

BOUSSOLE Monthly Cruise Report

Cruise 108

March 03 - 06, 2011

Duty Chiefs: Emilie Diamond (diamond@obs-vlfr.fr)

Vessel: R/V Téthys II

(Captain: Renaud Lebourhis)

Science Personnel: Jean De Vaugelas, Emilie Diamond, Yves Lamblard, Vincent Taillandier, Vincenzo Vellucci and Pierre (diver).

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



Figure 1. Vincent Taillandier recovering the LOV glider named Tintin around the BOUSSOLE buoy.

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

March 14, 2011



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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 N₂ 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 gimbal 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

The diving day, the LISST-100X (a multi-parameter system for in-situ observations of particle size distribution), installed on the buoy, has been taken off. But because of a dysfunction on its programming, the LISST has not been put back on the buoy. One of the gliders of Hervé Claustre from the Laboratoire d'Océanographie de Villefranche (LOV) was recovered near the BOUSSOLE buoy the same day because of a dysfunction in a new sensor.

Cruise Summary

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

Thursday 03 March 2011

Bad weather prevented the departure from the Nice port.

Friday 04 March 2011

Bad weather prevented the departure from the Nice port.

Saturday 05 March 2011

The third day, the sea was slight with a light breeze, a blue sky and a good visibility. When on site, 3 SPMR profiles, 3 C-OPS profiles (after balance tests), 1 Secchi disk and 1 CTD cast with water sampling were performed. Then, the CTD transect was completed.

Sunday 06 March 2011

The last day, the sea was smooth with a gentle breeze, a blue sky and a good visibility. When arrived at the BOUSSOLE site, divers went at sea to take off the LISST-100X and to clean buoy instruments. They also put neoprene caps on the HS4 and on the transmissometers for acquiring three dark measurements. During the diving, 2 attempts of CISCO connection with the buoy failed. When on board, LISST data were retrieved but there was only 1 set of measurements done. We tried to reconfigure it but unsuccessfully. During this time, the LOV glider named Tintin was recovered around the BOUSSOLE buoy. After, ARGOS and CISCO connectors on the top of the buoy were cleaned and a direct connection with the buoy was established for data retrieval after 4 reboots of the system through the AK connector by divers. Then, 4 C-OPS profiles, 3 CIMEL measurements, 1 CTD cast with water sampling and 1 Secchi disk were performed before leaving.

Cruise Report

Thursday 03 March 2011

Bad weather prevented the departure from the Nice port.

Friday 04 March 2011

Bad weather prevented the departure from the Nice port.

Saturday 05 March 2011 (UTC)

People on board: Emilie Diamond and Vincent Taillandier.

0600 Departure from the Nice port.
0910 Arrival at the BOUSSOLE site.
0910 SPMR 01, 02, 03.
1005 C-OPS balance tests.
1040 C-OPS 01, 02, 03.
1130 Visual check solar panels of the buoy: ok.
1140 Secchi disk 01 (12 m).
1145 CTD 01, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 10 and 5 m for HPLC, Ap and TSM.
1235 Departure to the first transect station.
1310 CTD 02, 400 m, station 01 (43°25'N 07°48'E).
1410 CTD 03, 400 m, station 02 (43°28'N 07°42'E).
1510 CTD 04, 400 m, station 03 (43°31'N 07°37'E).
1610 CTD 05, 400 m, station 04 (43°34'N 07°31'E).
1705 CTD 06, 400 m, station 05 (43°37'N 07°25'E).
1750 CTD 07, 400 m, station 06 (43°39'N 07°21'E).
1815 Departure to the Nice port.
1845 Arrival at the Nice port.

Sunday 06 March 2011 (UTC)

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

0530 Departure from the Nice port.
0845 Arrival at the BOUSSOLE site.
0900 Diving on the buoy for taking off the LISST-100X and cleaning instruments. Dark HS4 and transmissometers measurements at 09:15, 09:30 and 09:45.
0915 CISCO connection with the buoy: unsuccessful (antenna not connected).
0930 LISST data retrieval: only 1 set of measurements.
1015 CISCO connection with the buoy: unsuccessful.
1030 Recovery of the glider.

1030 Attempt of LISST reconfiguration: unsuccessful.
 1110 Direct CISCO connection with buoy and partial data retrieval after a reboot of the system through the AK connector by divers. Instruments, CISCO and ARGOS connections cleaned on the top of the buoy.
 1200 C-OPS 04, 05, 06, 07.
 1310 CIMEL 01, 02, 03.
 1330 CTD 08, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, Ap, TSM and CDOM.
 1340 Secchi disk 01 (12 m).
 1410 Departure to the Nice port.
 1730 Arrival at the Nice port.

Problems identified during the cruise

- Bad weather prevented the departure from the Nice port for two days.
- When the LISST-100X data was retrieved, there was only 1 set of measurements in the file. We tried to reconfigure the instrument to have 1 minute of measurements each 15 minutes but unsuccessfully.
- The buoy data retrieval was not complete because of an interruption of direct CISCO connection.
- There were no weather data on board during this cruise (except with a hygrometer and a barometer) and the last day the thermosalinometer and the ADCP (Acoustic Doppler Current Profiler) did not work.

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

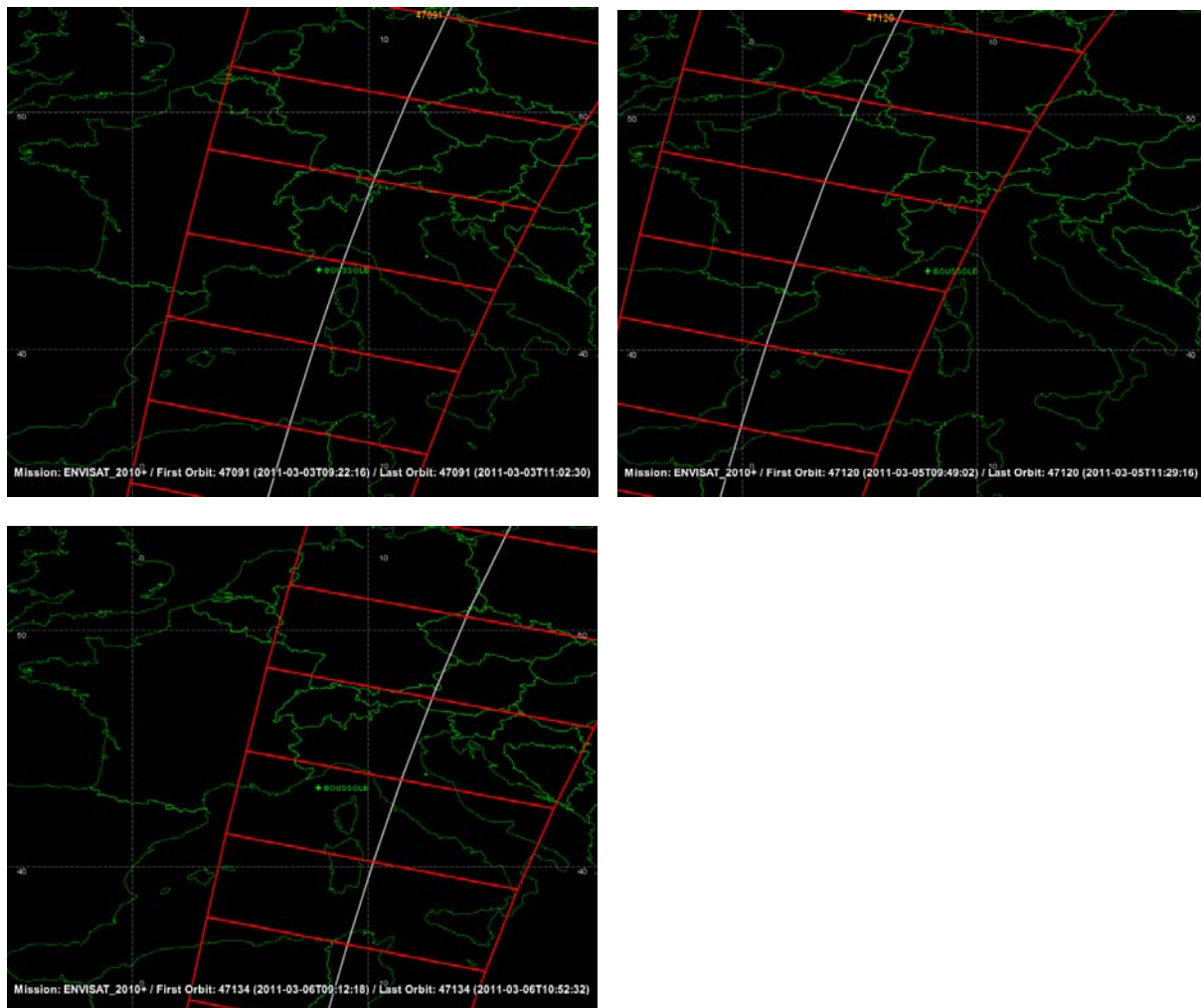


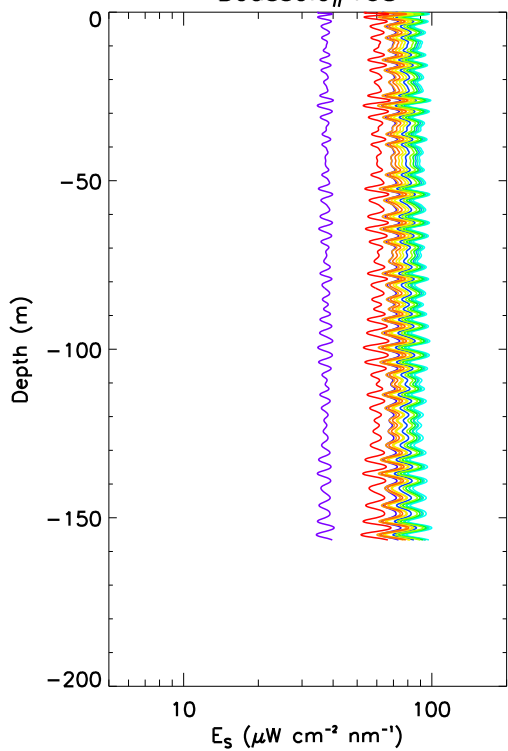
Figure 2. Calculated swath paths for MERIS (Esov NG software) above BOUSSOLE site for 3rd, 5th and 6th of March 2011.

