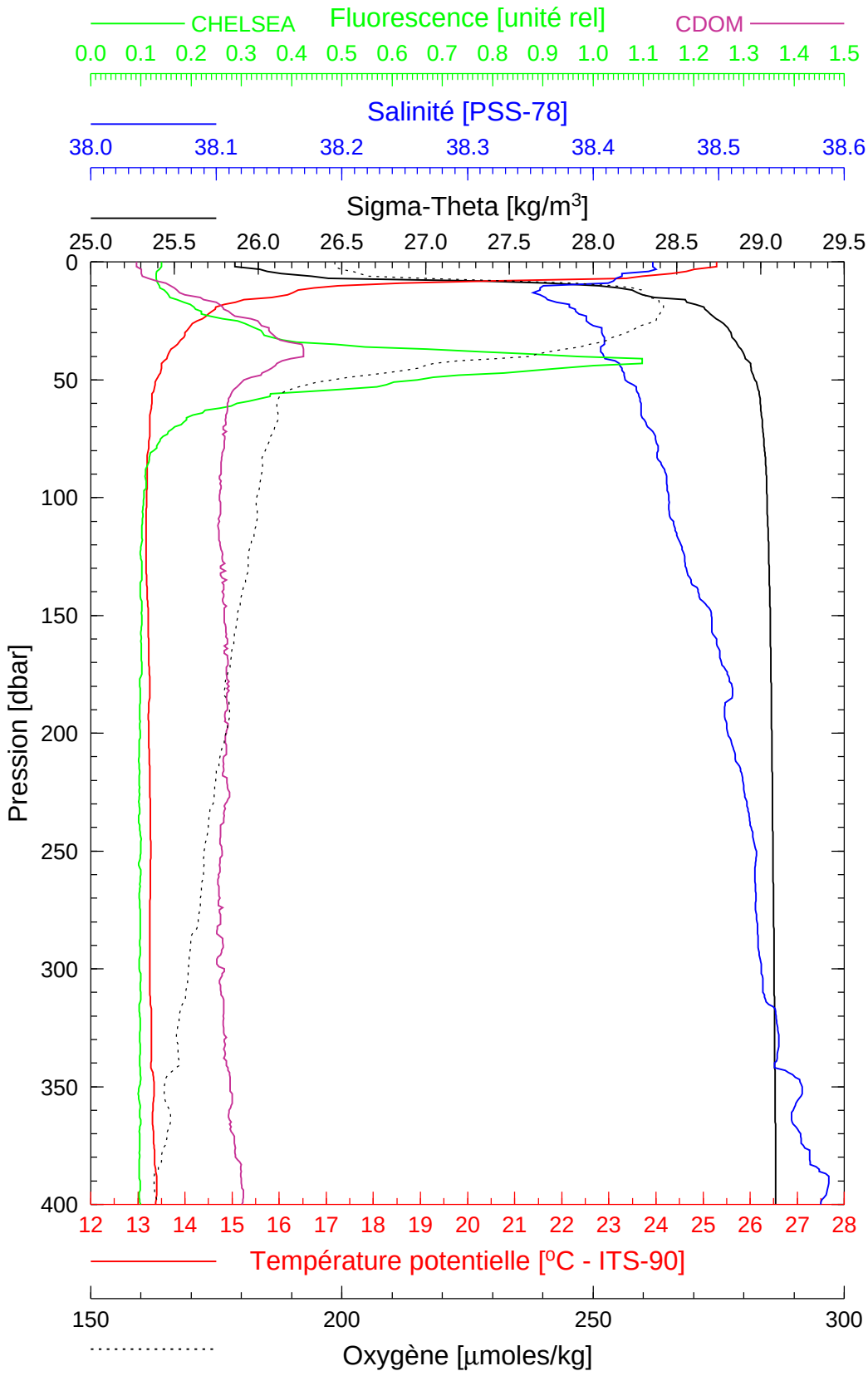
BOUS003



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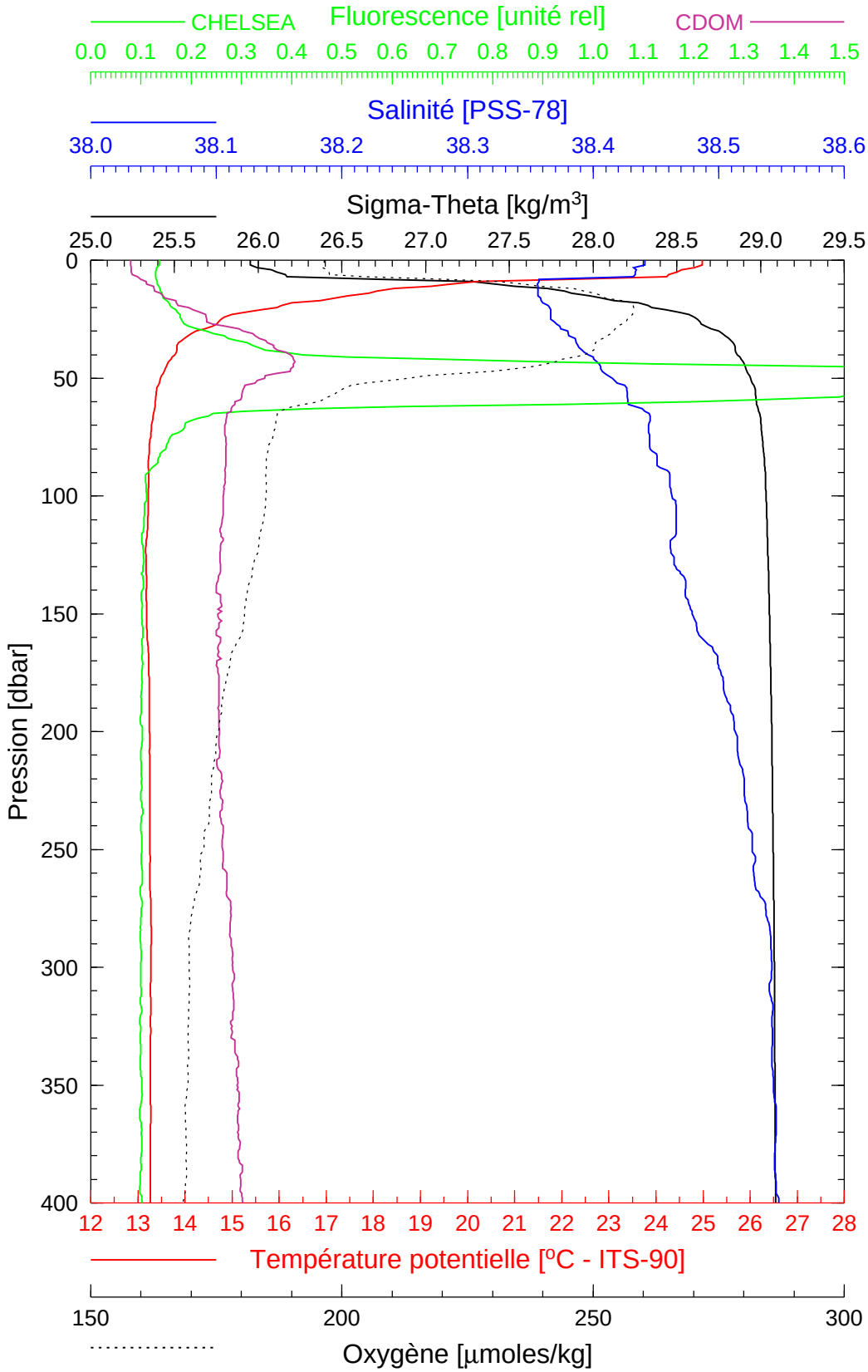
BOUS004



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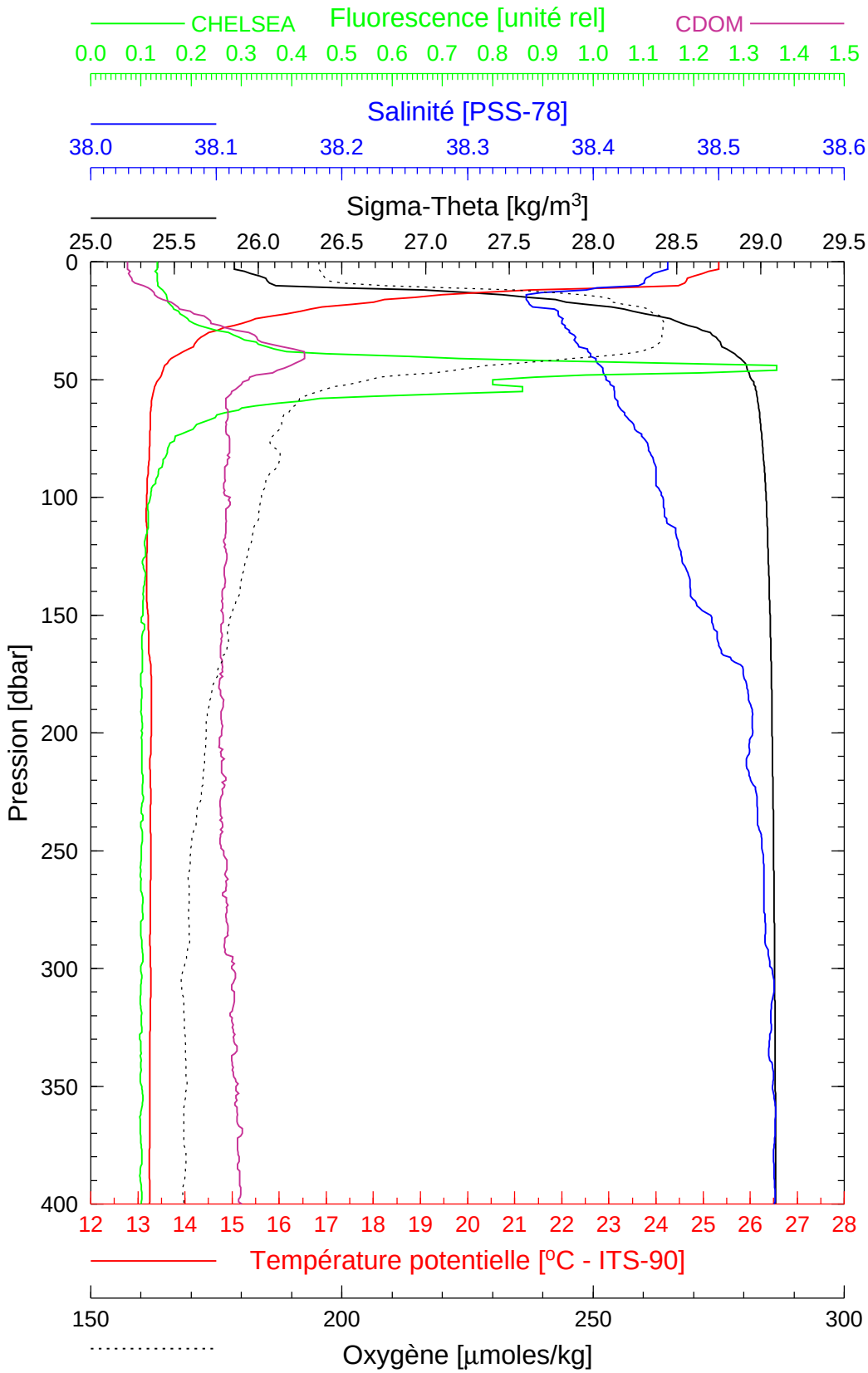
