

BOUSSOLE Monthly Cruise Report

Cruise 105

December 10 - 13, 2010

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

Vessel: R/V Téthys II

(Captain: Rémy Lafond)

Science Personnel: Emilie Diamond, Olivier Javoy, Yves Lamblard, Grigor Obolensky, Vincent Taillandier, Vincenzo Vellucci, Luc and Pierre (divers), Marie and Shahrzad (students).

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



Figure 1. Waiting for divers in the dinghy with snow-covered Alps on background.

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

January 10, 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 gimbed 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 hydrophone of the CRC (Marineland) for identification of cetaceans has been installed under the sphere of the BOUSSOLE buoy and the strain sensor put back.

Cruise Summary

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

Friday 10 December 2010

The first day, weather conditions were correct though not being optimal (H1/3 around 1.2 m, wind speed 4 to 18 kn, blue sky and good visibility). At the BOUSSOLE site, 3 C-OPS and 3 SPMR profiles, 1 CTD cast with water sampling, 1 set of CIMEL measurements and 1 Secchi disk were performed. An attempt of CISCO connection failed. Then the transect was completed.

Saturday 11 December 2010

The second day, the sea was slight and the sky was blue, with a good visibility and a fresh breeze. When on site, an attempt of CISCO connection failed. Then divers went at sea to install the hydrophone and the strain sensor and to clean the instruments, which were quite dirty. ARGOS and CISCO connectors were also cleaned and a direct connection with the buoy was established for data retrieval after a reboot of the system through the AK connector. After, 1 Secchi disk, 2 sets of CIMEL measurements, 1 CTD cast with water sampling, 6 C-OPS and 1 SPMR profiles were performed.

Sunday 12 December 2010

The third day, weather conditions were correct though not being optimal (H1/3 1.0 to 1.2 m, light breeze, blue to overcast sky and good visibility). At the BOUSSOLE site, 2 CTD casts with water sampling and 9 C-OPS profiles were performed.

Monday 13 December 2010

The main cruise program was already done and the weather conditions were not optimal (H1/3 2.0 to 1.3 m during this day) so the departure from the Nice port was cancelled.

Cruise Report

Friday 10 December 2010 (UTC)

People on board: Emilie Diamond and Vincent Taillandier.

- 0705 Departure from the Nice port.
- 1035 Arrival at the BOUSSOLE site.
- 1040 Problems of connection with the SPMR.
- 1100 C-OPS 01, 02, 03.
- 1150 SPMR 01, 02, 03.
- 1250 CTD 01, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, Ap and TSM.
- 1315 Attempt of CISCO connection with the buoy: unsuccessful.
- 1330 CIMEL 01.
- 1345 Secchi disk 01 (18 m).
- 1350 Departure to the first transect station.
- 1425 CTD 02, 400 m, station 01 (43°25'N 07°48'E).
- 1525 CTD 03, 400 m, station 02 (43°28'N 07°42'E).
- 1625 CTD 04, 400 m, station 03 (43°31'N 07°37'E).
- 1725 CTD 05, 400 m, station 04 (43°34'N 07°31'E).
- 1820 CTD 06, 400 m, station 05 (43°37'N 07°25'E).
- 1910 CTD 07, 400 m, station 06 (43°39'N 07°21'E).
- 1940 Departure to the Nice port.
- 2005 Arrival at the Nice port.

Saturday 11 December 2010 (UTC)

People on board: Emilie Diamond, Grigor Obolensky, Vincent Taillandier, Vincenzo Vellucci and 4 divers.

- 0535 Departure from the Nice port.
- 0850 Arrival at the BOUSSOLE site.
- 0915 Attempt of CISCO connection with the buoy: unsuccessful.
- 0930 Diving on the buoy for cleaning instruments and for installing the strain sensor and the hydrophone.
- 0940 Direct CISCO connection with buoy and data retrieval after a reboot of the system through the AK connector. Solar panels, instruments, CISCO and ARGOS connections cleaned on the top of the buoy.
- 0940 Secchi disk 02 (16 m).
- 0945 CIMEL 02, 03.
- 1030 CTD 08, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, Ap, CDOM and TSM.
- 1050 C-OPS 04, 05, 06.
- 1220 SPMR 04: no more connection with the instrument after.
- 1310 C-OPS 07, 08, 09.
- 1415 Departure to the Nice port.
- 1720 Arrival at the Nice port.

Sunday 12 December 2010 (UTC)

People on board: Emilie Diamond, Grigor Obolensky and 2 students.

- 0610 Departure from the Nice port.
- 0935 Arrival at the BOUSSOLE site.

0945 CTD 09, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC and Ap: the fuse of the deck-unit blew at the beginning of the up cast so 2 different AC9 files.

1030 C-OPS 10, 11, 12.

1110 C-OPS 13, 14, 15.

1210 CTD 10, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, Ap and TSM.

1300 C-OPS 16, 17, 18.

1345 Departure to the Nice port.

1640 Arrival at the Nice port.

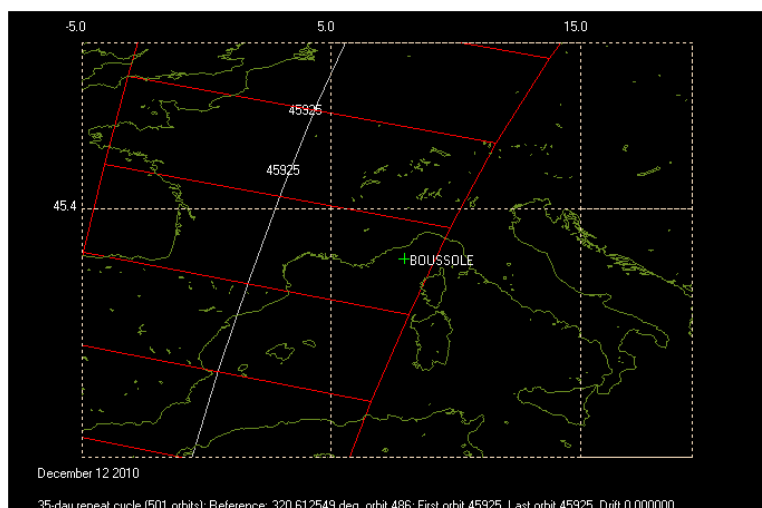
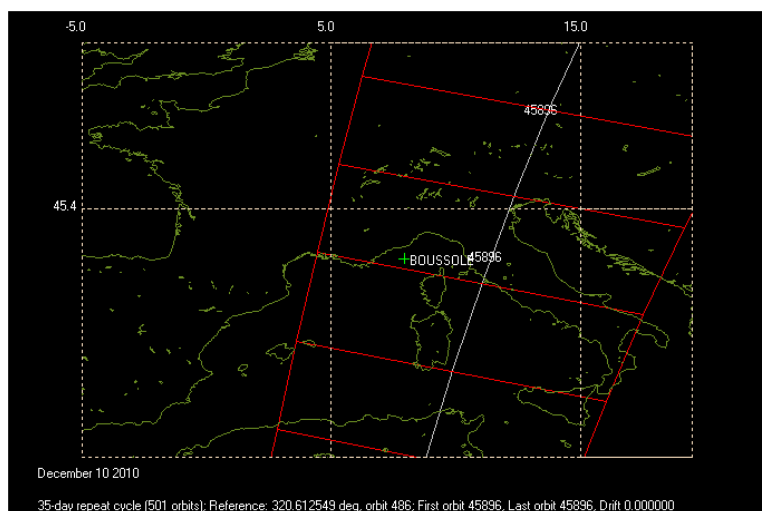
Monday 13 December 2010

Not optimal weather conditions prevented departure from the Nice port.

Problems identified during the cruise

- The connection with the SPMR was lost after some profiles and the fuse of its deck-unit blew several times too. The problem came from the connector on the instrument.
- During the beginning of the CTD 09 up cast, the deck-unit fuse blew. It has been changed and the up cast recorded normally but with a new run number for AC9.
- Not optimal weather conditions of the last day prevented departure from the Nice port.

Calculated Swath paths for the MERIS Sensor (ESOV Software)