Appendix

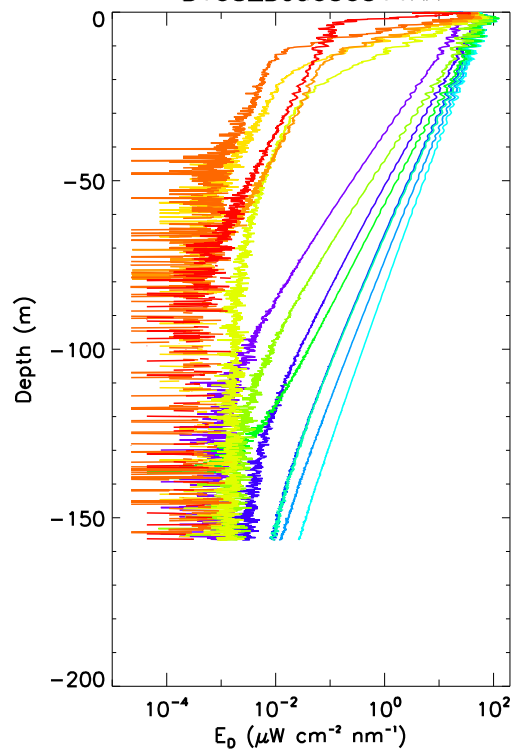
Cruise Summary Table for Boussole 108

Date	Black names (file ext: ".raw")	Profile names (file extension: ".raw")	CTD notées / satellite overpass	Other sensors	Start Time GMT (hour.min)	Duration (min.sec)	Depth max (meter)	Latitude (N)		longitude		Sky	Clouds	Quantity (#/8)	Weather		Atm. Pressure (hPa)	Humidity (%)	Visibility	T air	T water	Sea	Swell H (m)	Swell dir.	Whitecaps
								(Degree)	(Minute)	(Degree)	(Minute)				Wind sp. (kn)	Wind dir.									
03/03/11																									
04/03/11																									
	Bou050311black1				09:10	3:00																			
		Bou050311AA			09:25	3:48	156.6	43	22.665	7	53.501	blue	Cl&Cu	2	5	325	1017.0	68	good	11.2		moved	1.1		no
		Bou050311AB			09:44	3:03	104.6	43	22.386	7	53.126	blue	Cl&Cu	2	5	325	1017.0	68	good	11.2		moved	1.1		no
		Bou050311AD			09:54	3:41	111	43	22.311	7	53.840	blue	Cl&Cu	2	5	325	1017.0	68	good	11.2		moved	1.1		no
	Bou050311black2				10:07	3:00																			
	bou c-ops 110305	1008 001 data			10:09	1:19																			
		bou c-ops 110305 1008 002 data			10:45	4:32	83.5	43	22.211	7	53.359	overcast	As&Cu	6	6	307	1017.0	66	good	11.3		calm	0.8		no
		bou c-ops 110305 1008 004 data			11:00	5:39	108.1	43	22.017	7	53.080	overcast	As&Cu	6	6	307	1017.0	66	good	11.3		calm	0.8		no
		bou c-ops 110305 1008 005 data			11:15	4:14	75.1	43	21.965	7	52.694	overcast	As&Cu	6	6	307	1017.0	66	good	11.3		calm	0.8		no
	bou c-ops 110305 1008 006 data				11:30	1:19																			
					11:45	3:00	18	43	22	7	54	blue		3					good			calm			no
		CTDBOUS001		Secchi01	11:55	38:00	400	43	22.089	7	53.789	blue		4	7	277	1017.0	68		11.6	12.9	calm			no
		CTDBOUS002		HPLC, Ap & TSM	13:13	23:00	400	43	24.964	7	47.929	blue		4	9	248	1017.0	68		11.7	13.2	calm			no
		CTDBOUS003			14:15	23:00	400	43	28.040	7	41.854	overcast		5	NA	NA	1017.0	68		NA	13.2	calm			yes
		CTDBOUS004			15:16	21:00	400	43	31.014	7	36.955	overcast		5	NA	NA	1017.0	68		NA	13.2	calm			yes
		CTDBOUS005			16:13	23:00	400	43	34.150	7	30.810	overcast		5	NA	NA	1017.0	68		NA	13.2	calm			yes
		CTDBOUS006			17:08	22:00	400	43	37.068	7	24.900	overcast		5	NA	NA	1017.0	68		NA	13.2	calm			no
		CTDBOUS007			17:55	22:00	400	43	39.104	7	20.954	overcast		4	NA	NA	1017.0	68		NA	13.2	calm			no
	bou c-ops 110306 1200 001 data				12:04	1:45																			
		bou c-ops 110306 1200 002 data			12:26	5:04	93.6	43	22.396	7	54.008	blue	Ac&Cl	1	8	245	1015.0	75	good	12.3		calm	0.5		no or few
		bou c-ops 110306 1200 005 data			12:52	3:59	64.3	43	22.937	7	53.964	blue	Ac&Cl	1	8	245	1015.0	75	good	12.3		calm	0.5		no or few
		bou c-ops 110306 1200 007 data			13:06	3:18	50.3	43	23.095	7	54.137	blue	Ac&Cl	1	8	245	1015.0	75	good	12.3		calm	0.5		no or few
		bou c-ops 110306 1200 008 data			13:05	3:41	63.8	43	23.172	7	54.168	blue	Ac&Cl	1	8	245	1015.0	75	good	12.3		calm	0.5		no or few
	bou c-ops 110306 1200 009 data				13:39	1:18																			
					13:14	6:00		43	23.172	7	54.168	blue		1			1015.0		good						
					13:21	5:00		43	23.172	7	54.168	blue		1			1015.0		good						
					13:26	5:00		43	23.172	7	54.168	blue		1			1015.0		good						
		CTDBOUS008		HPLC, Ap, TSM & CDOM	13:39	36:00	400	43	22.157	7	53.980	blue		2	8	250	1015.0	72		12.5	13.0	calm			no
				Secchi02	13:40	3:00	19	43	22	7	54	blue		2					good			calm			no

