

# BOUSSOLE Monthly Cruise Report

## Cruise 98

May 10 - 14, 2010

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

Vessel: R/V Téthys II

(Captain: Rémy Lafond then Alain Stephan)

Science Personnel: Alain Cariou, Emilie Diamond, Yves Lamblard, Raymond Le Guen, David Luquet, Stéphane Marchand, Grigor Obolensky, Vincent Taillandier, Vincenzo Vellucci et Emmanuel.

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



Figure 1. Alain Cariou and Raymond Le Guen on Météo-France weather buoy for maintenance.

## BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

May 17, 2010



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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 N<sub>2</sub> 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**

Since the 12<sup>th</sup> of April 2010, data from instruments connected to the buoy OCP at 4m were sending constant values; when on board, divers changed the OCP-Dacnet cable to attempt to solve this problem. The 2<sup>nd</sup> day, Alain Cariou and Raymond Le Guen from Météo-France were on board for their weather buoy maintenance. Grigor Obolensky was also on board to perform a PVM 0-1000 m profile and 2 plankton nets near the Météo-France buoy. The deep CTD for MOOSE (Mediterranean Ocean Observation multi-Sites on Environment) was also performed this day at BOUSSOLE site.

## **Cruise Summary**

Three of the four cruise days were used. The third day, restrictions from the port authorities prevented the departure. The first cruise day was normally planned for MOOSE mission but it was exchanged with a BOUSSOLE day because of the absence of MOOSE duty chief. This day was used for diving operations, buoy data retrieval, CTD cast with sampling at the BOUSSOLE site and for completing the transect. The second day was used for the MOOSE program and also BOUSSOLE optical casts. The last day was used for buoy data retrieval, optical and CTD casts with sampling at the BOUSSOLE site.

### **Monday 10 May 2010**

The first day, sea state was good with some wind blowing. The sky was blue with however some clouds. When on site, divers went at sea for cleaning the instruments and changing the OCP-Dacnet cable at 4m. They also cleaned the instruments and put neoprene caps on the HS4 and on the transmissometers for acquiring three dark measurements. ARGOS and CISCO connectors were also cleaned. A direct connection with the buoy was established for data retrieval. The transect was then completed.

## Tuesday 11 May 2010

The second day, sea state was good with some wind blowing and overcast sky. Two employees of Météo-France repaired their weather buoy not far from BOUSSOLE site. Then, 2 plankton net samples were collected and 1 PVM profile was performed. At the BOUSSOLE site, 1 deep CTD cast with water sampling, 3 C-OPS and 3 SPMR profiles were performed.

## Wednesday 12 May 2010

Restrictions from the port authorities prevented departure from the Nice port. Zonex 26 and 28 were not allowed.

## Thursday 13 May 2010

Changing of the Téthys II crew.

## Friday 14 May 2010

Weather conditions were rough all along the day on large (H1/3 1.5 m, wind speed 15 kn). The sky was overcast the morning and blue the afternoon. When sea conditions were "good" enough, 1 Secchi disk, 5 SPMR profiles, 1 CTD cast with water sampling and 3 C-OPS profiles were performed. Buoy data were also retrieved through CISCO connection.

## Cruise Report

### Monday 10 May 2010 (UTC)

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

0600 Departure from the Nice port.  
0915 Arrival at the BOUSSOLE site.  
0930 Diving on the buoy for cleaning instruments and for changing the 4 m OCP - Dacnet cable. Dark HS4 and transmissometers measurements at 10:15, 10:30 and 10:45.  
0950 Secchi disk 01 (12 m).  
1015 CISCO connection with buoy and data retrieval.  
1100 Cleaning of CISCO and ARGOS connections on the top of the buoy.  
1115 Attempt of CISCO connection with the buoy: unsuccessful.  
1130 CTD 01, 400 m with water sampling at 200, 150, 80, 70, 60, 50, 40, 30, 20 and 10 m for HPLC and Ap.  
1215 CISCO connection with buoy and data retrieval.  
1220 Niskin bottle on rosette for water sampling at 5 m for HPLC, Ap and TSM.  
1225 Departure to the first transect station.  
1255 CTD 02, 400 m, station 01 (43°25'N 07°48'E).  
1355 CTD 03, 400 m, station 02 (43°28'N 07°42'E).  
1455 CTD 04, 400 m, station 03 (43°31'N 07°37'E).  
1555 CTD 05, 400 m, station 04 (43°34'N 07°31'E).  
1655 CTD 06, 400 m, station 05 (43°37'N 07°25'E).  
1745 CTD 07, 400 m, station 06 (43°39'N 07°21'E).  
1820 Departure to the Nice port.  
1900 Arrival at the Nice port.