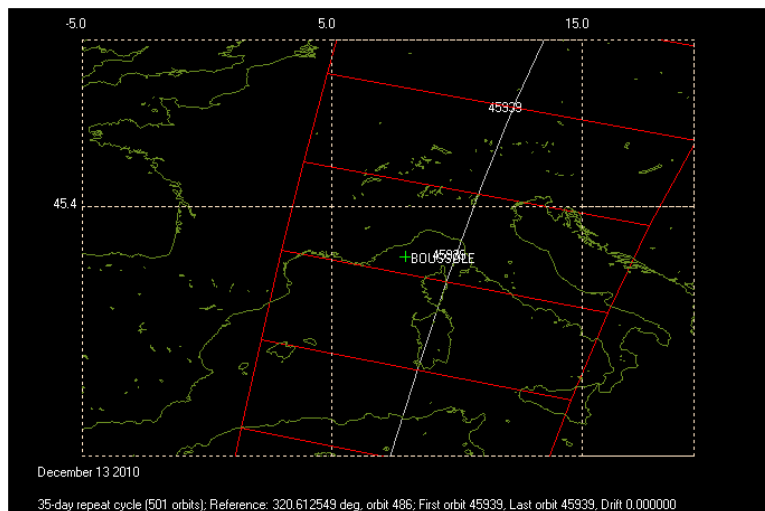
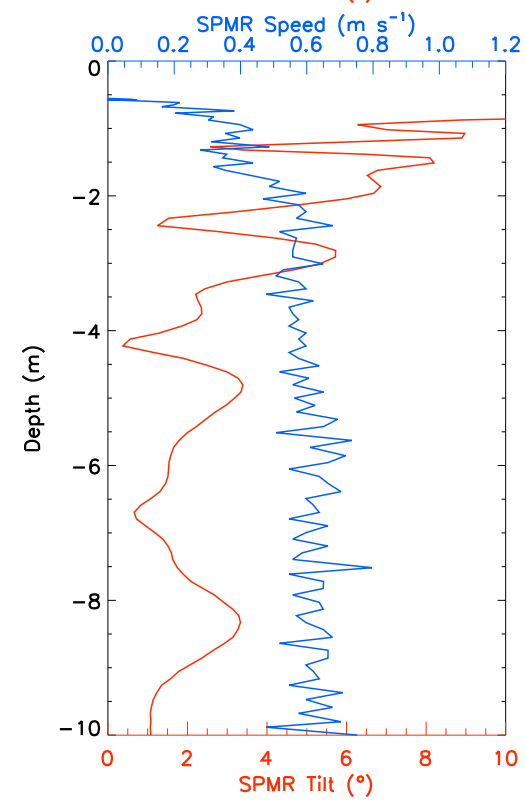
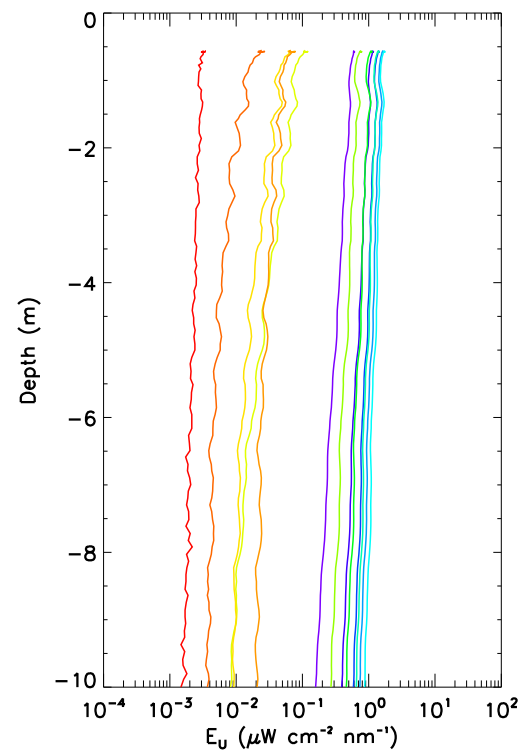
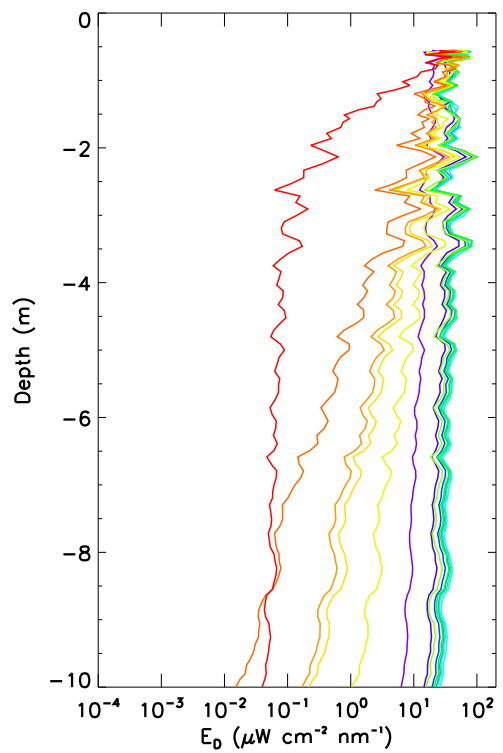
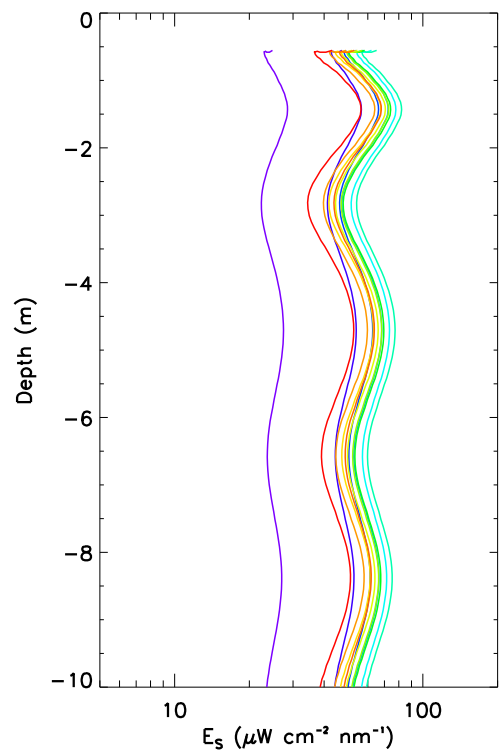
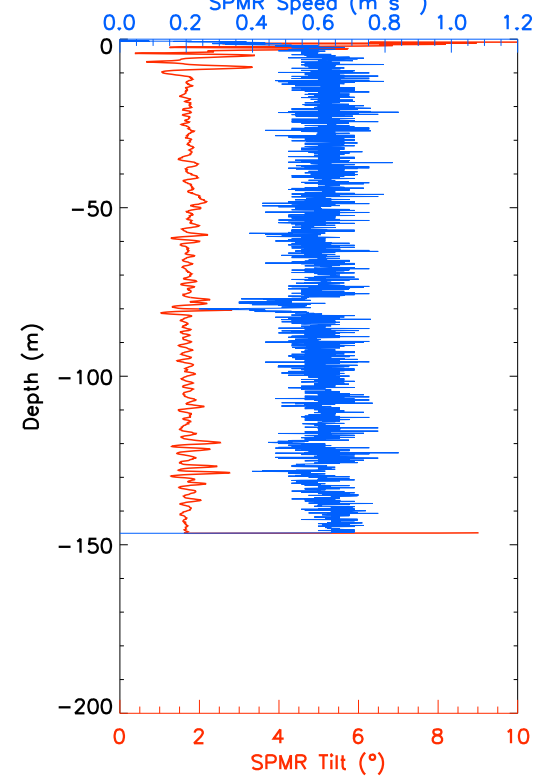
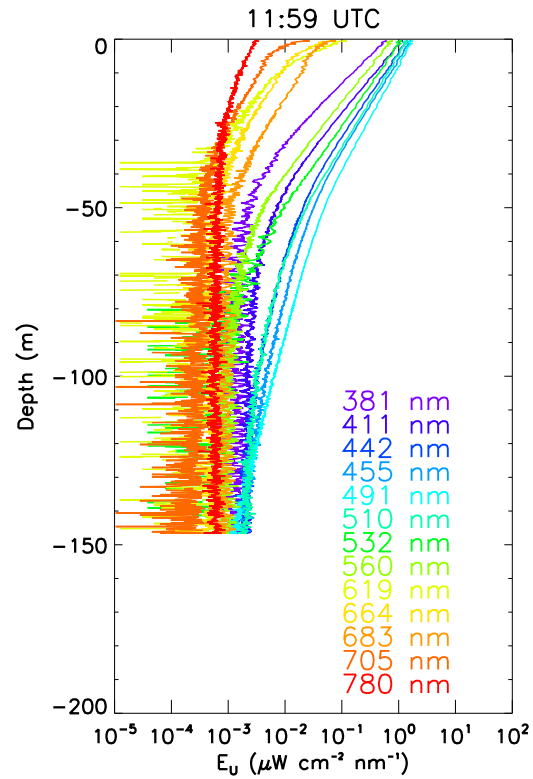
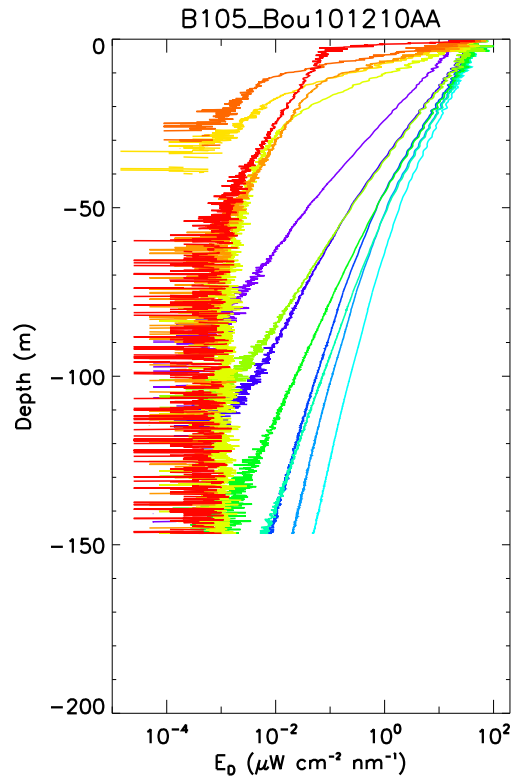
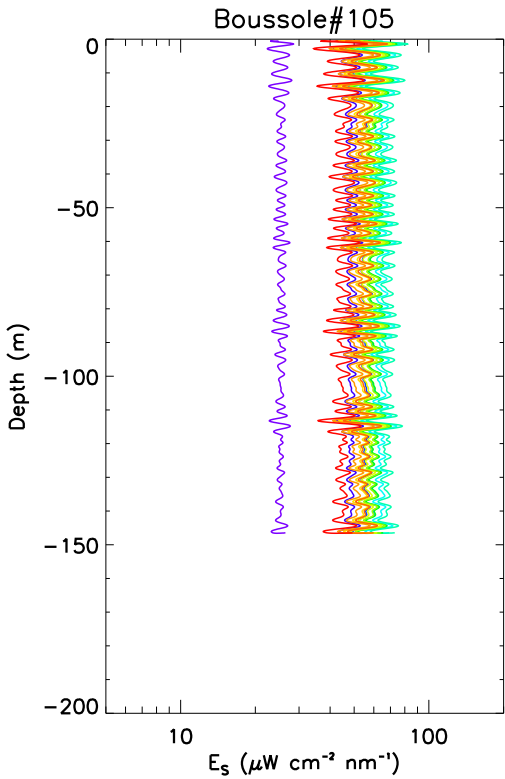
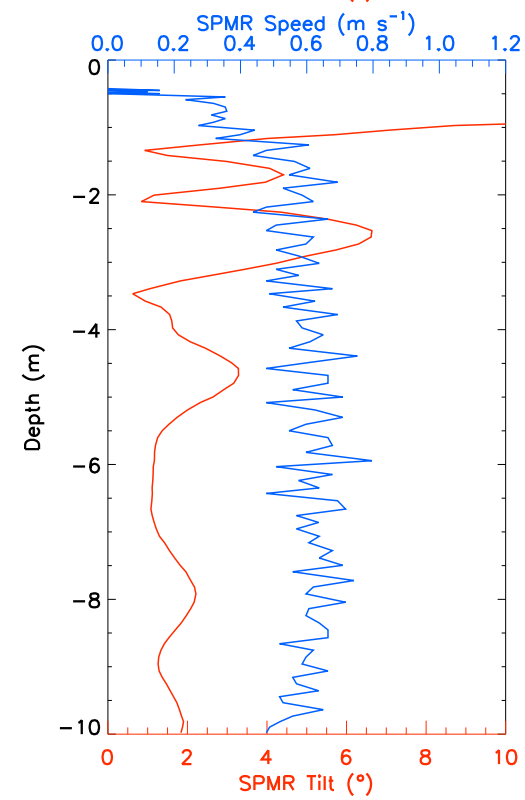
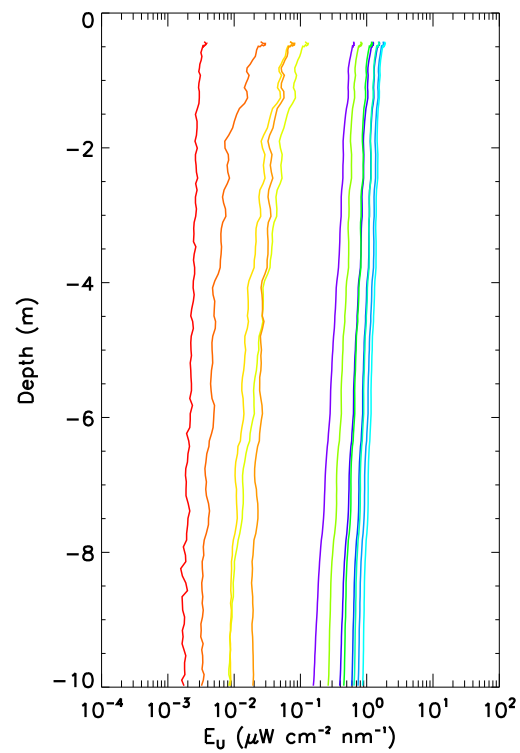
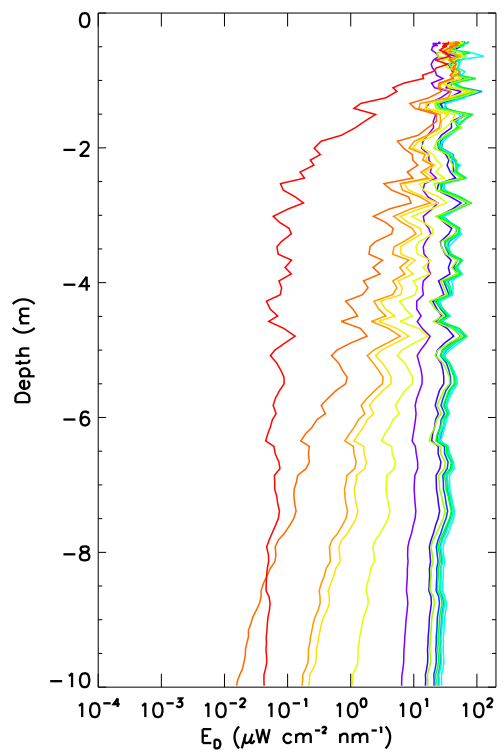
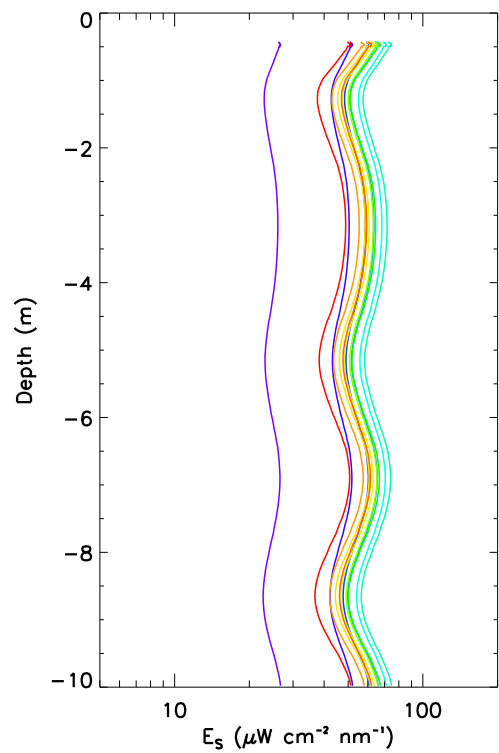
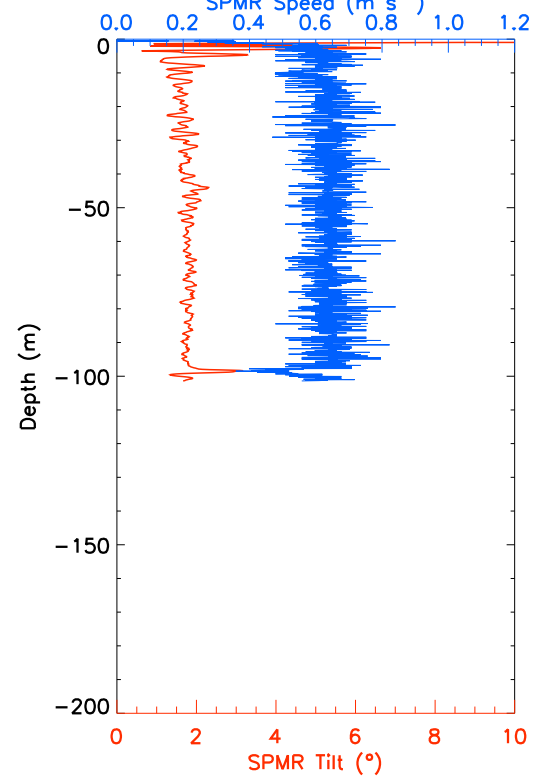
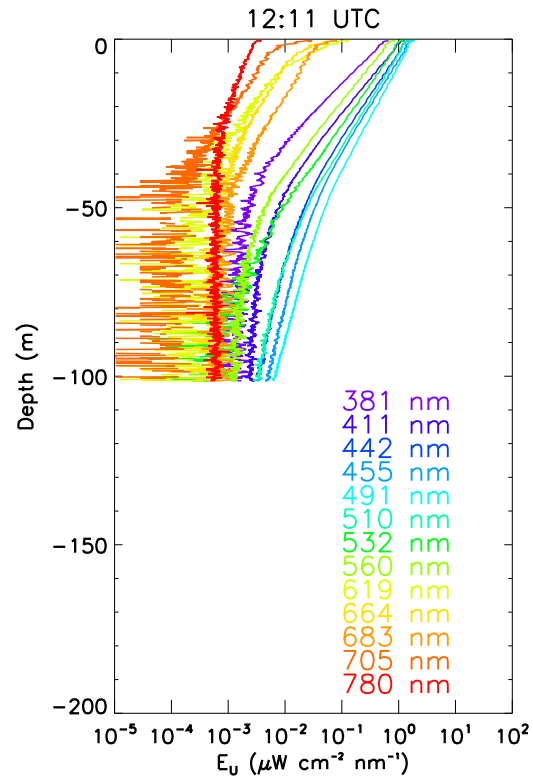
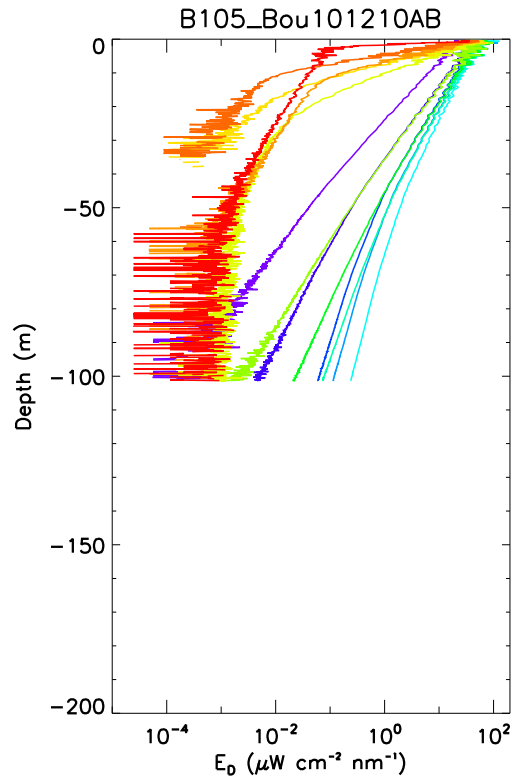
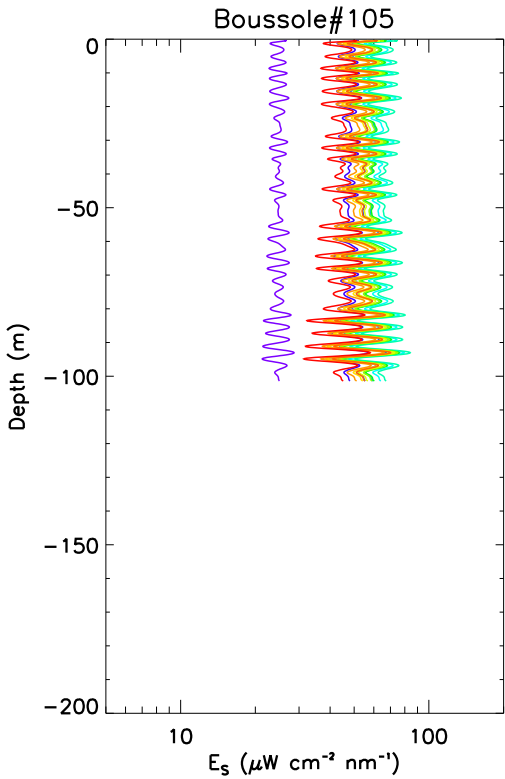