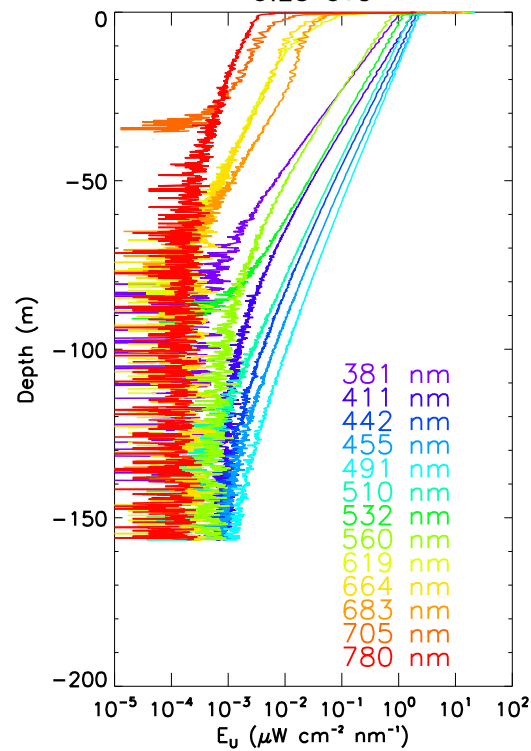
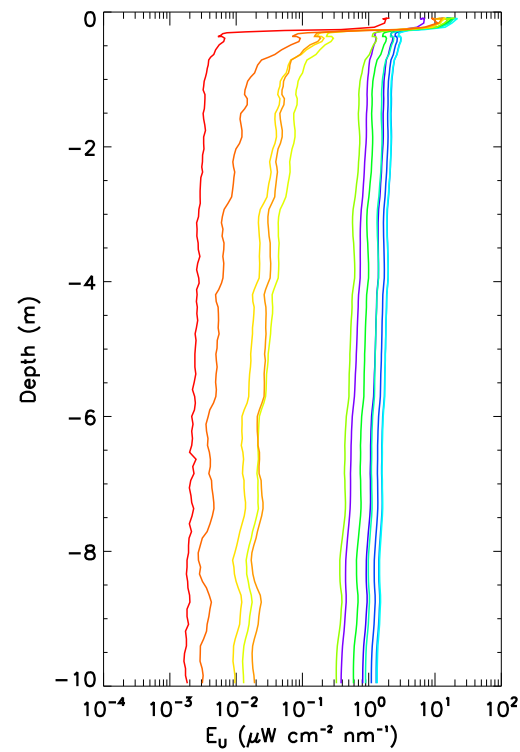
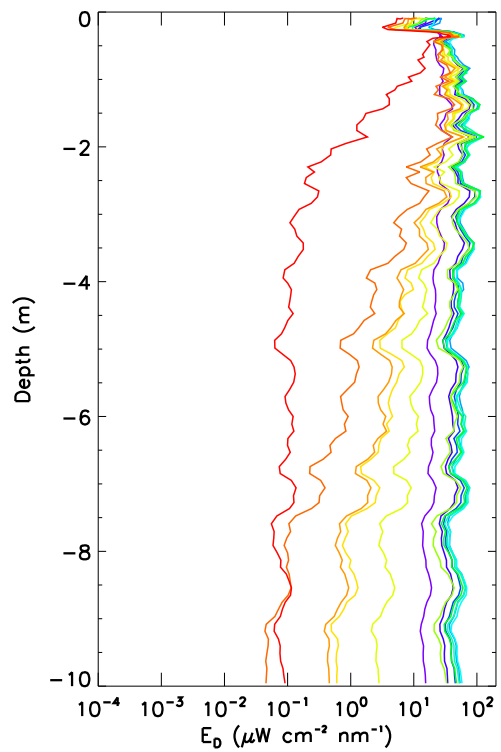
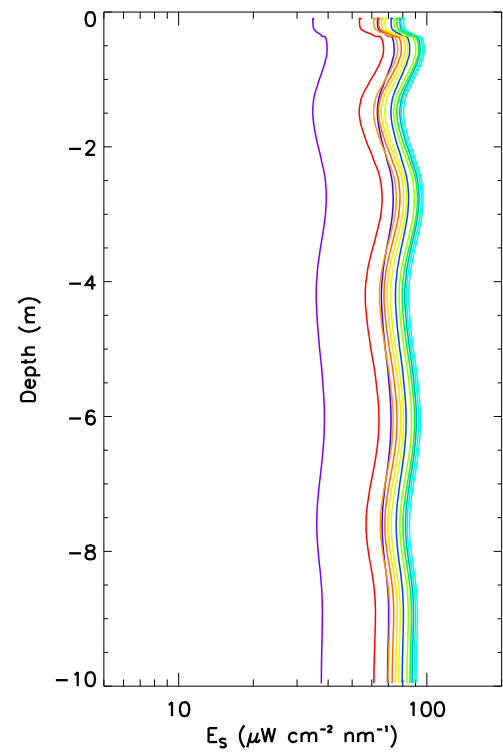
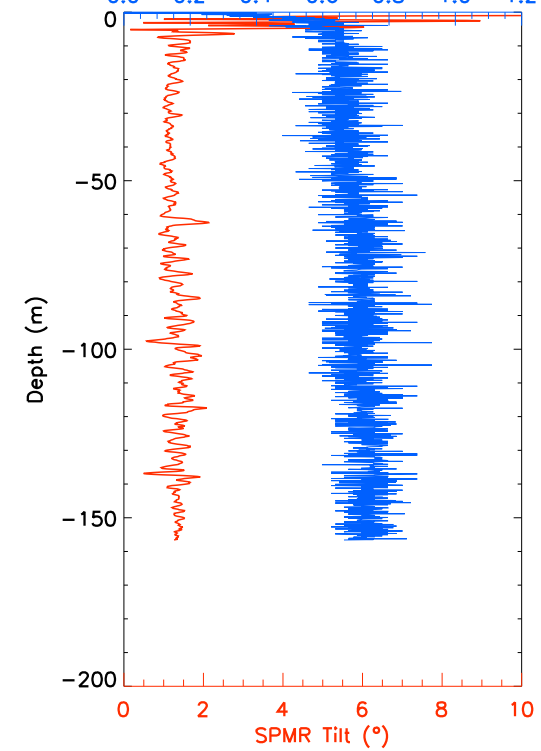
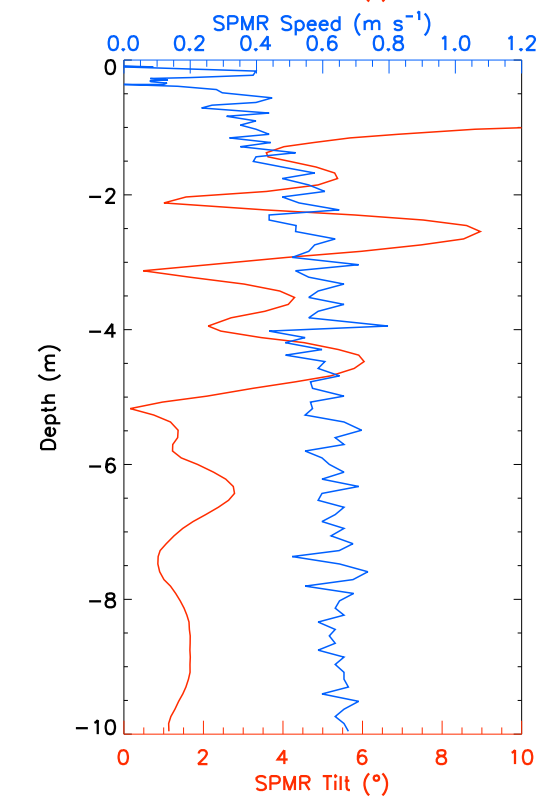
Boussole#108



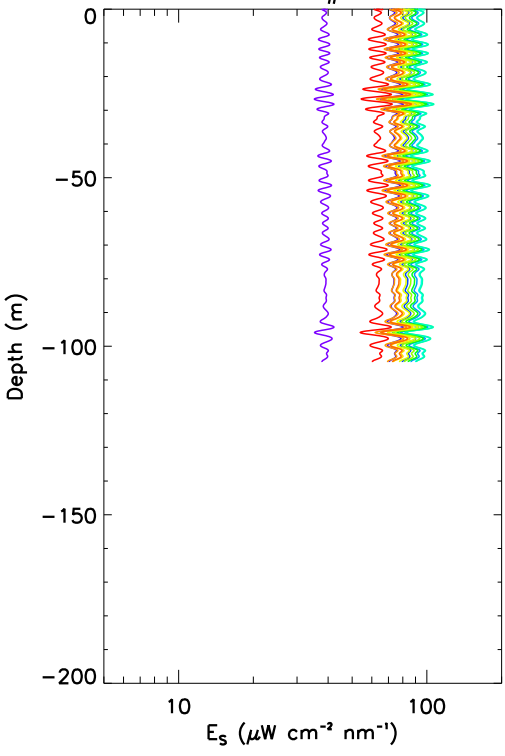
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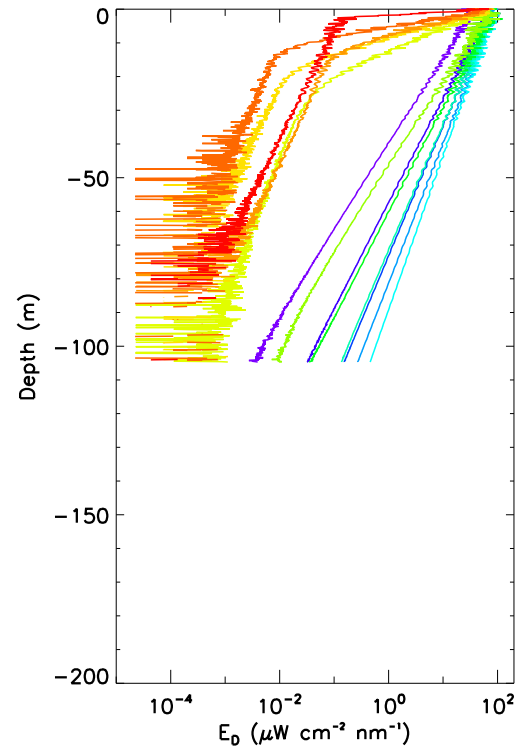
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SPMR Speed (m s^{-1})SPMR Speed (m s^{-1})