### Tuesday 11 May 2010 (UTC)

People on board: Alain Cariou, Emilie Diamond, Raymond Le Guen, Stéphane Marchand, Grigor Obolensky and Vincent Taillandier.

0510 Departure from the Nice port.  
0805 Arrival at the Météo-France buoy near the DYFAMED site.  
0810 Météo-France weather buoy maintenance.  
0815 2 x Plankton net, 0-100 m.  
0840 PVM, 1000 m.  
0955 Departure to the BOUSSOLE site.  
1010 Arrival at the BOUSSOLE site.  
1015 CTD MOOSE, 2500 m with water sampling at 200, 100, 80, 60, 40, 20 and 10 m for HPLC and Ap.  
1150 C-OPS 01, 02, 03.

1310 SPMR 01, 02, 03.  
1415 Departure to the Nice port.  
1715 Arrival at the Nice port.

## Wednesday 12 May 2010 (UTC)

Restrictions from the port authorities prevented departure from the Nice port. Zonex 26 and 28 not allowed.

## Thursday 13 May 2010

Changing of the Téthys II crew.

## Friday 14 May 2010 (UTC)

People on board: Emilie Diamond and Grigor Obolensky.

0525 Departure from the Nice port.  
0850 Arrival at the BOUSSOLE site.  
0855 Secchi disk 02 (14 m).  
0900 Lunch: sea conditions too rough to work.  
0915 Attempt of CISCO connection with the buoy: unsuccessful because too far away from the buoy.  
1015 Attempt of CISCO connection with the buoy: unsuccessful.  
1020 SPMR 04, 05.  
1100 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.  
1145 SPMR 06, 07, 08.  
1225 C-OPS 04, 05, 06 and SMSR reference in parallel.  
1315 CISCO connection with buoy and data retrieval.  
1325 Departure to the Nice port.  
1640 Arrival at the Nice port.

## Problems identified during the cruise

- Zonex 26 and 28 not allowed on Wednesday.
- Sea conditions were not optimal the last day and prevented the cleaning of buoy ARGOS connection which did not work since the day before.
- The O<sub>2</sub> and CDOM sensors on the CTD did not work well during this mission.

Calculated Swath paths for the MERIS Sensor (ESOV Software)

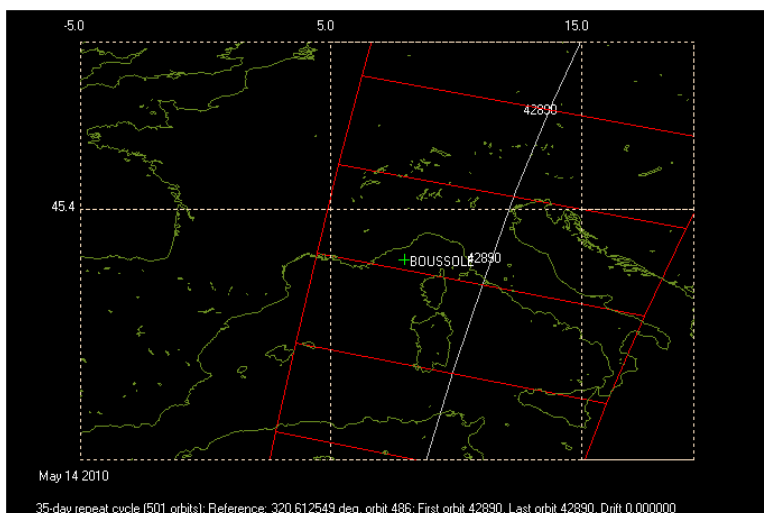
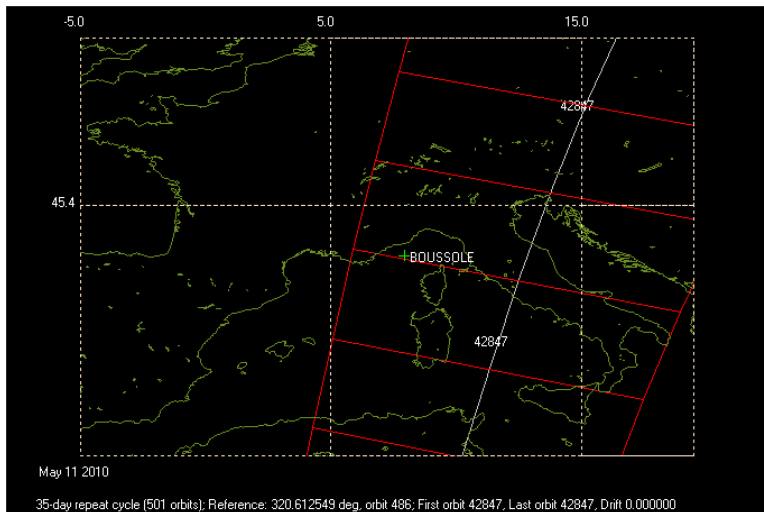
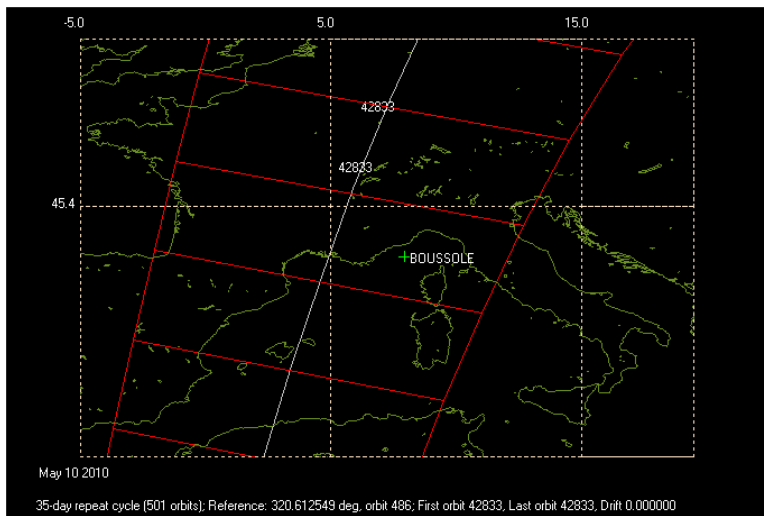