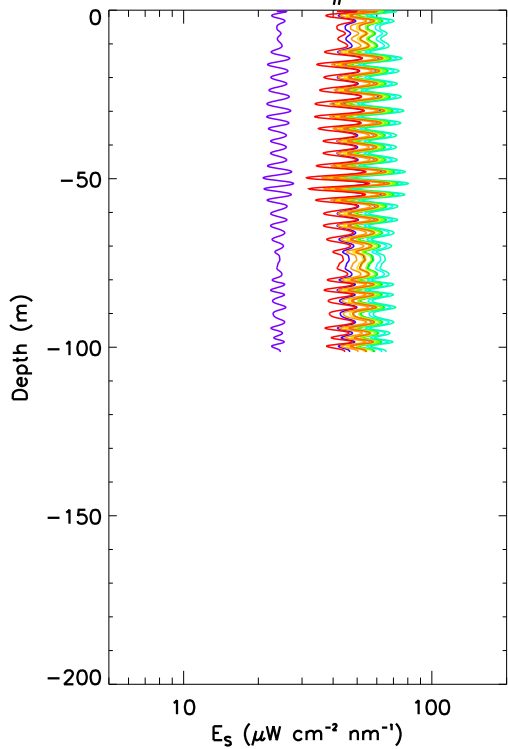
Figure 2. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for 10th, 12th and 13th December 2010.