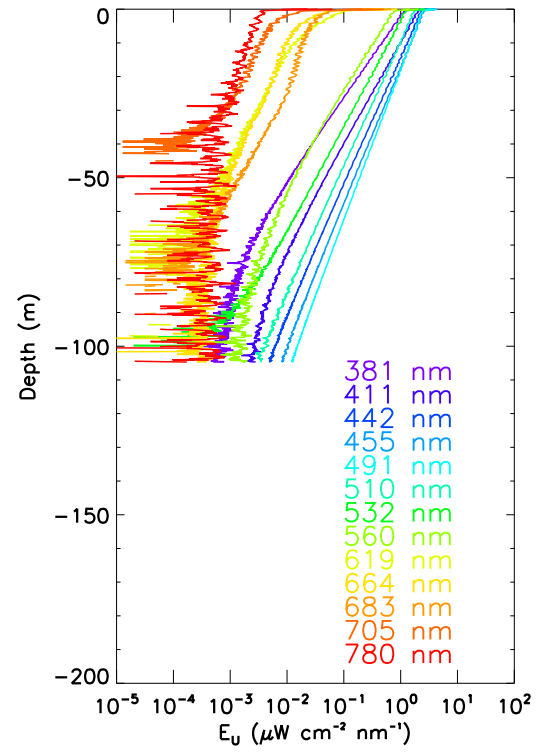
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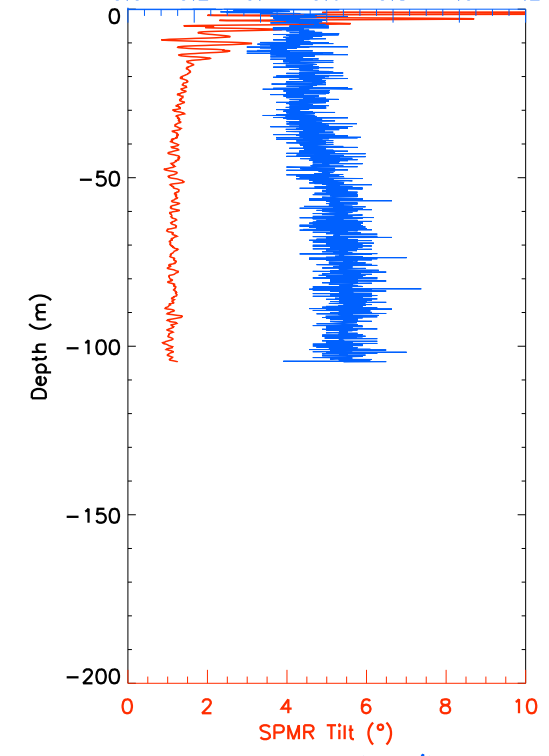
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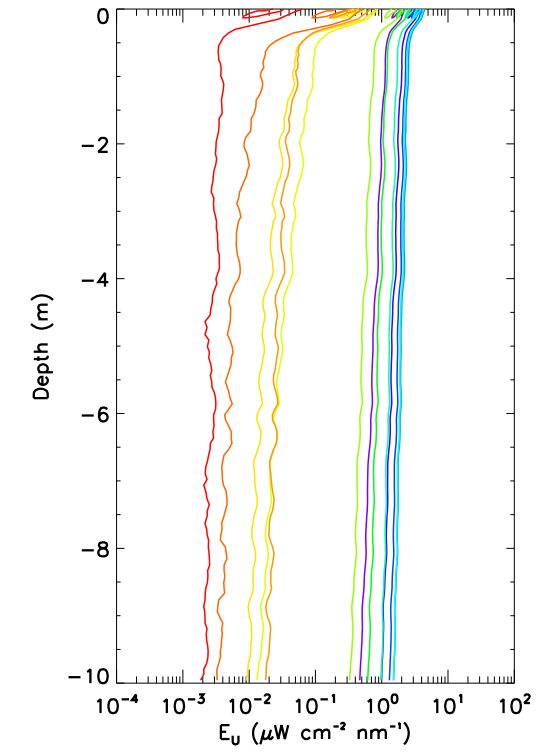
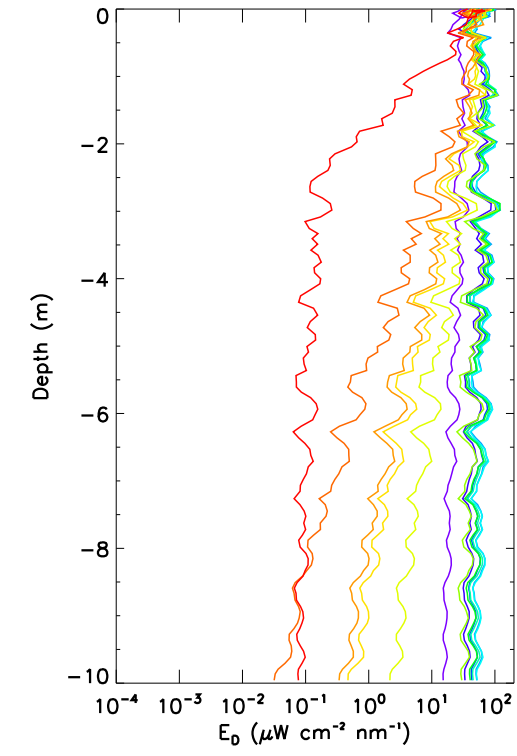
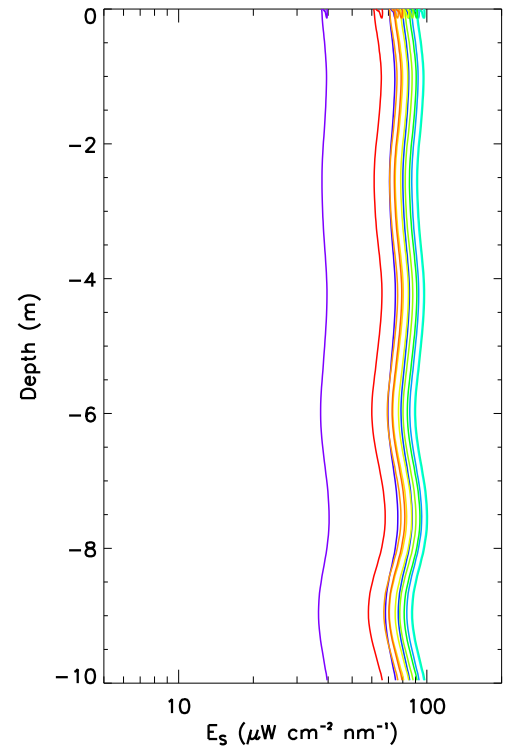
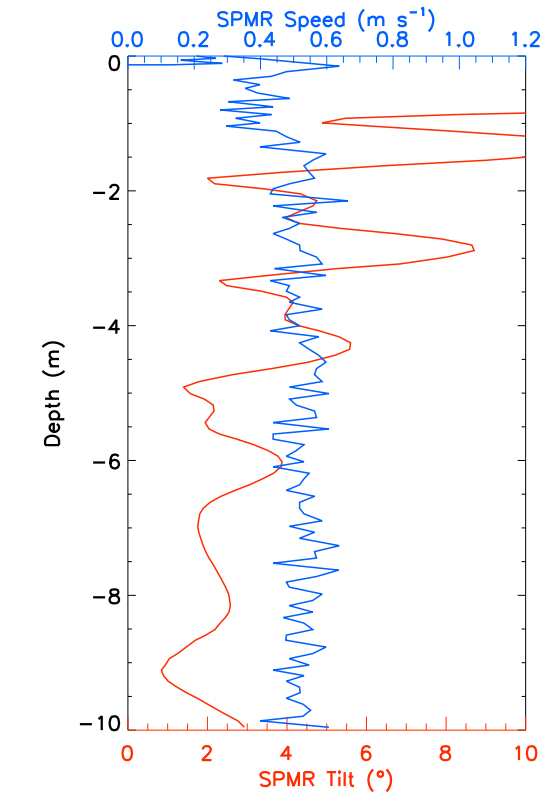
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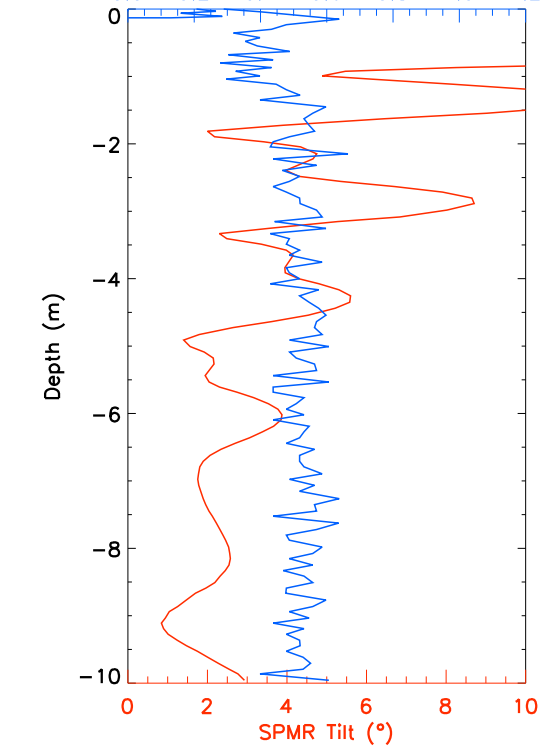
SPMR Speed (m s^{-1})



SPMR Tilt ($^\circ$)