BOUS005



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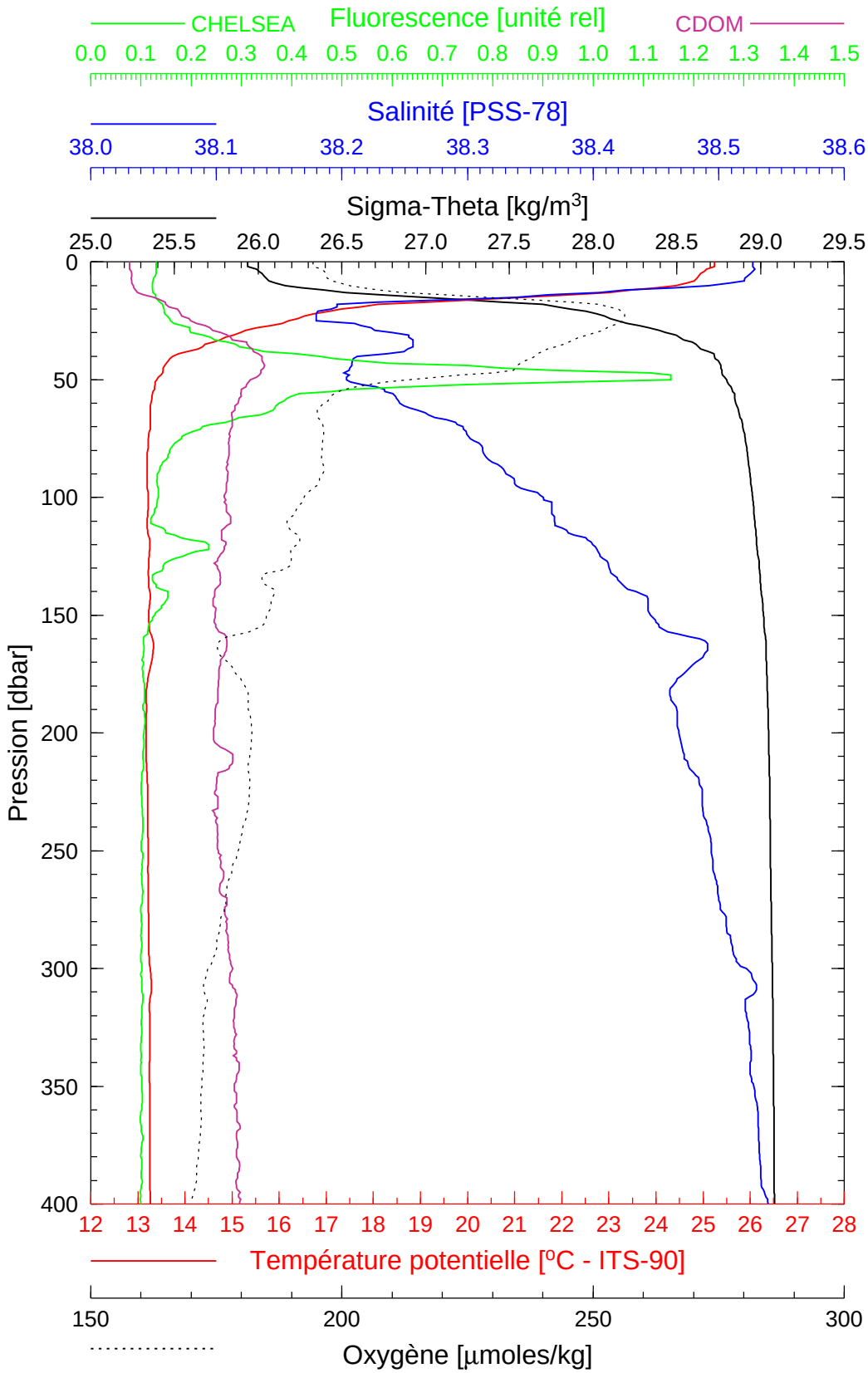

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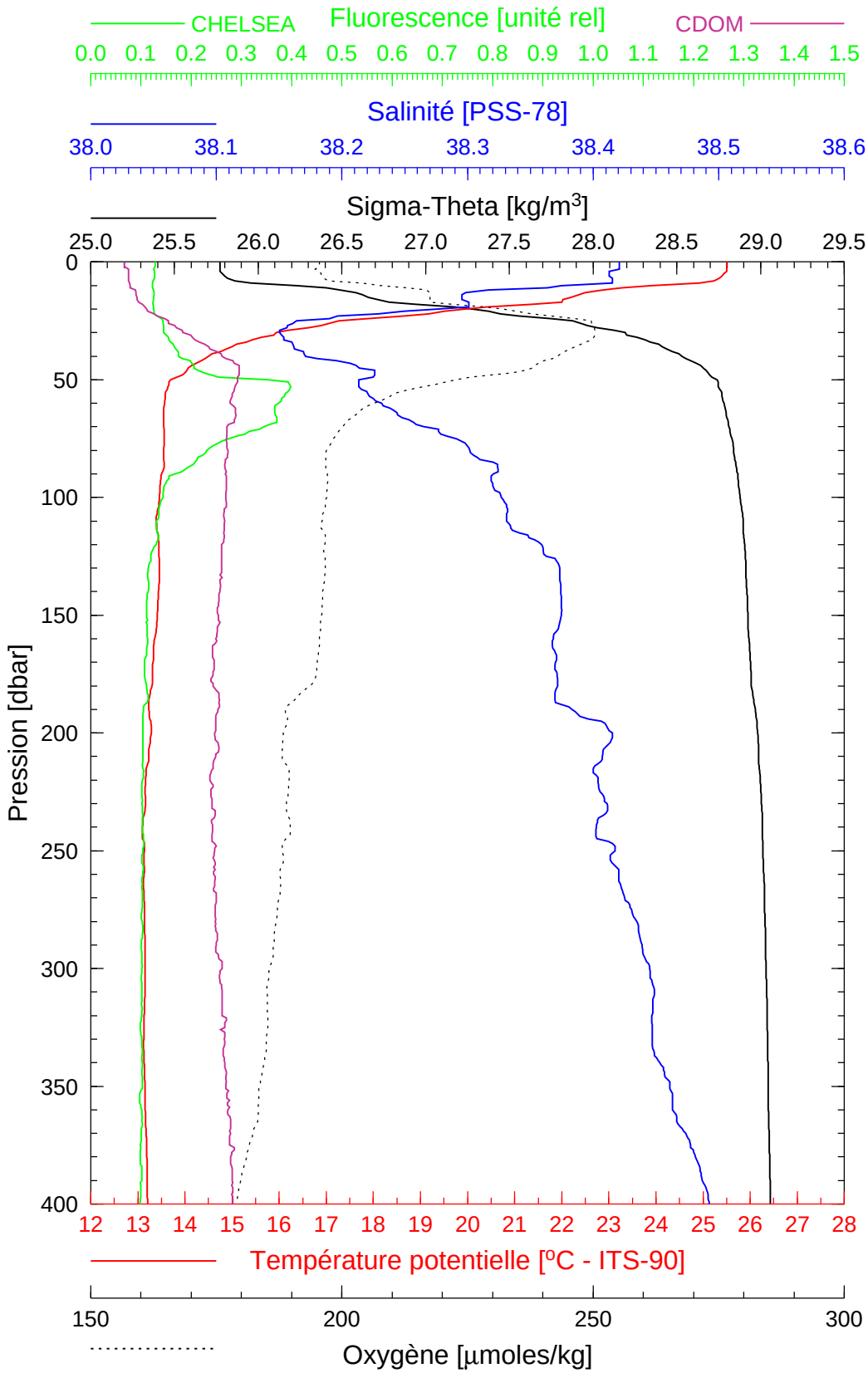