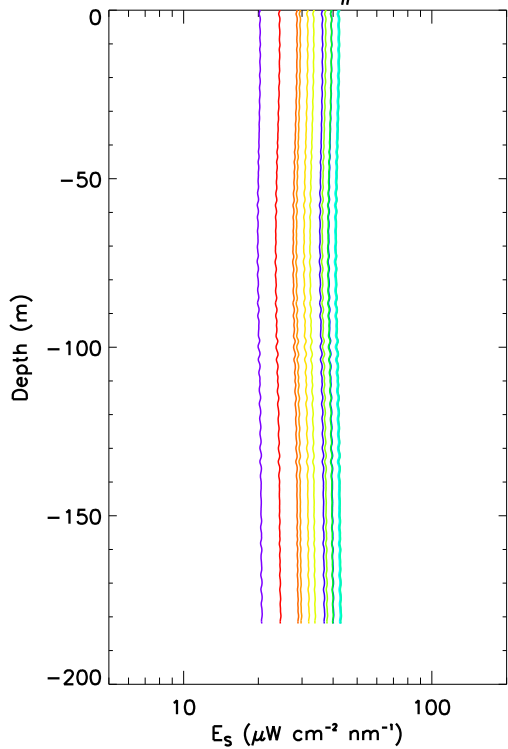
Figure 2. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for 10, 11 and 14 May 2010.