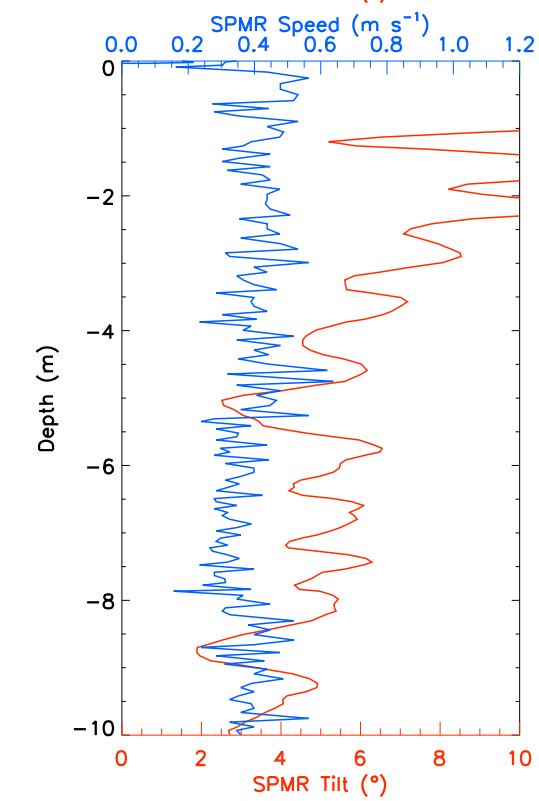
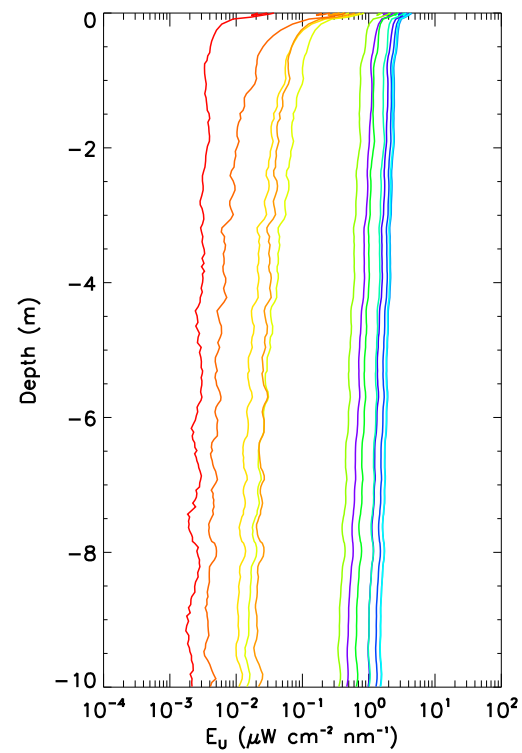
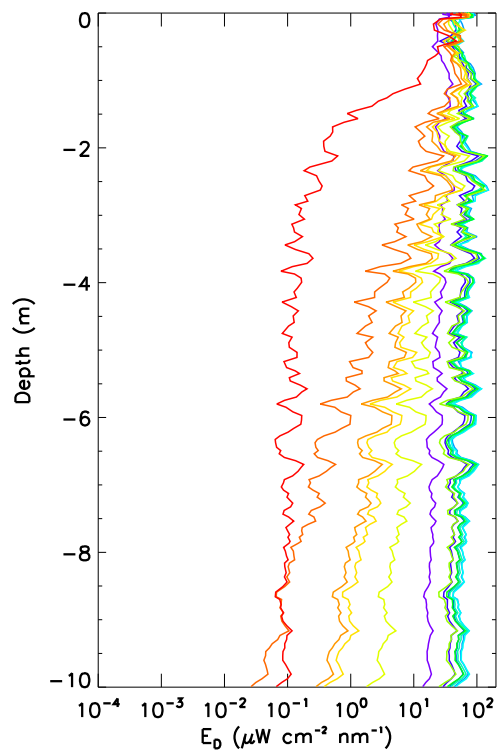
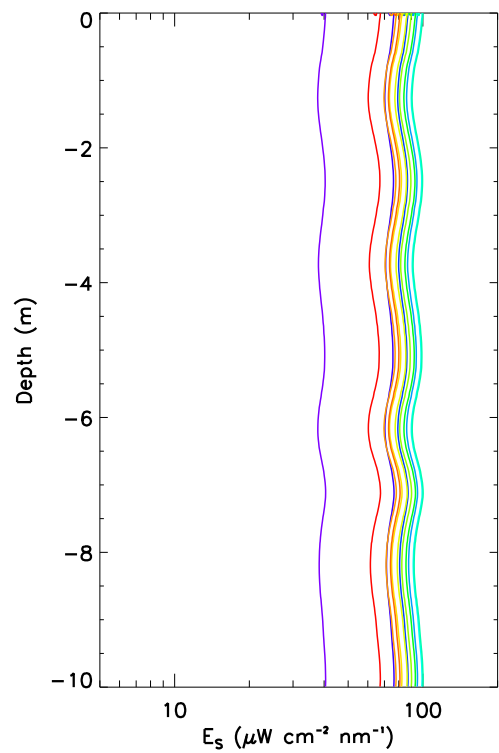
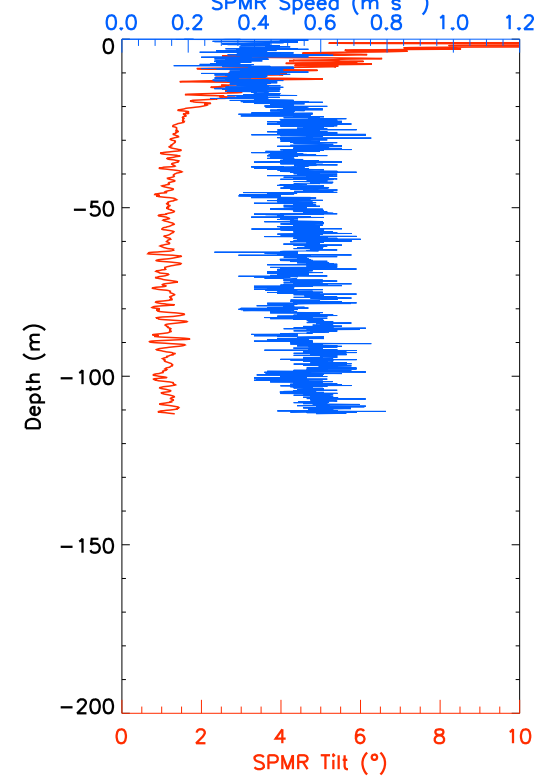
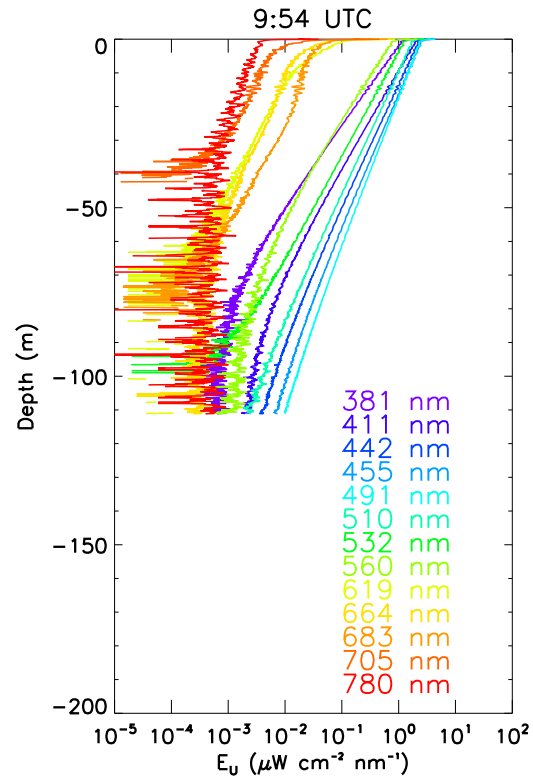
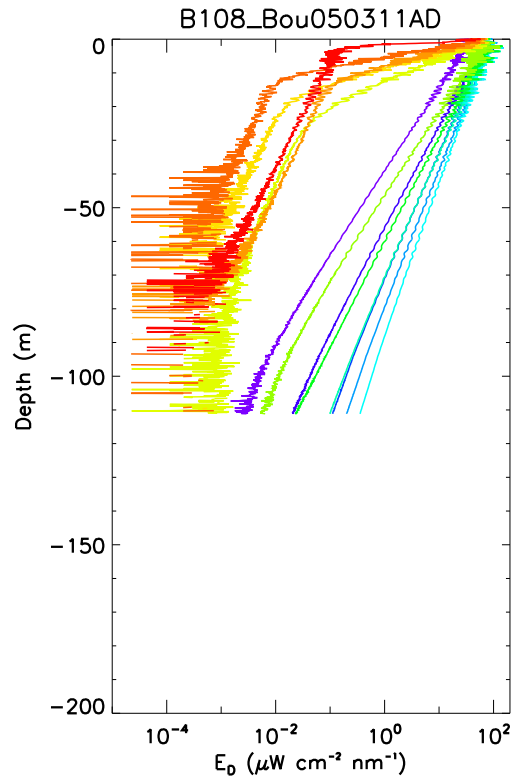
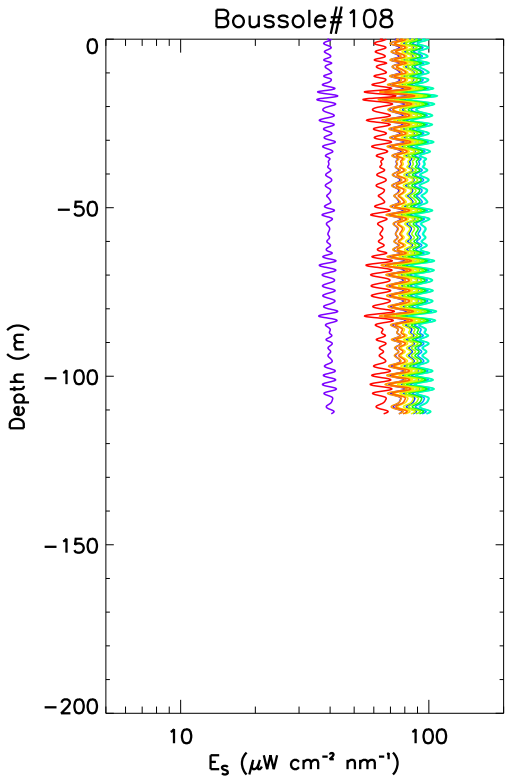


SPMR Speed (m s^{-1})



SPMR Tilt ($^\circ$)