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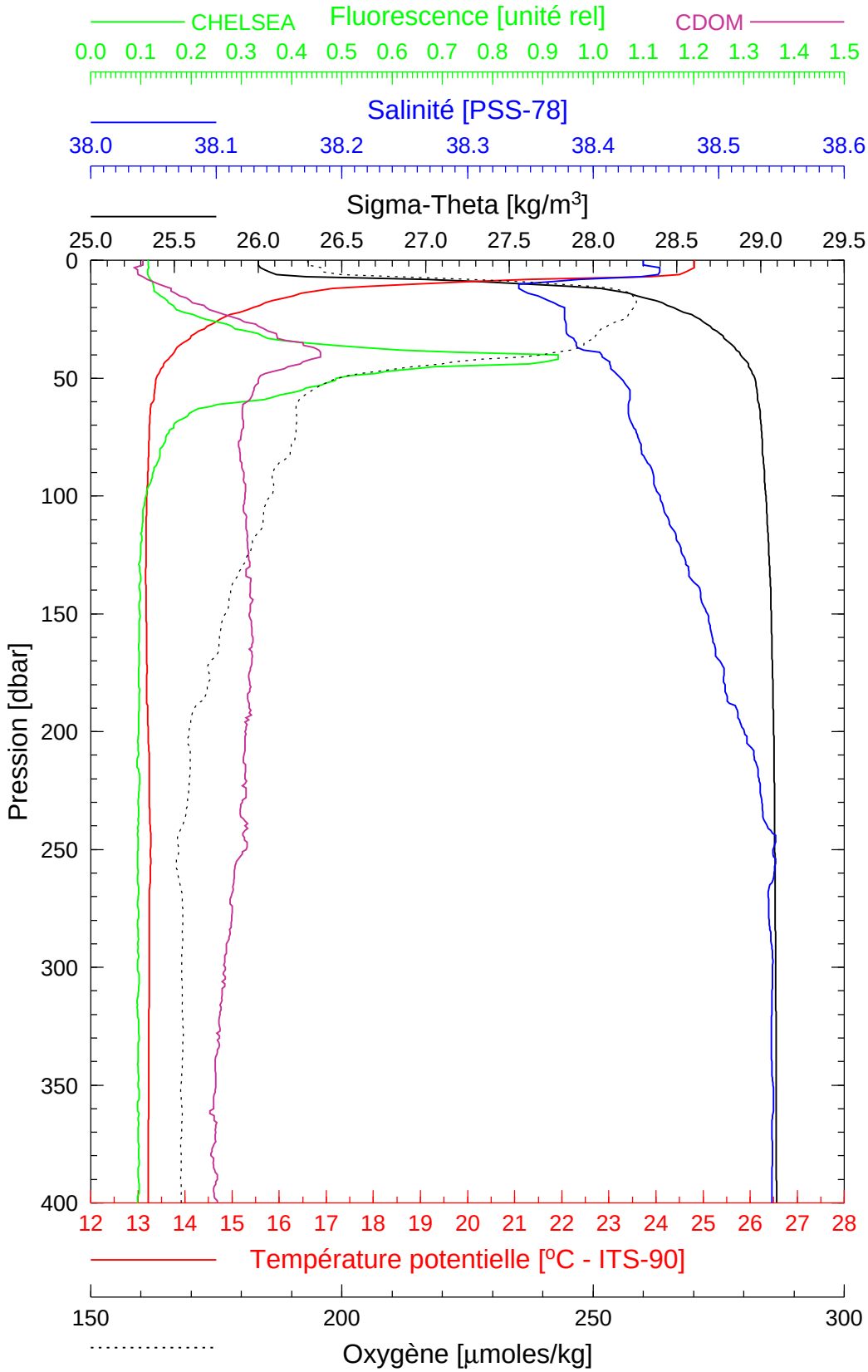

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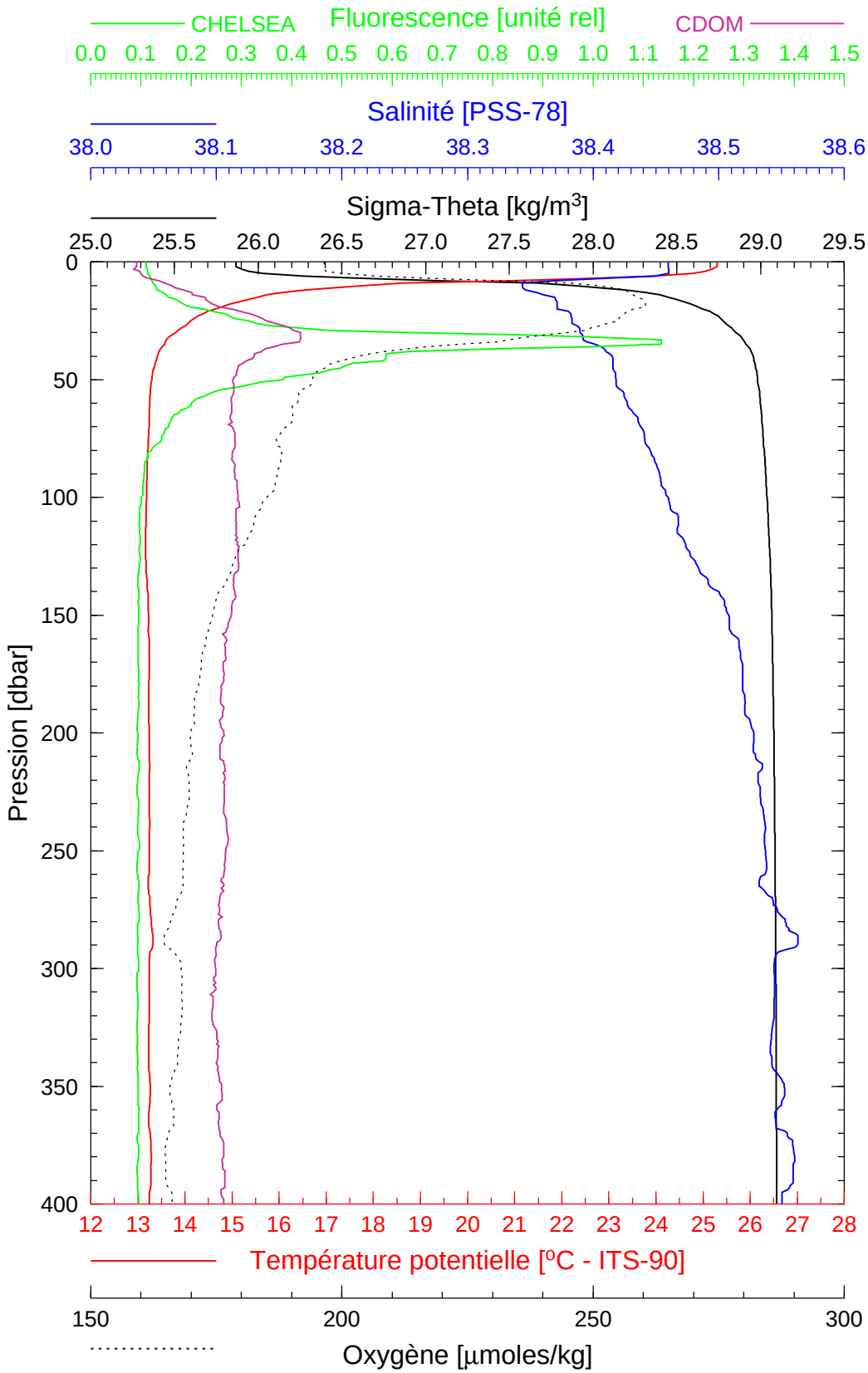

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