# **Appendix**

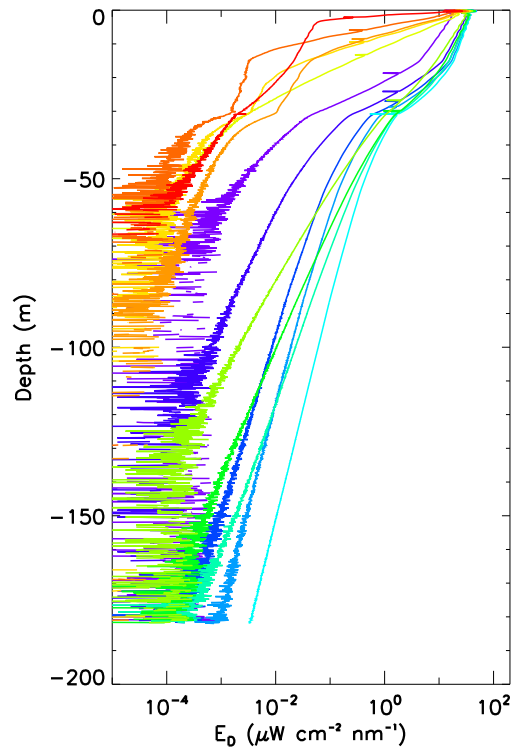




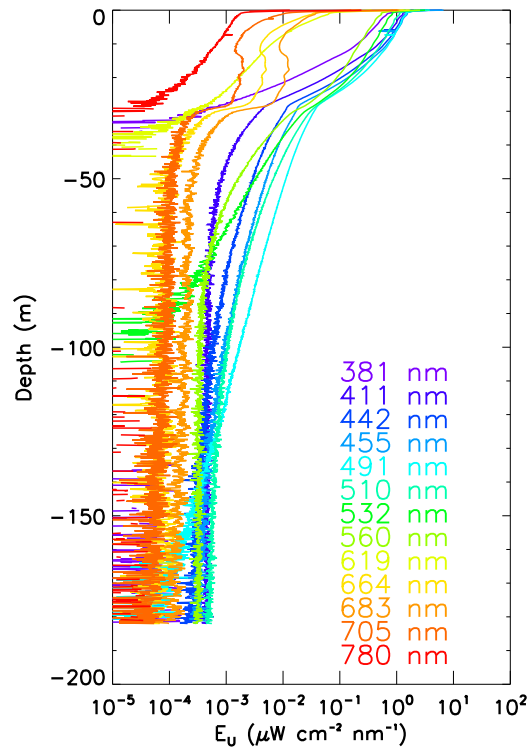
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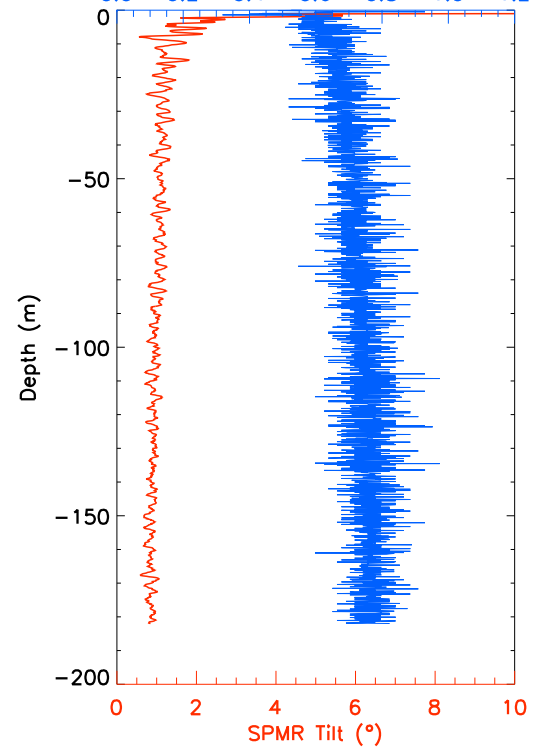
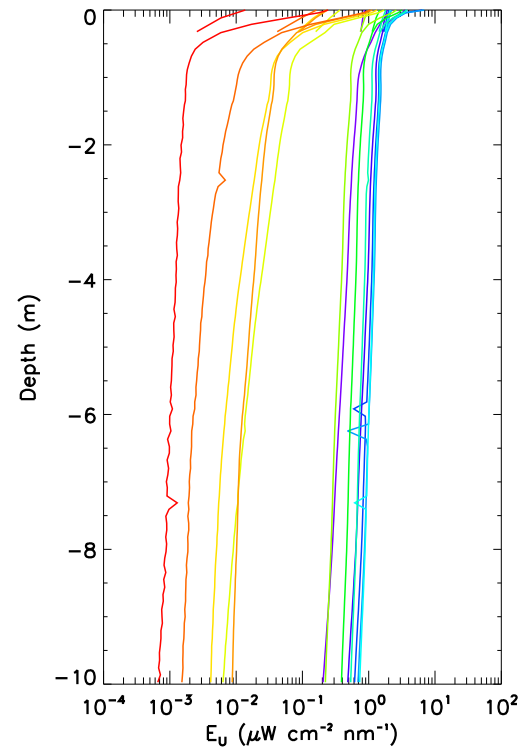
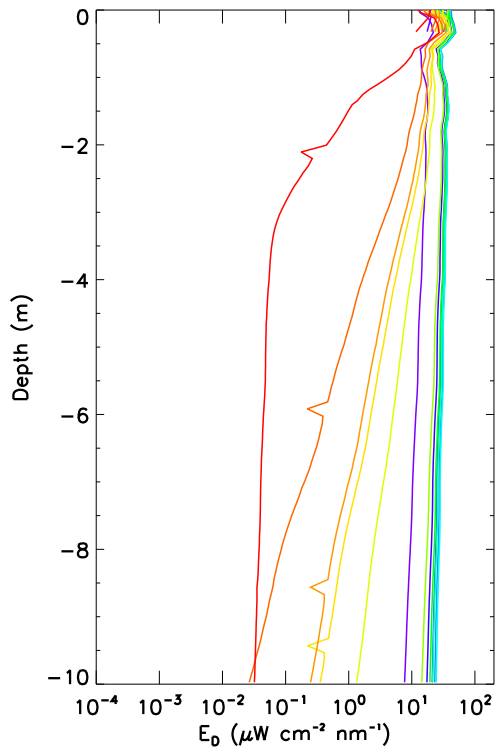