Appendix

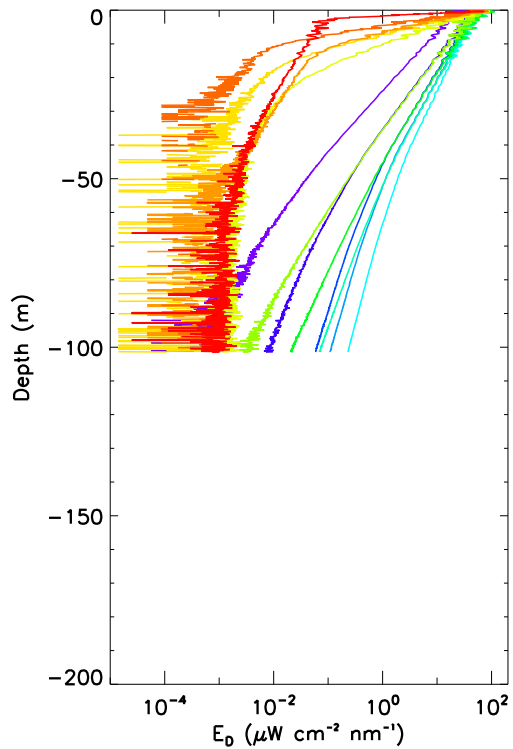




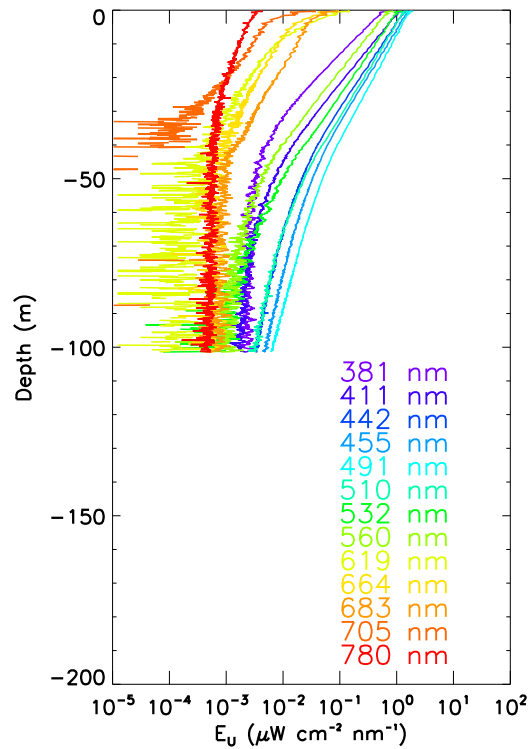
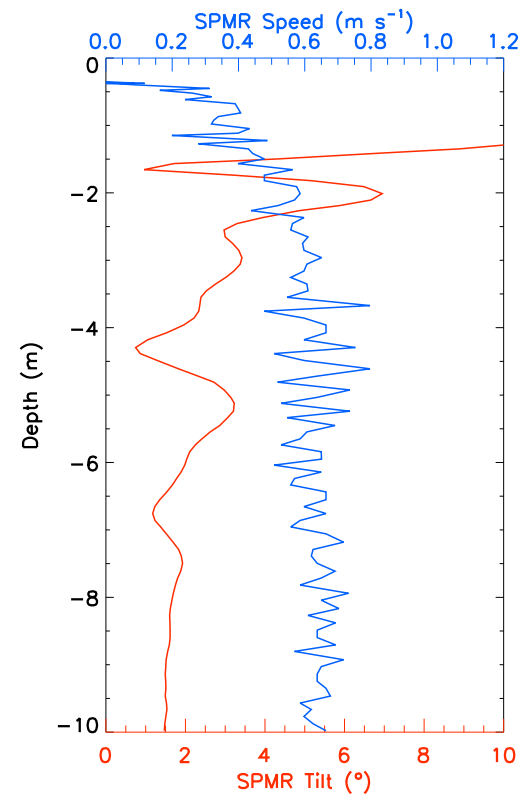
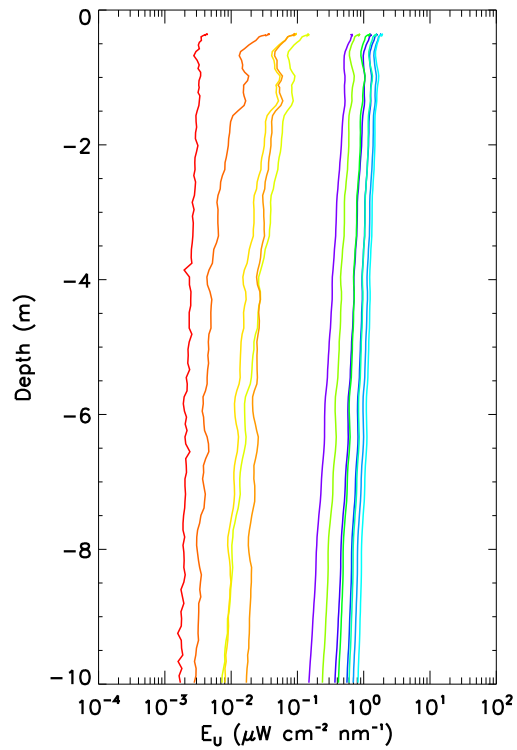
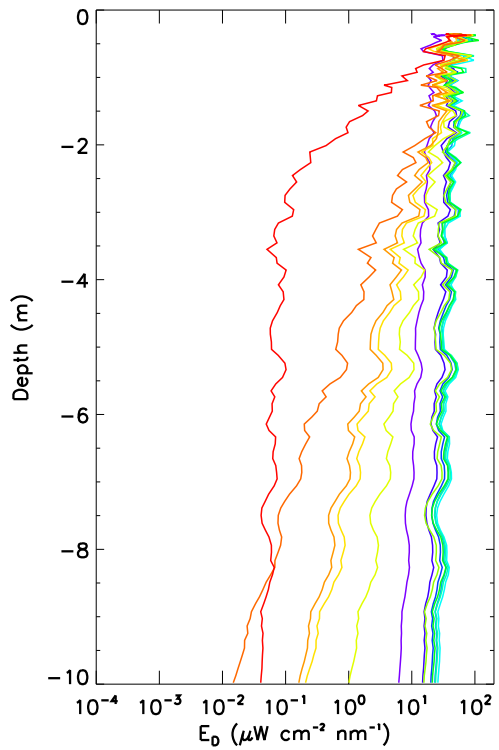
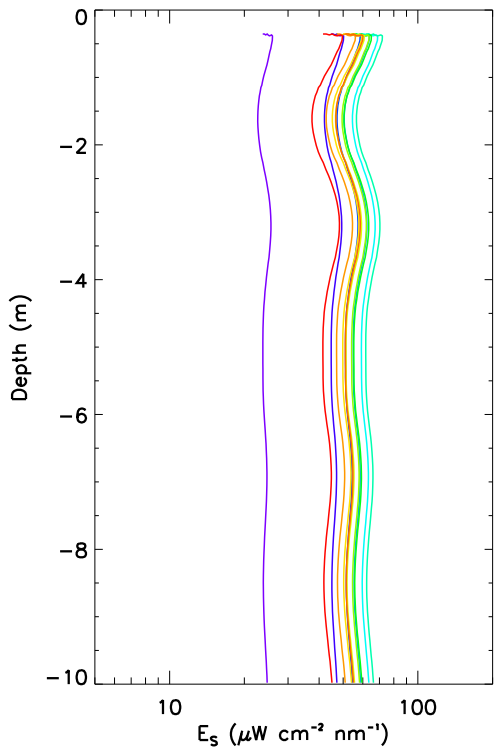
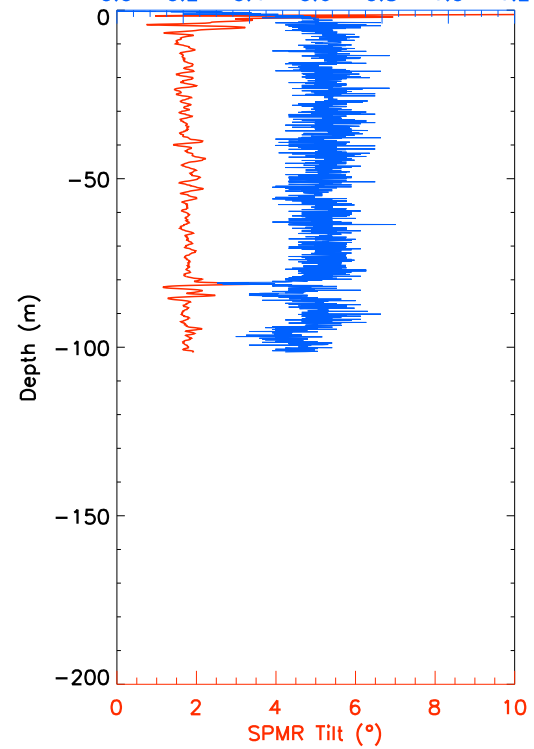
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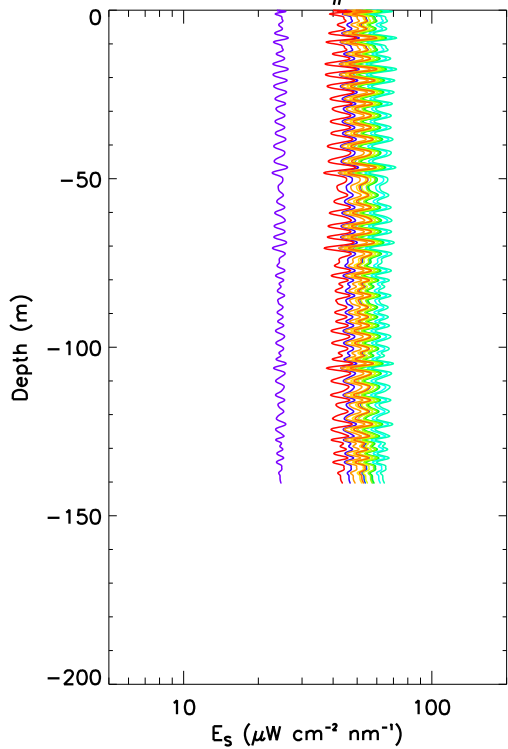
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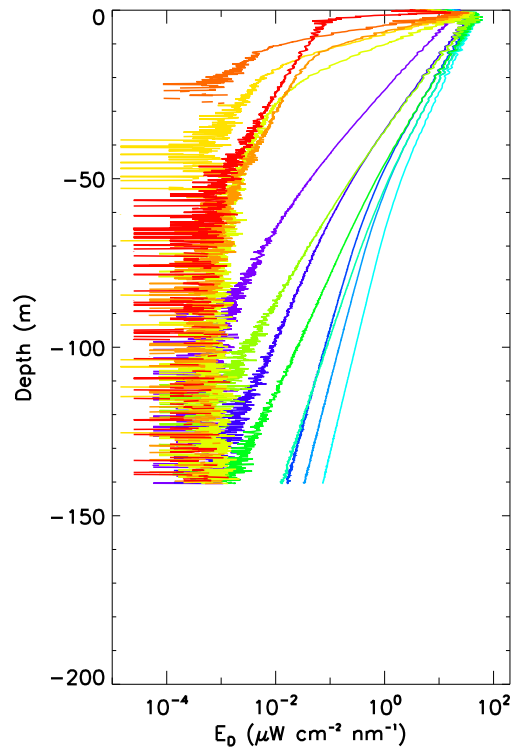
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SPMR Speed (m s^{-1})