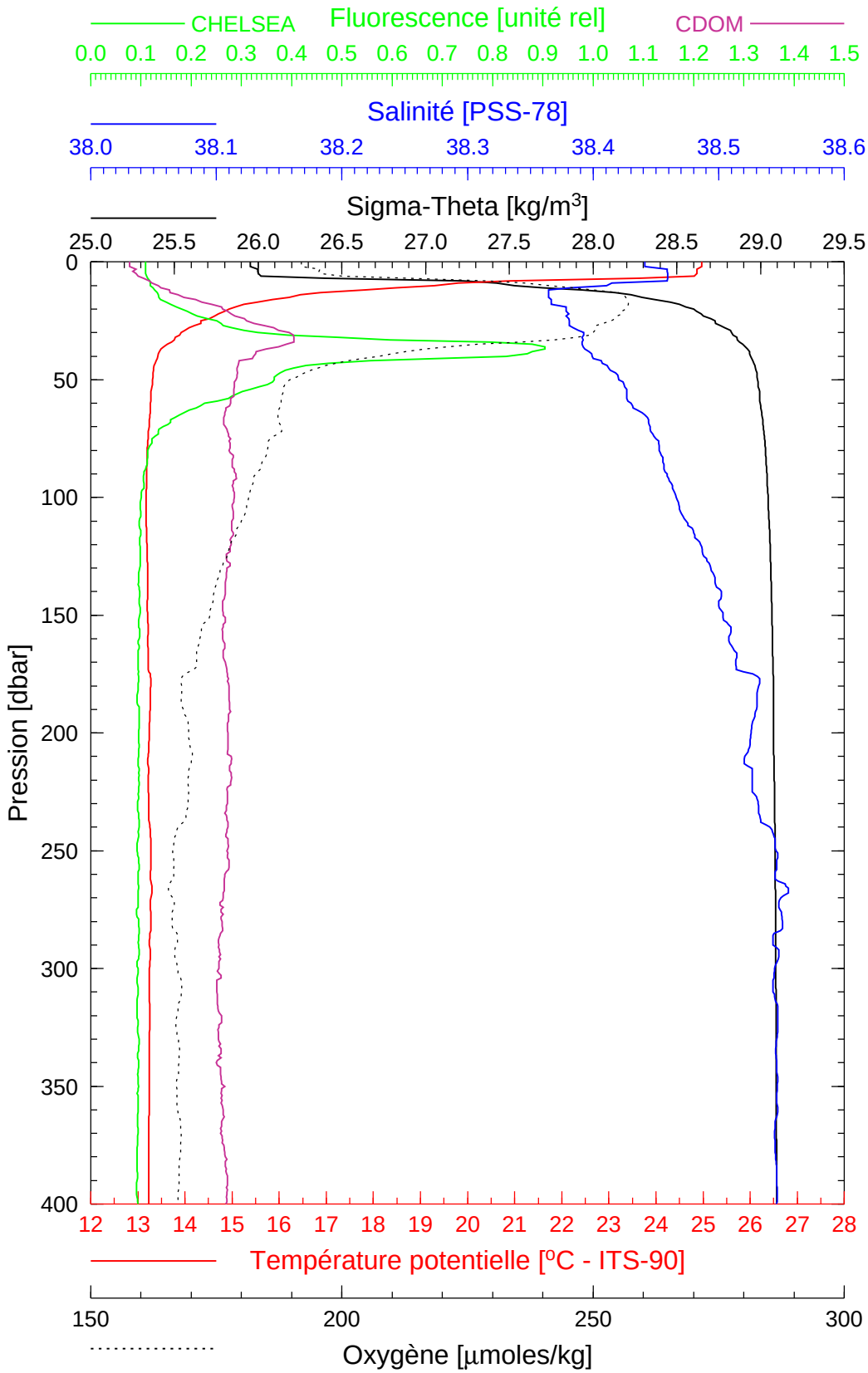
BOUS010



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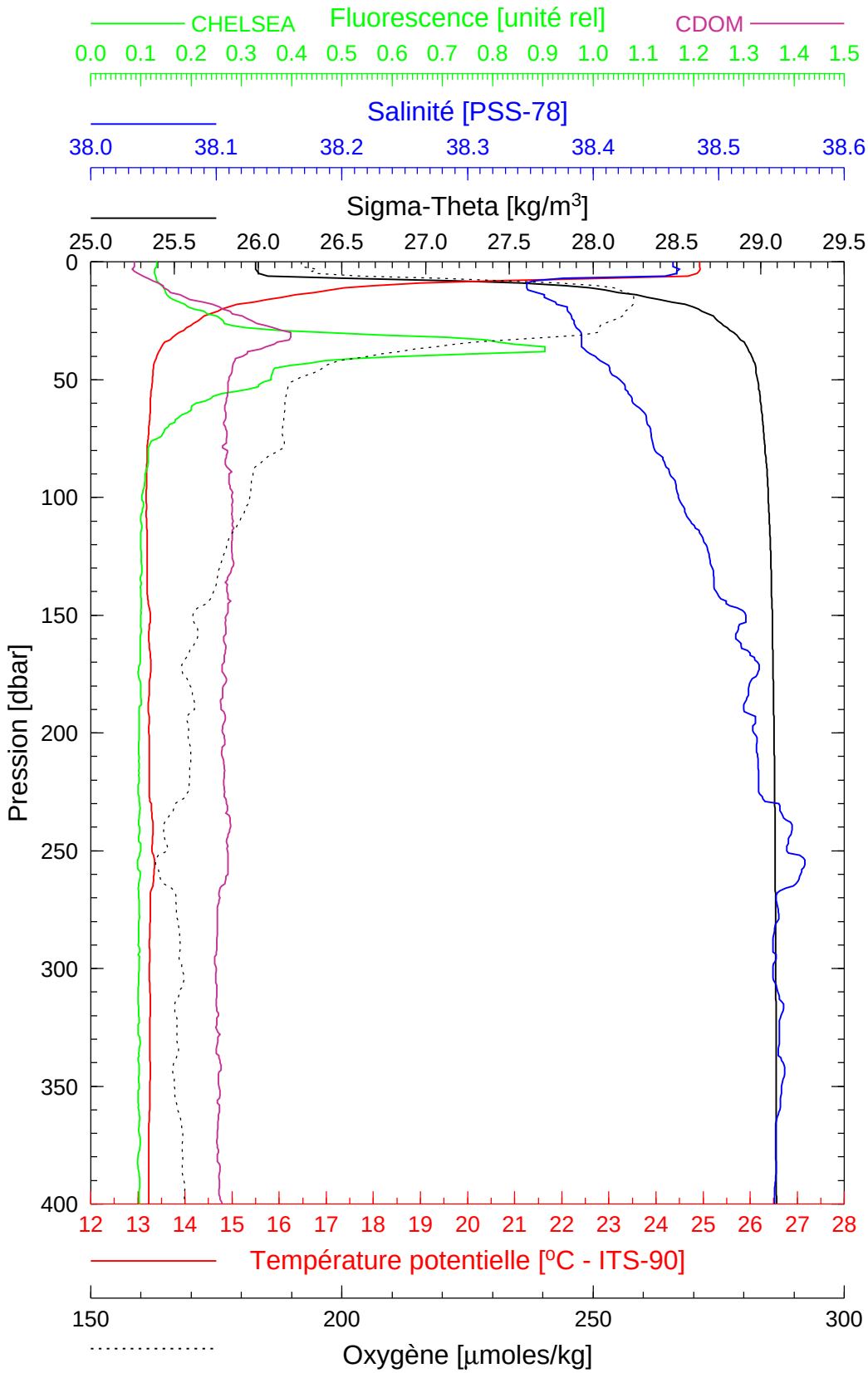

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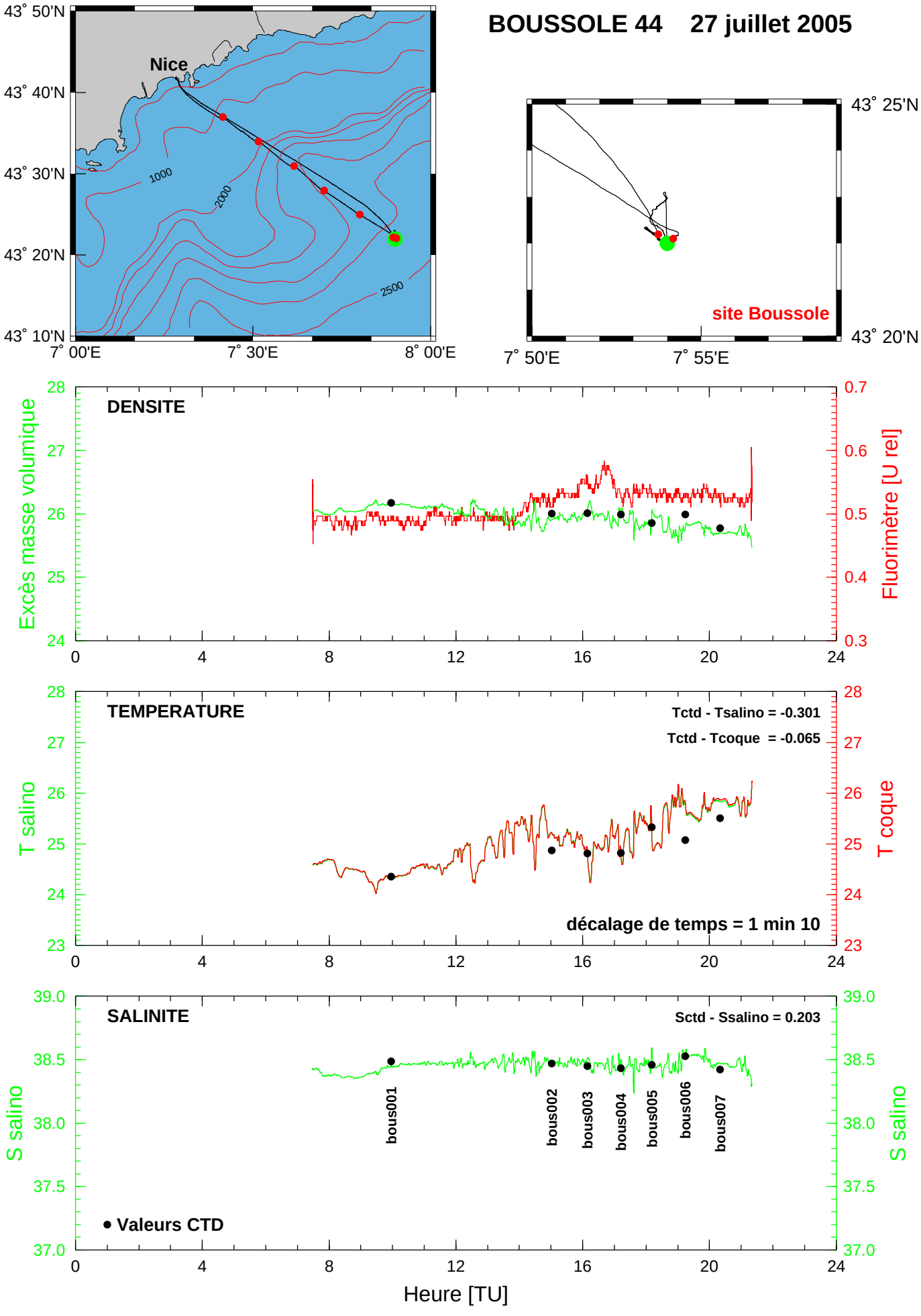