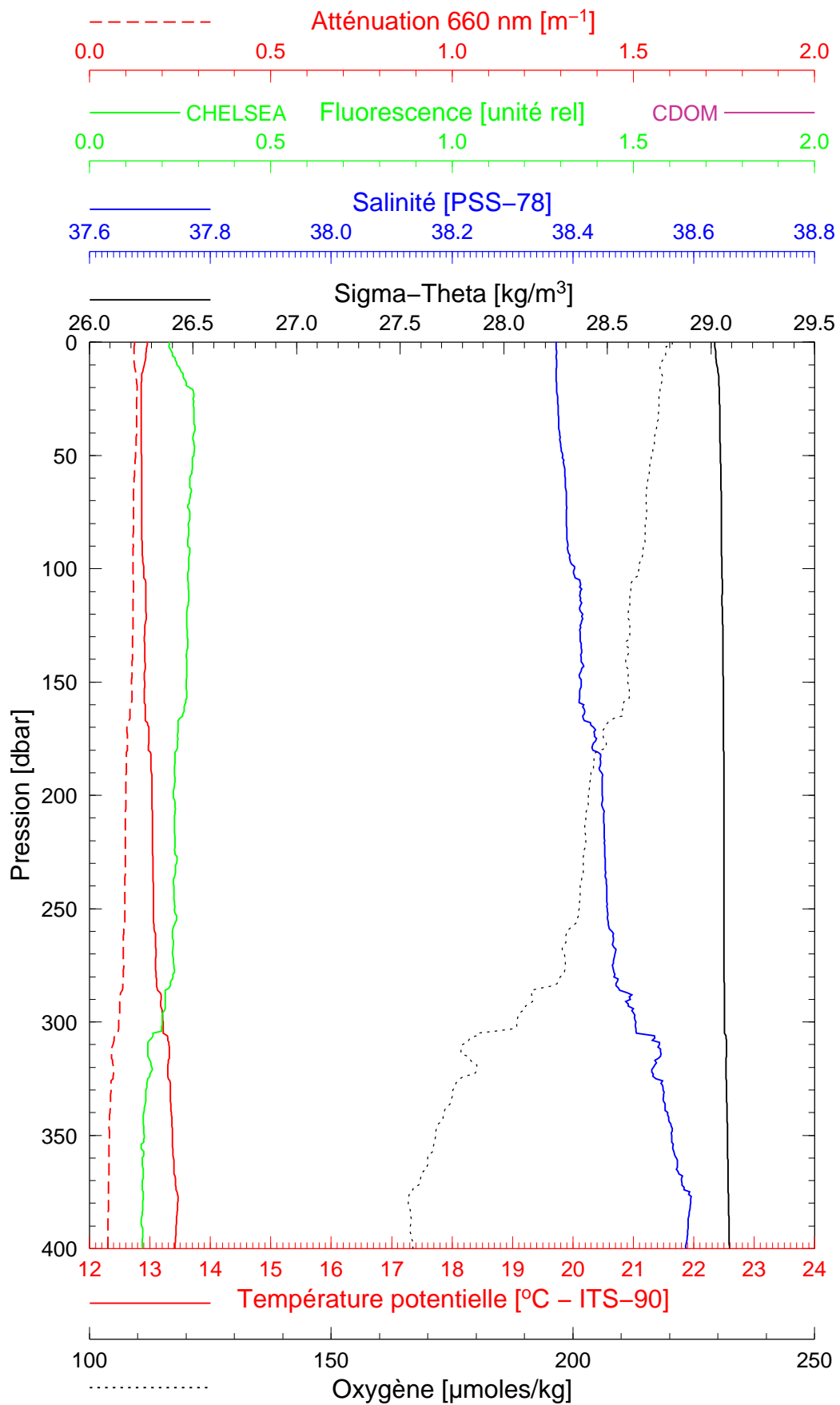


BOUSSOLE 108

05/03/2011

BOUS110305_01

BOUS001



Date 05/03/2011
Heure déb 11h 55min [TU]

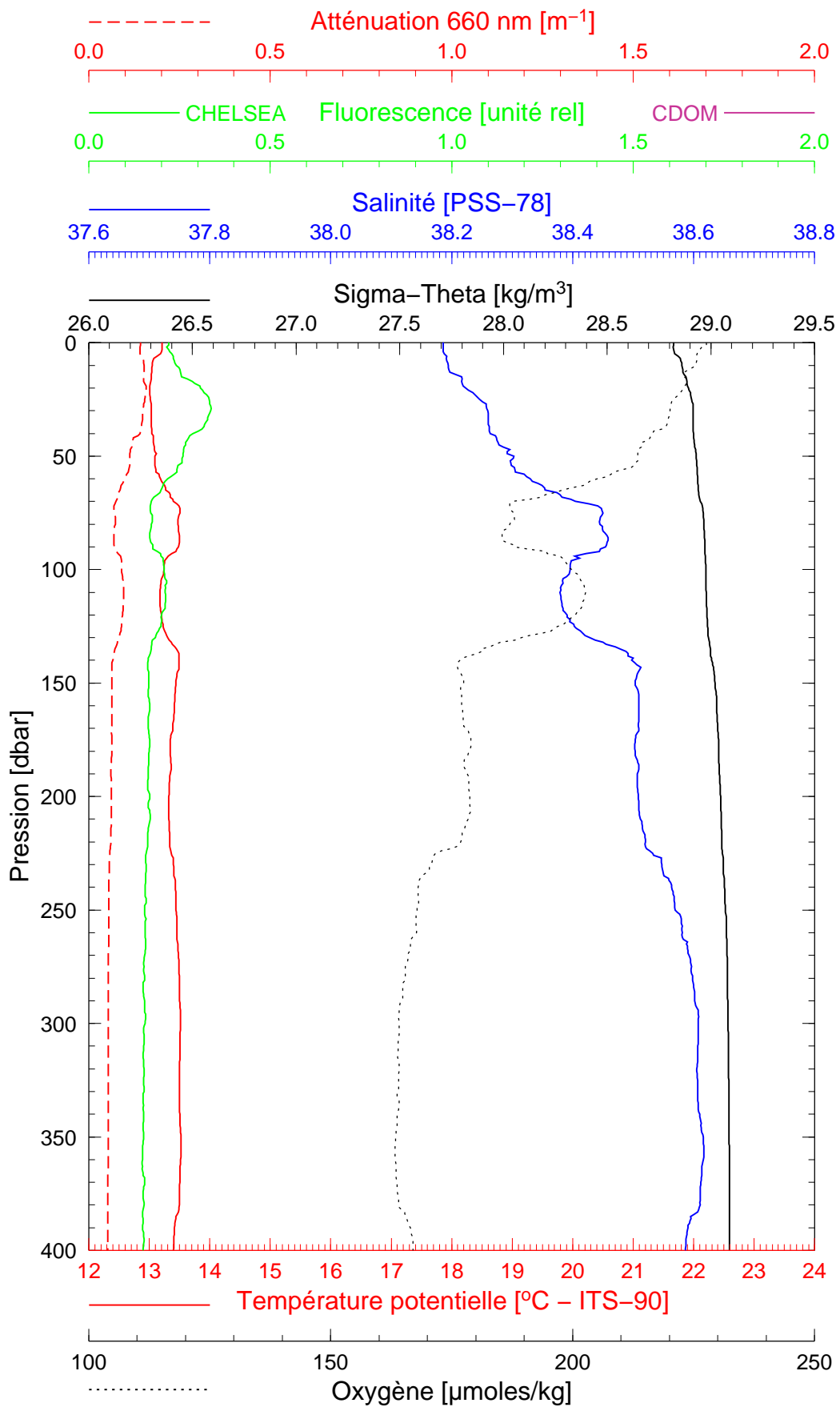
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BOUSSOLE 108

05/03/2011

BOUS110305_02

BOUS002



Date 05/03/2011
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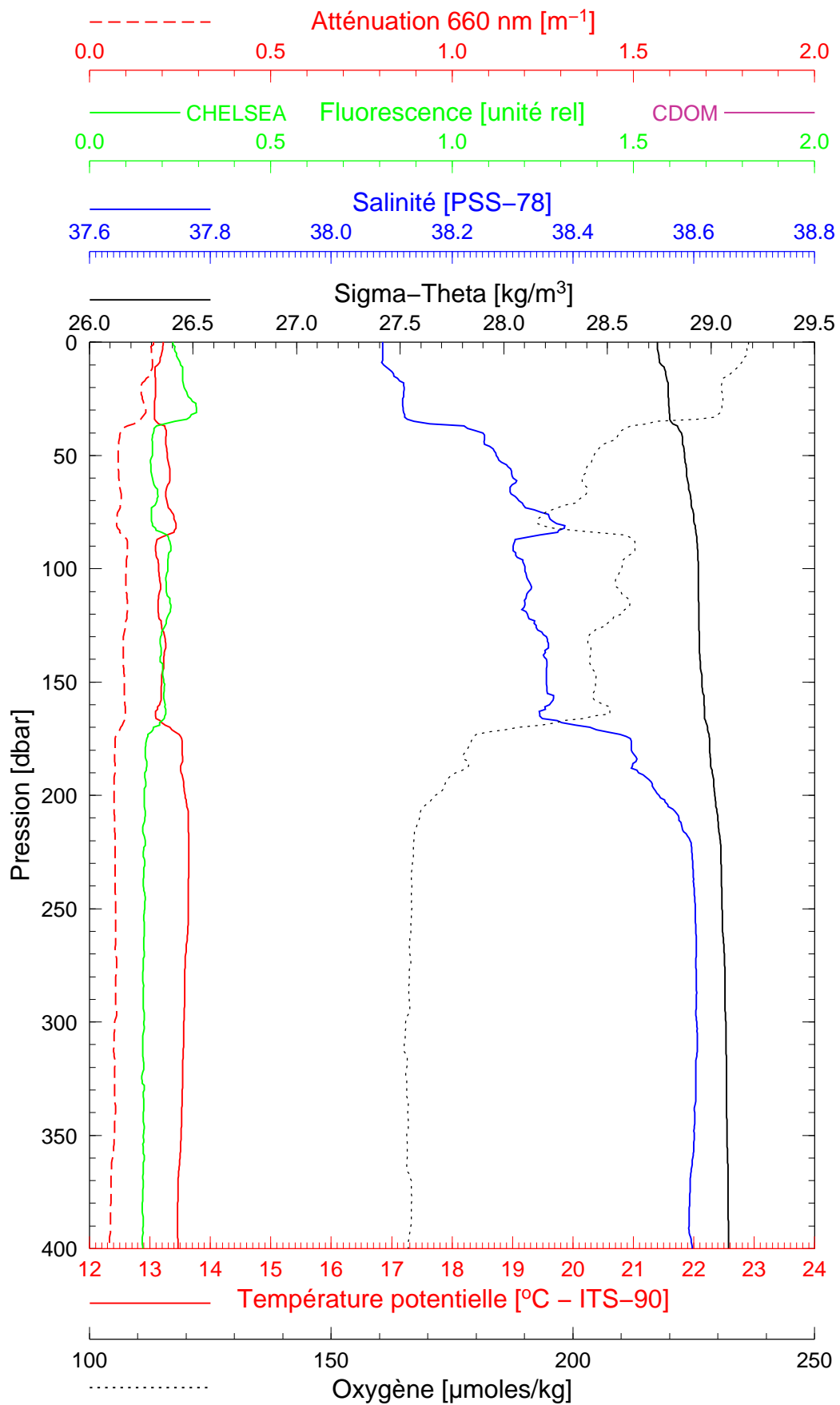
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BOUSSOLE 108