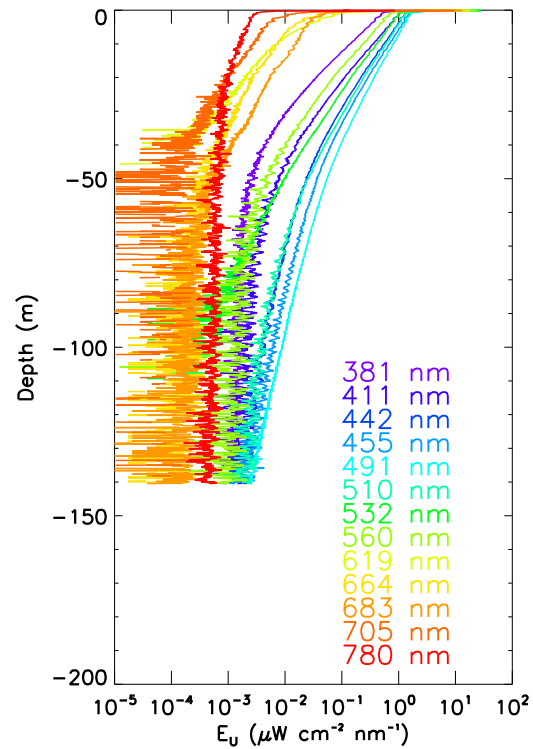
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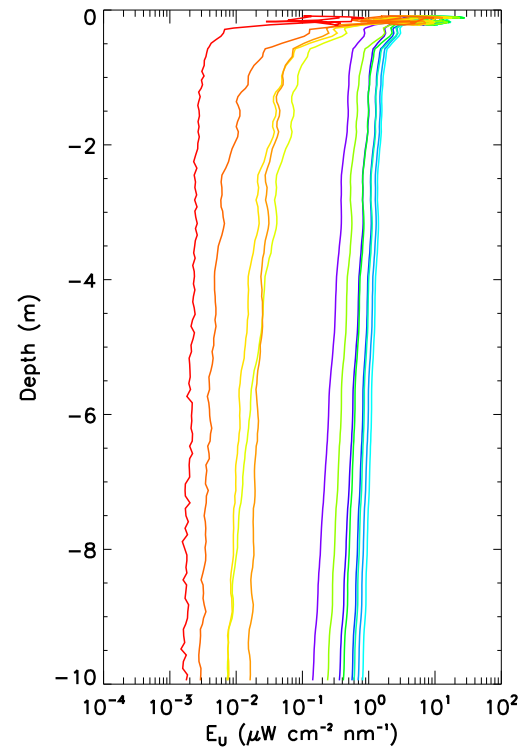
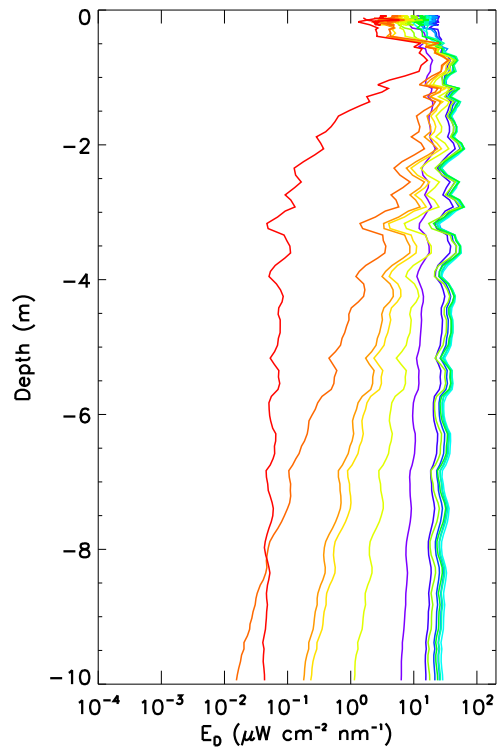
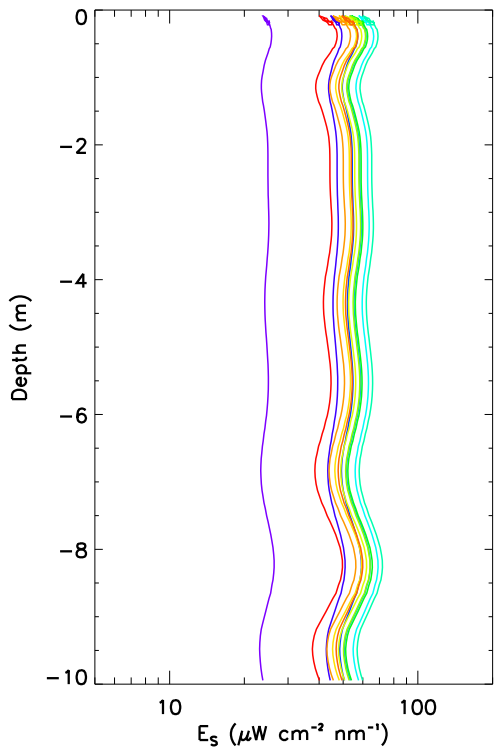
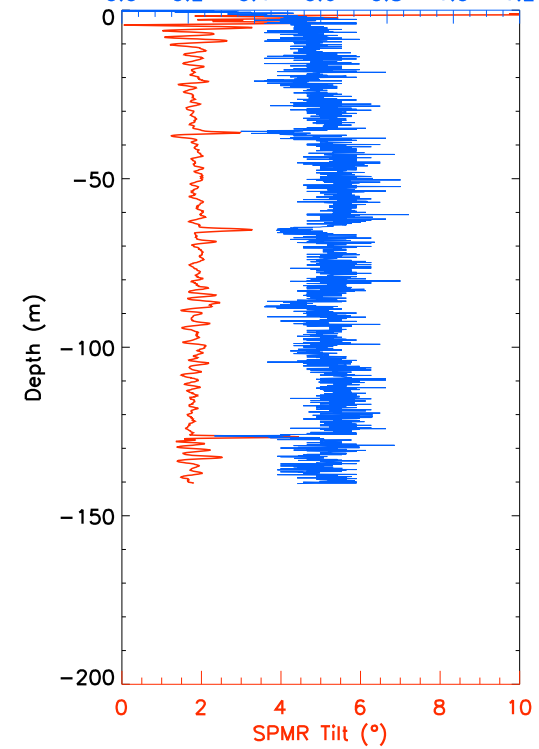
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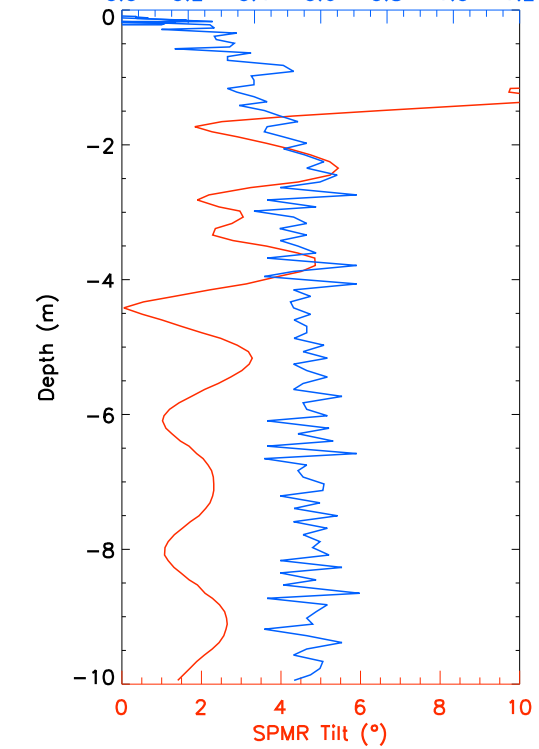
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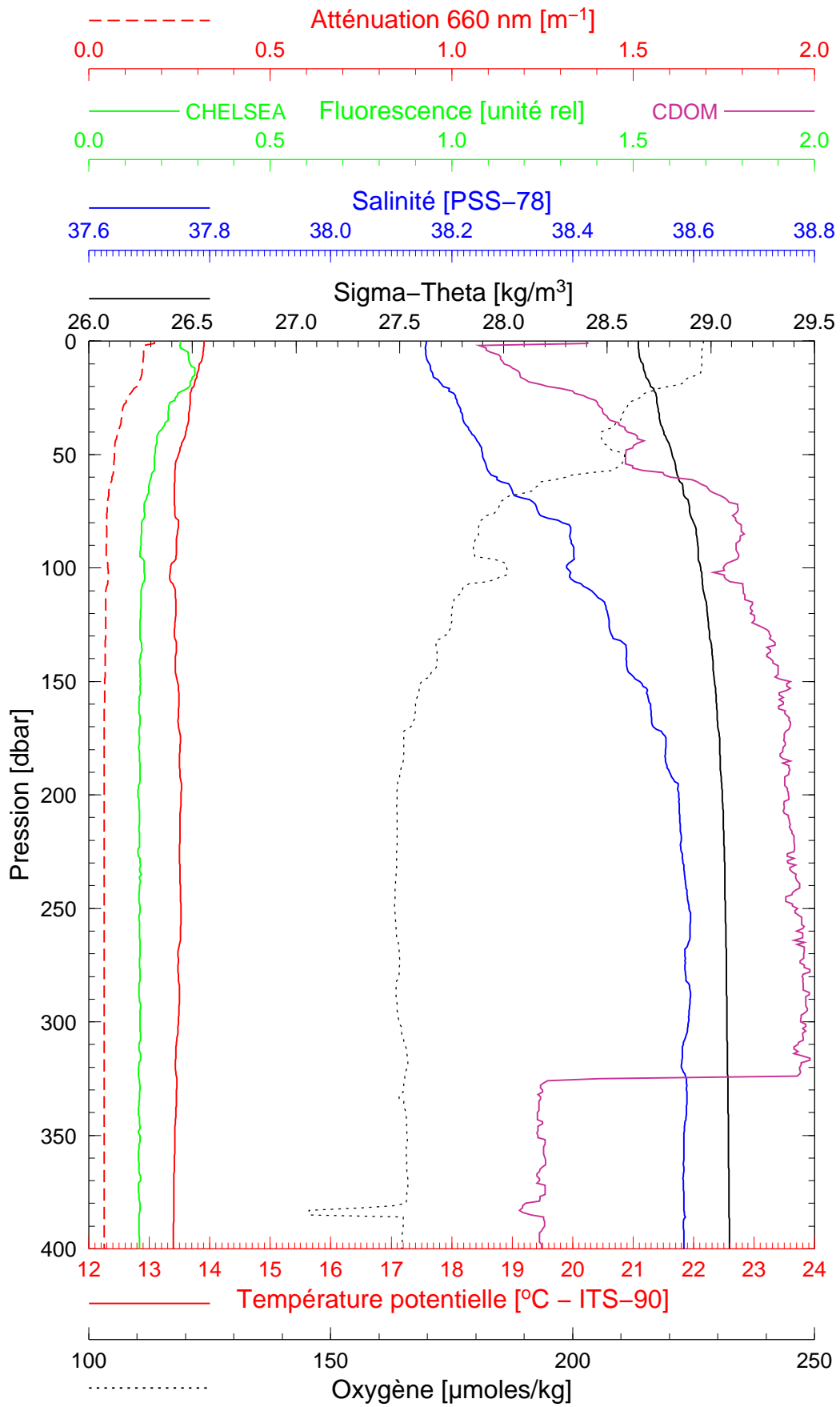


BOUSSOLE 105

10/12/2010

BOUS101210_01

BOUS001



Date 10/12/2010
Heure déb 12h 52min [TU]