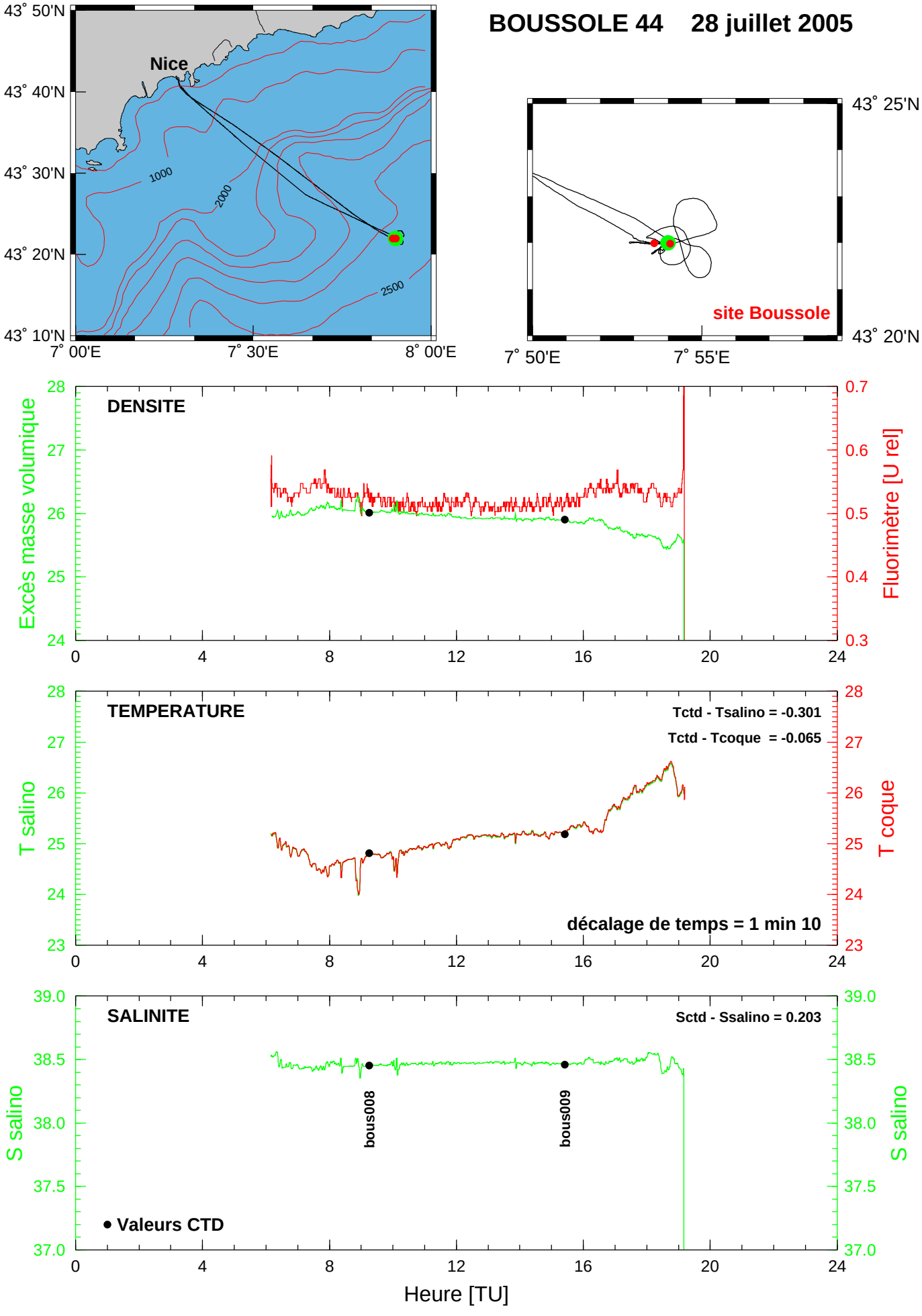

BOUSSOLE 44 27 juillet 2005
Nice
43° 50'N
43° 40'N
43° 30'N
43° 20'N
43° 10'N
7° 00'E
7° 30'E
8° 00'E
1000
2000
2500
43° 25'N
43° 20'N
7° 50'E
7° 55'E
site Boussole
DENSITE
Excès masse volumique
Fluorimètre [U rel]
TEMPERATURE
Tctd - Tsalino = -0.301
Tctd - Tcoque = -0.065
T salino
T coque
décalage de temps = 1 min 10
SALINITE
Sctd - Ssalino = 0.203
S salino
bous001
bous002
bous003
bous004
bous005
bous006
bous007
• Valeurs CTD
Heure [TU]


BOUSSOLE 44 28 juillet 2005
Nice
43° 50'N
43° 40'N
43° 30'N
43° 20'N
43° 10'N
7° 00'E
7° 30'E
8° 00'E
1000
2000
2500
43° 25'N
43° 20'N
7° 50'E
7° 55'E
site Boussole
DENSITE
Excès masse volumique
Fluorimètre [U rel]
TEMPERATURE
Tctd - Tsalino = -0.301
Tctd - Tcoque = -0.065
T salino
T coque
décalage de temps = 1 min 10
SALINITE
Sctd - Ssalino = 0.203
S salino
bous008
bous009
• Valeurs CTD
Heure [TU]

BOUSSOLE 44 29 juillet 2005