05/03/2011

BOUS110305_03

BOUS003



Date 05/03/2011
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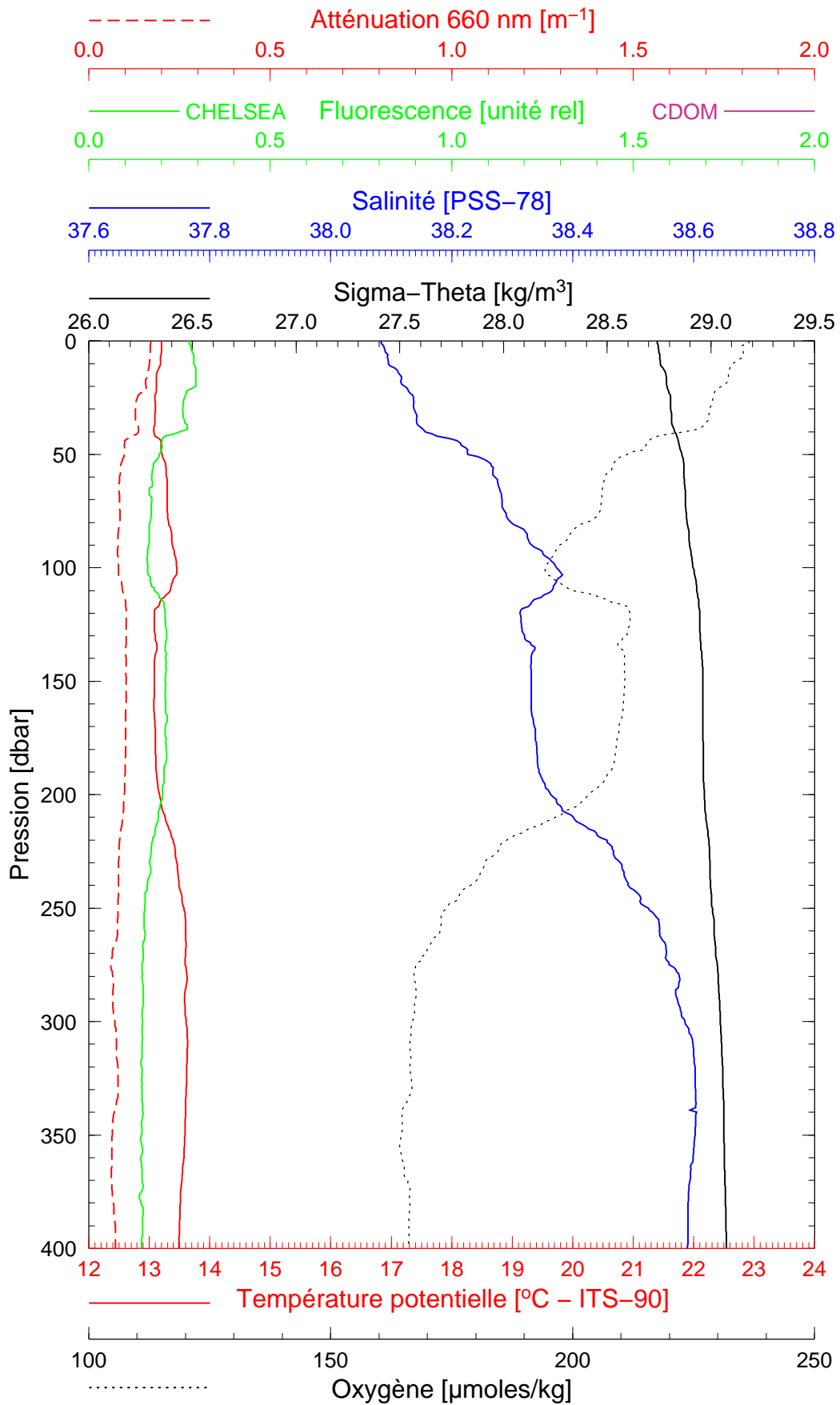
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BOUSSOLE 108

05/03/2011

BOUS110305_04

BOUS004



Date 05/03/2011
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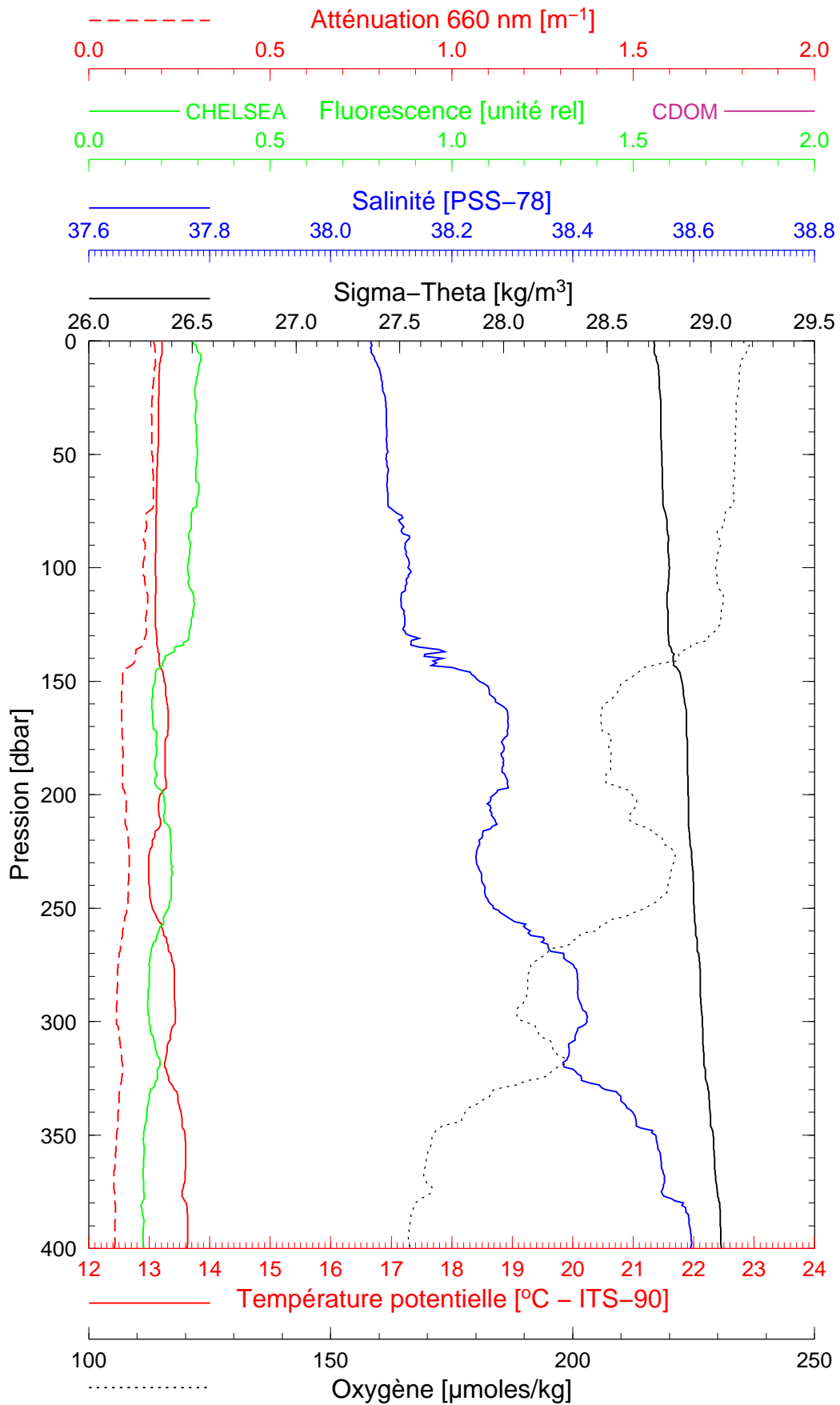
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BOUSSOLE 108

05/03/2011

BOUS110305_05

BOUS005



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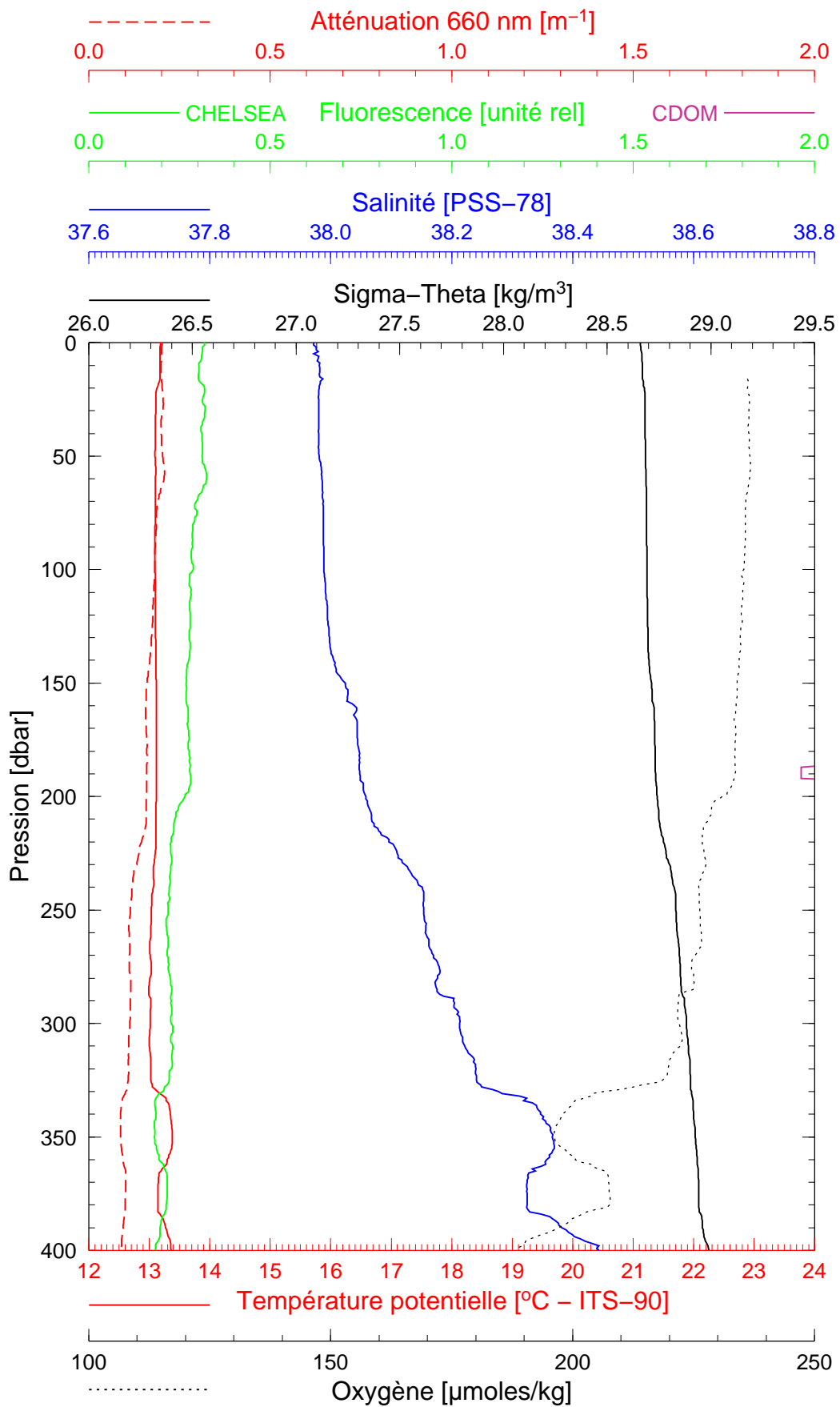
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BOUSSOLE 108