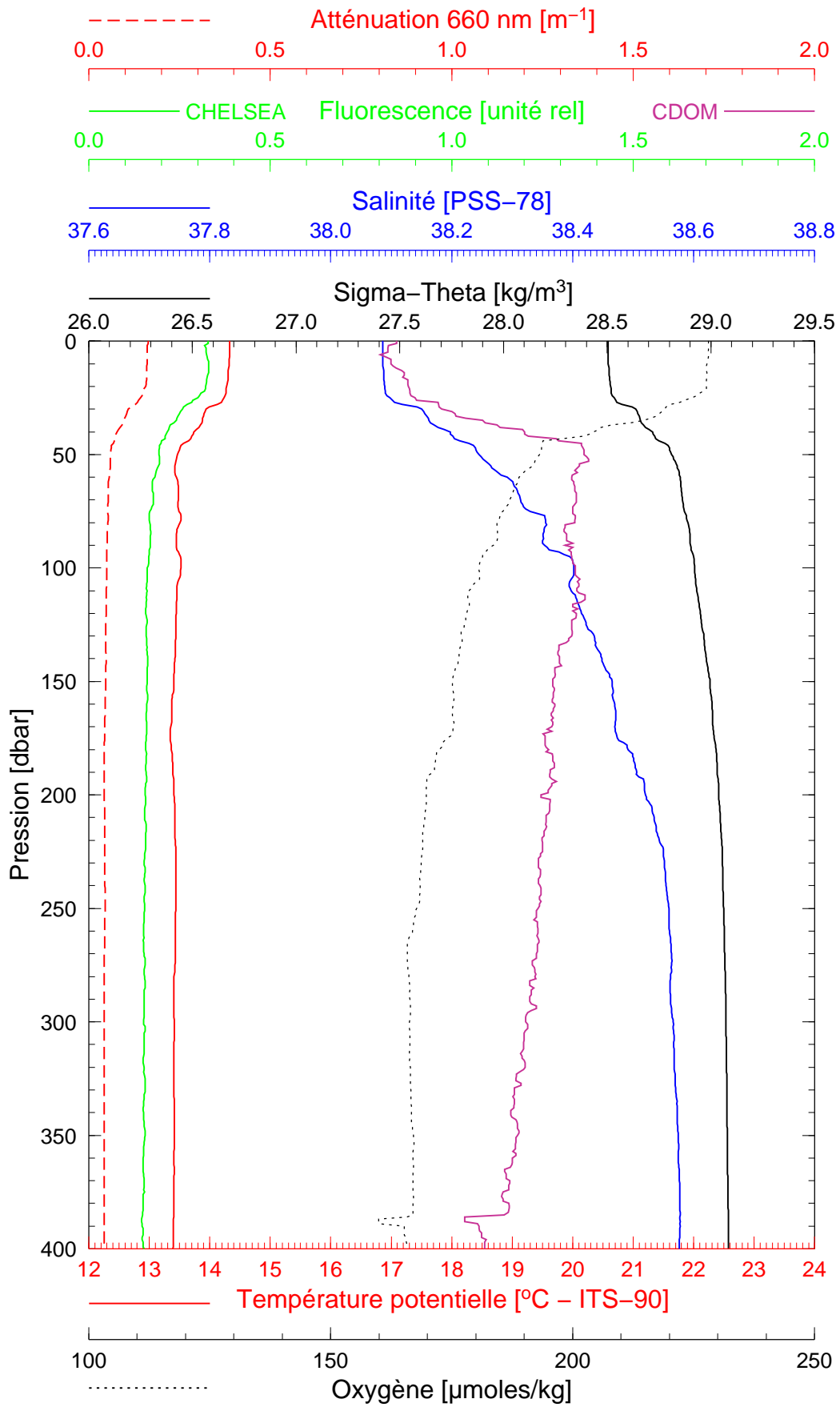
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BOUSSOLE 105

10/12/2010

BOUS101210_02

BOUS002



Date 10/12/2010

Latitude 43°25.071 N

Heure déb 14h 29min [TU]

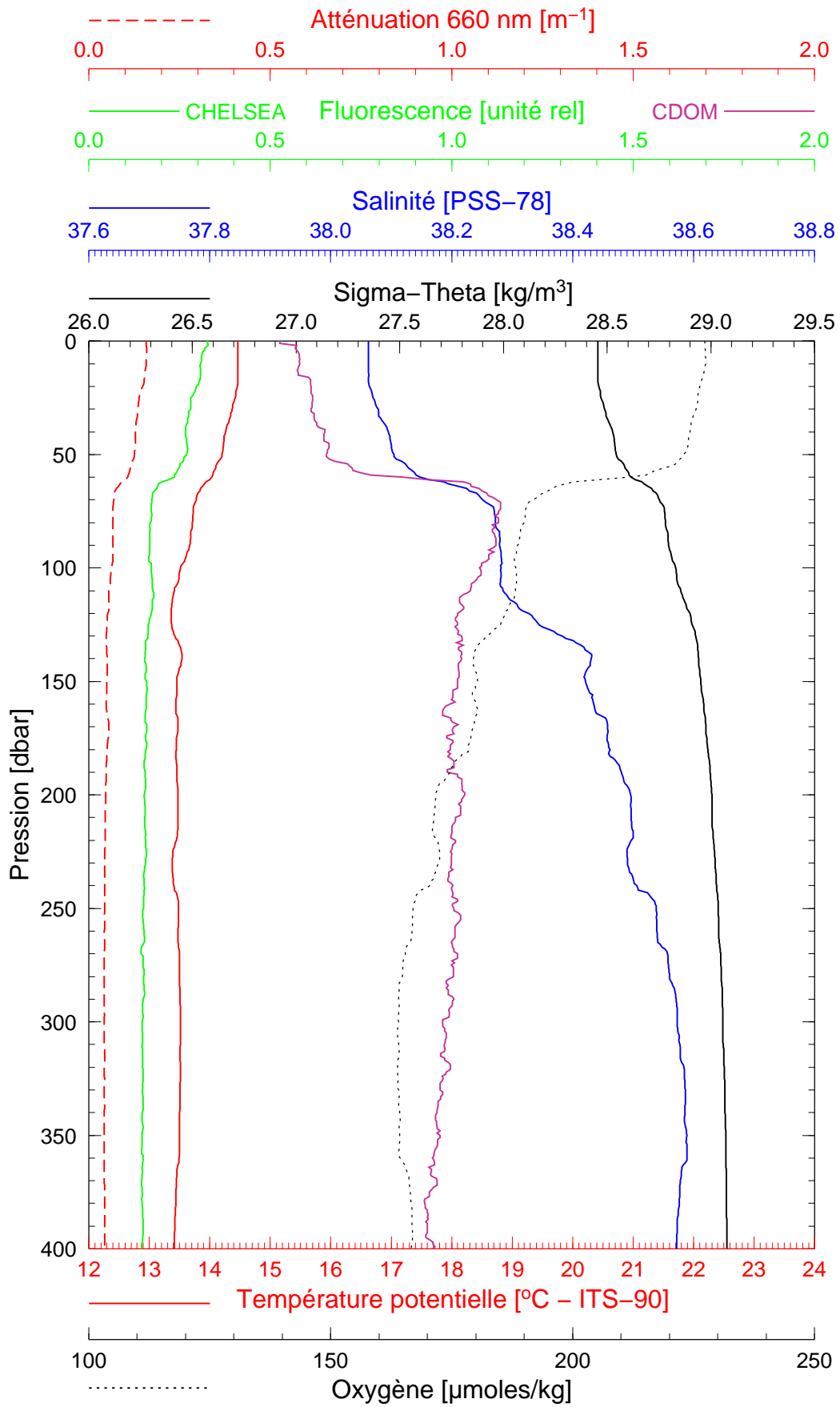
Longitude 07°48.052 E

BOUSSOLE 105

10/12/2010

BOUS101210_03

BOUS003



Date 10/12/2010

Latitude 43°27.967 N

Heure déb 15h 30min [TU]

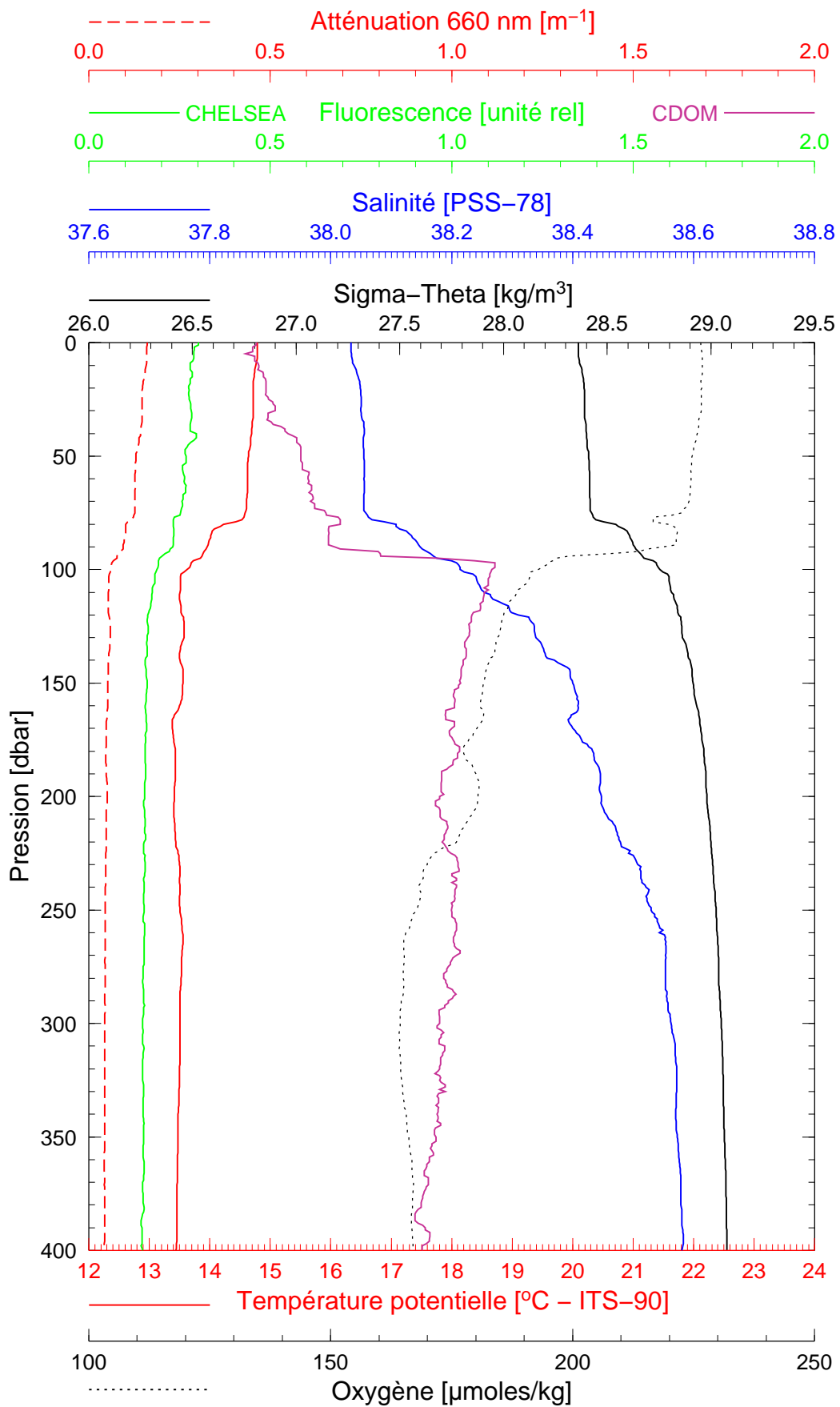
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BOUSSOLE 105

10/12/2010

BOUS101210_04

BOUS004



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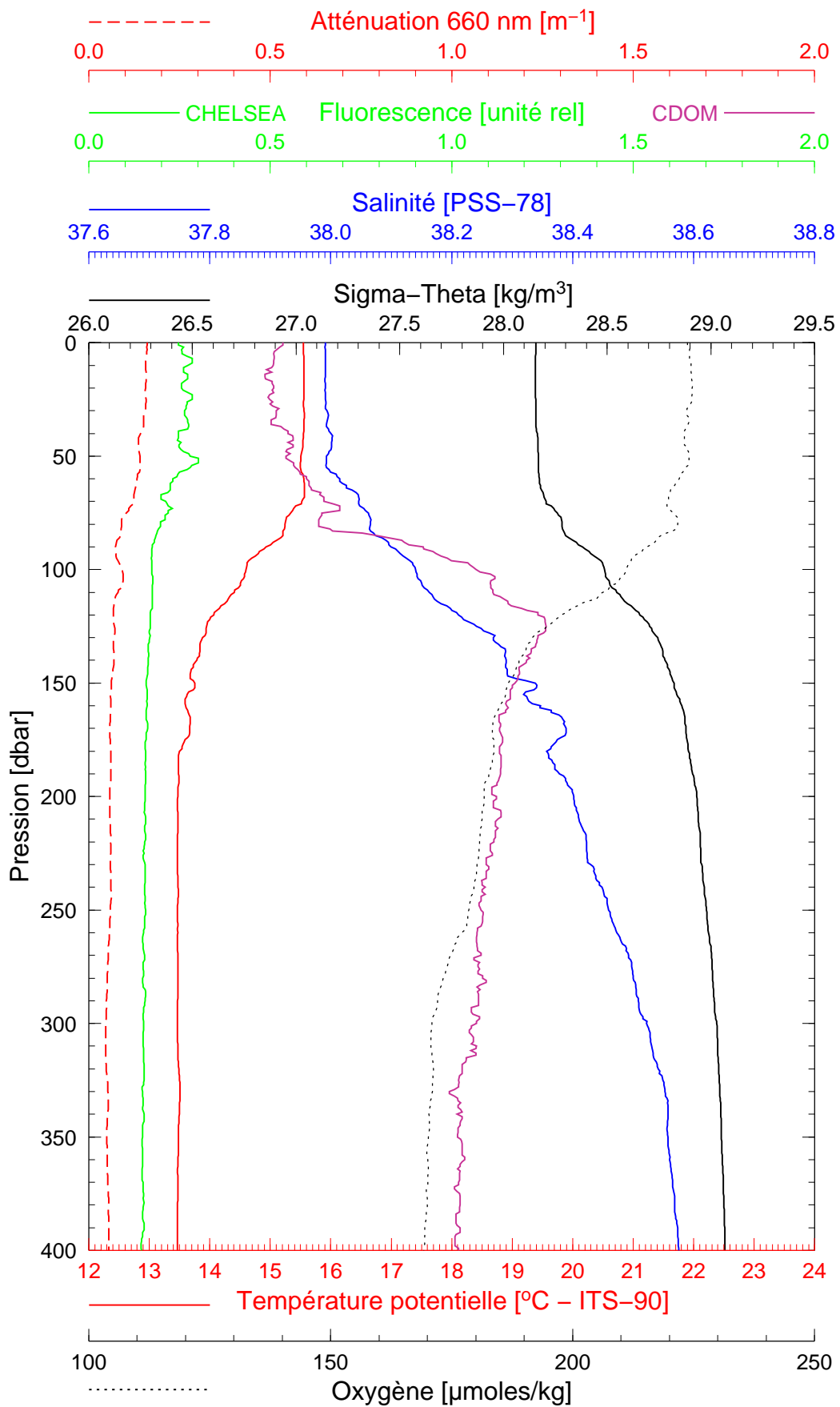
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BOUSSOLE 105

10/12/2010

BOUS101210_05

BOUS005



Date 10/12/2010

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Heure déb 17h 27min [TU]

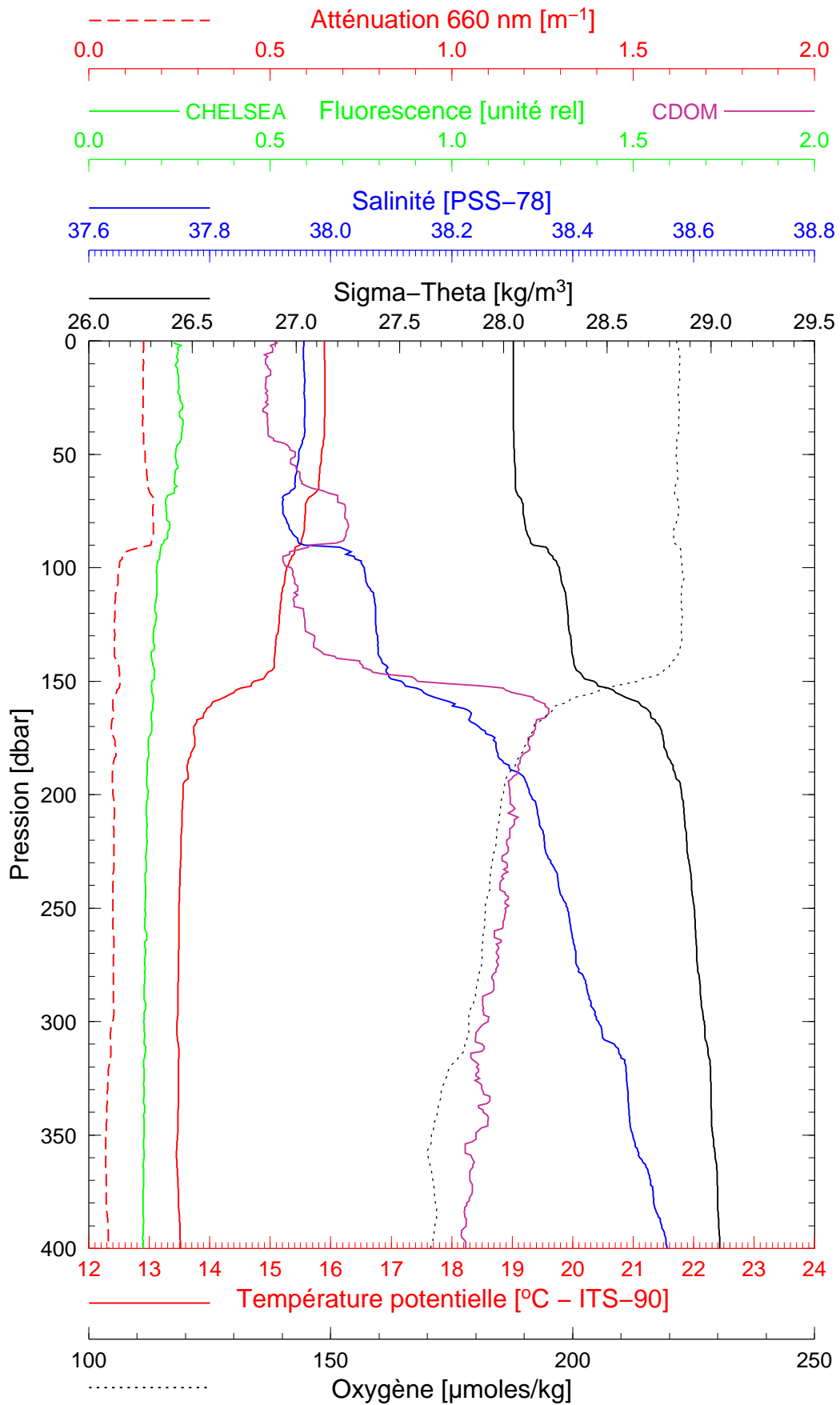
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BOUSSOLE 105

10/12/2010

BOUS101210_06

BOUS006



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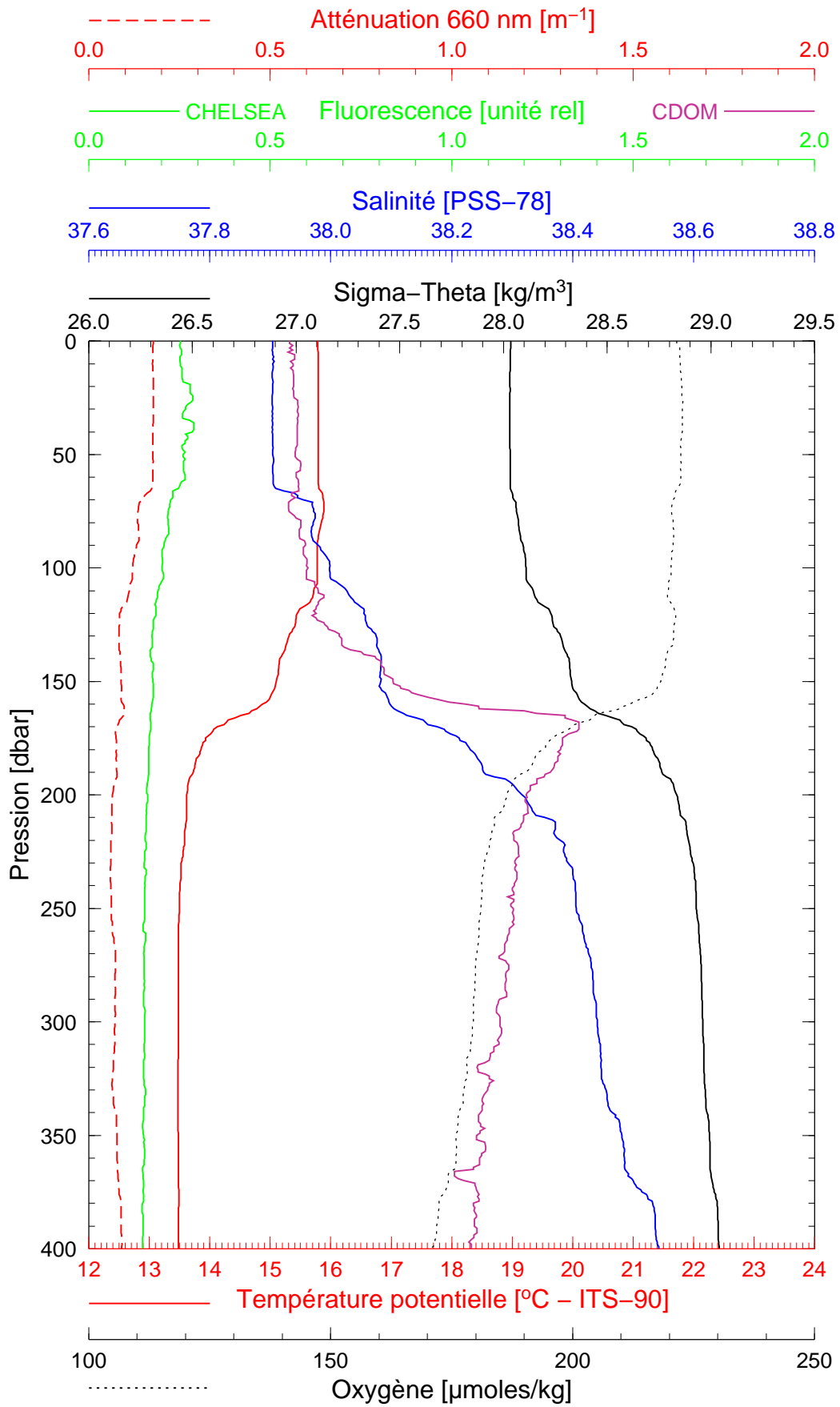
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BOUSSOLE 105