05/03/2011

BOUS110305_06

BOUS006



Date 05/03/2011
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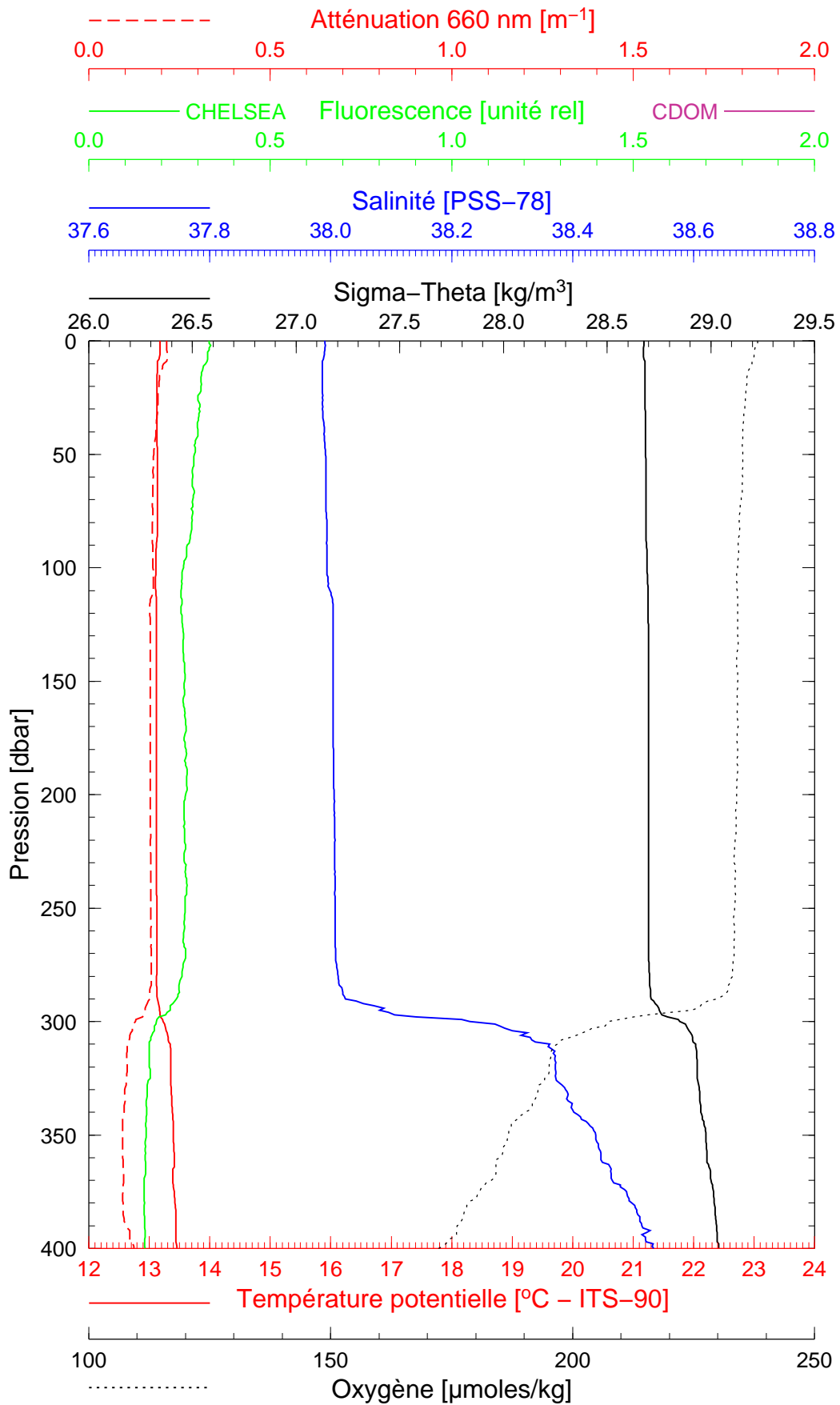
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BOUSSOLE 108

05/03/2011

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BOUS007



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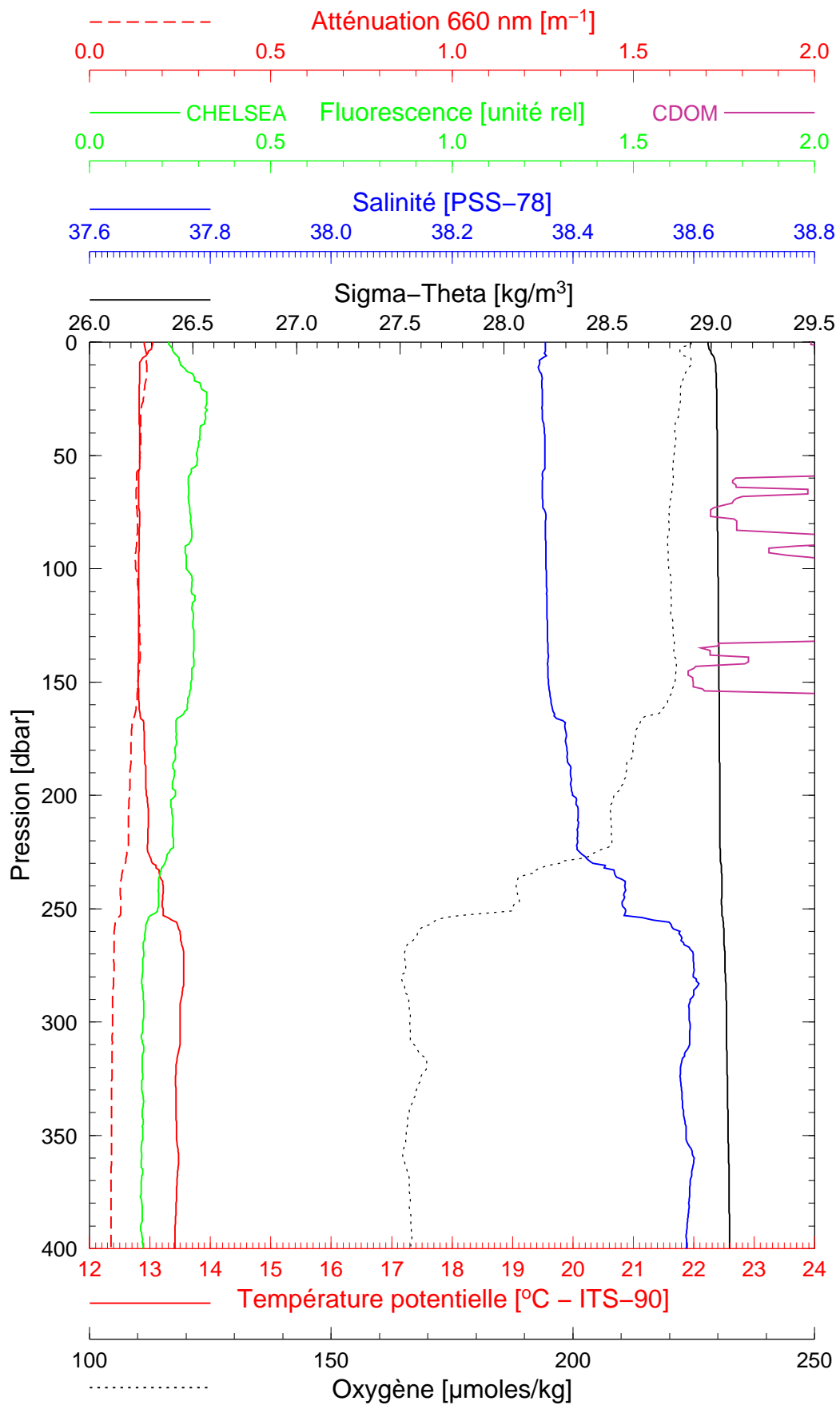
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BOUSSOLE 108

06/03/2011

BOUS110306_01

BOUS008



Date 06/03/2011
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Latitude 43°22.157 N
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