10/12/2010

BOUS101210_07

BOUS007



Date 10/12/2010

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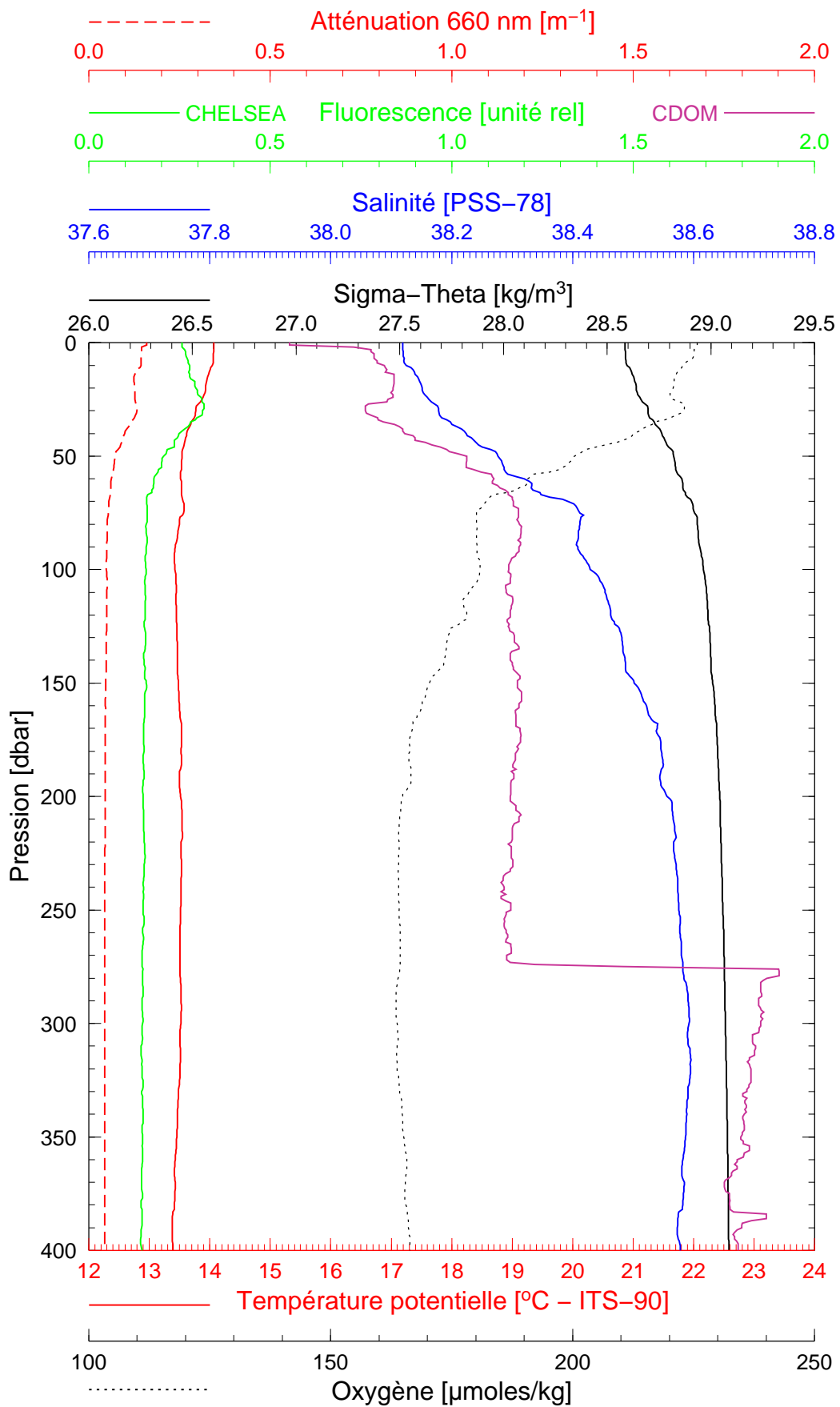
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BOUSSOLE 105

11/12/2010

BOUS101211_01

BOUS008



Date 11/12/2010

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Latitude 43°22.079 N

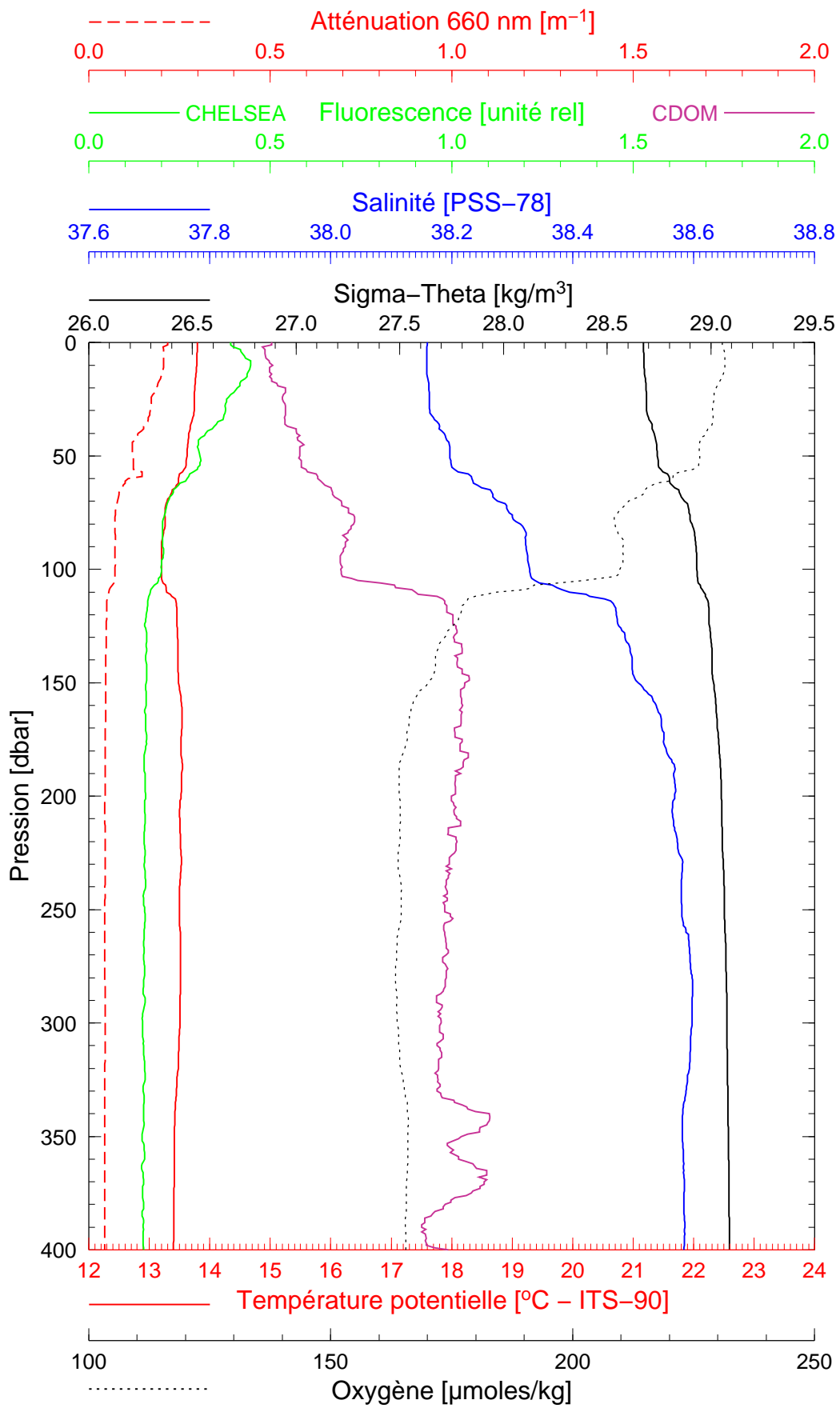
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BOUSSOLE 105

12/12/2010

BOUS101212_01

BOUS009



Date 12/12/2010
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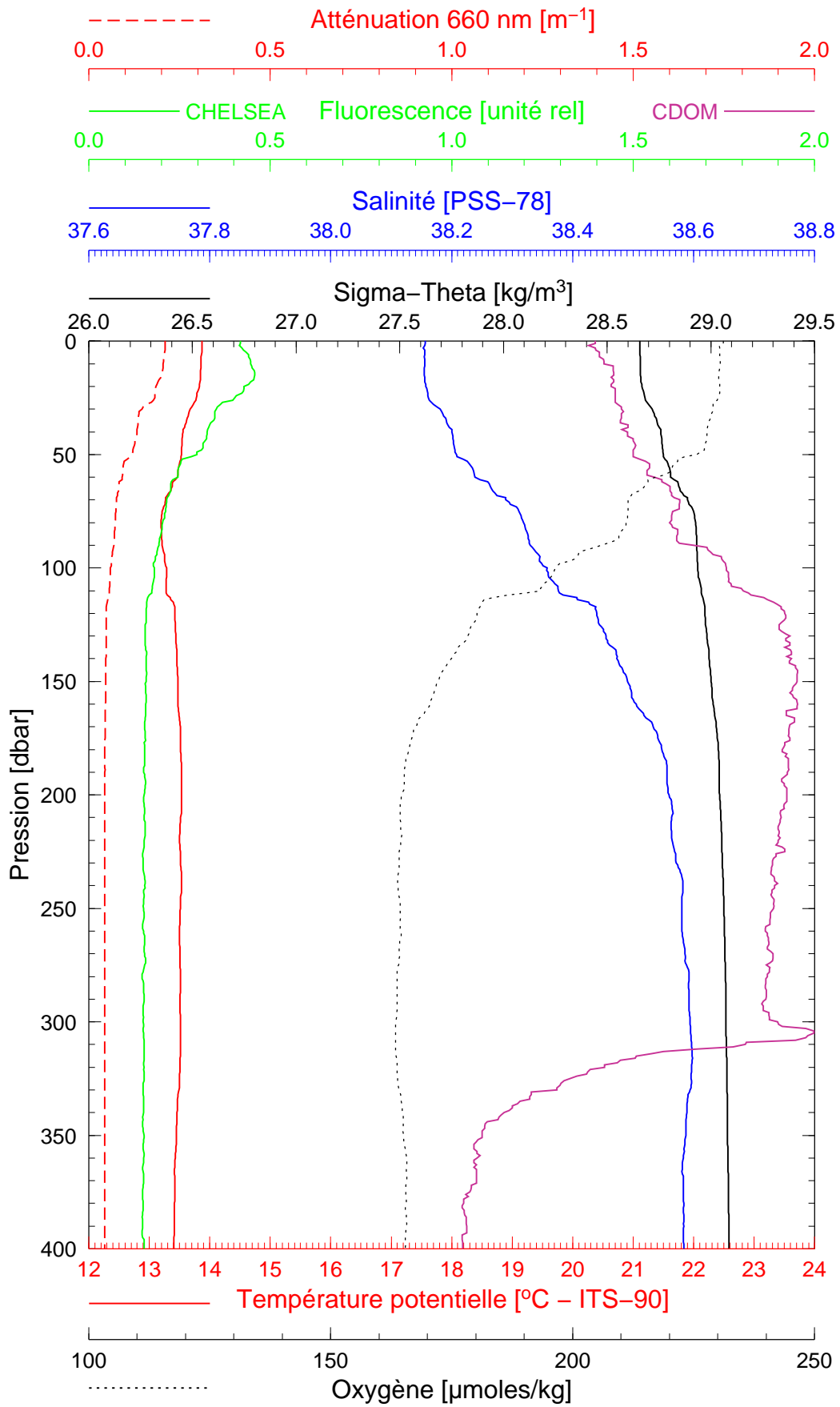
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BOUSSOLE 105

12/12/2010

BOUS101212_02

BOUS010



Date 12/12/2010

Latitude 43°22.240 N

Heure déb 12h 14min [TU]

Longitude 07°53.625 E