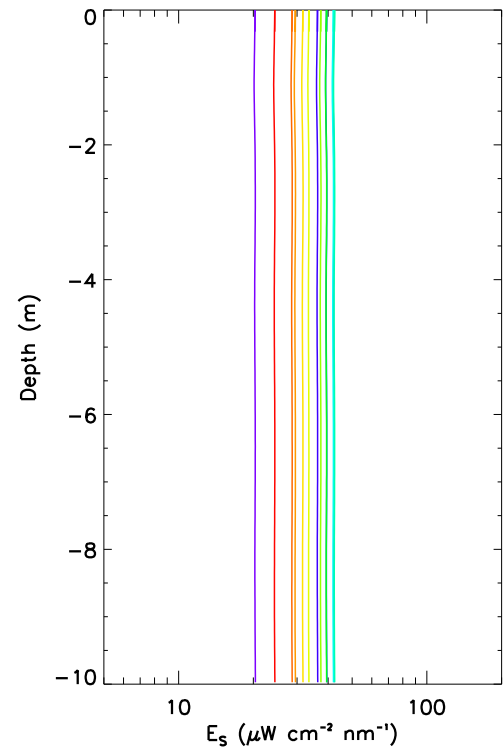
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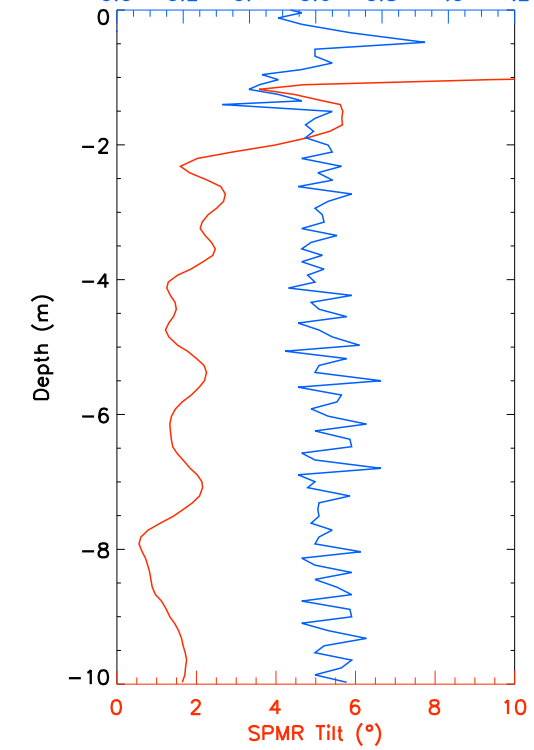
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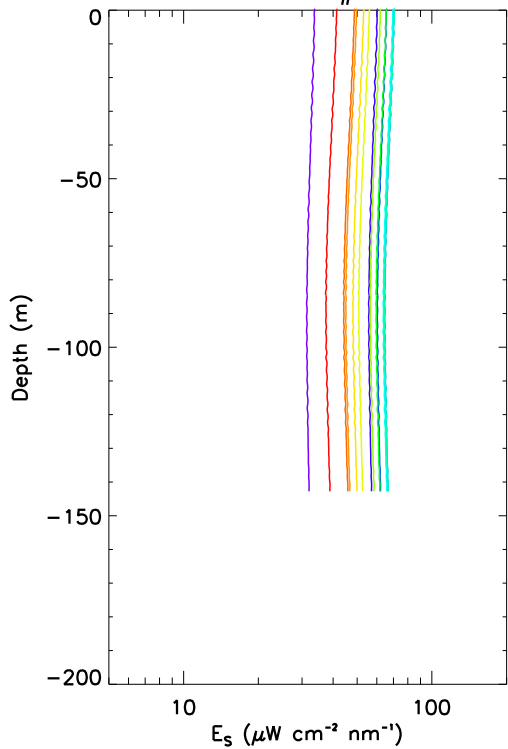
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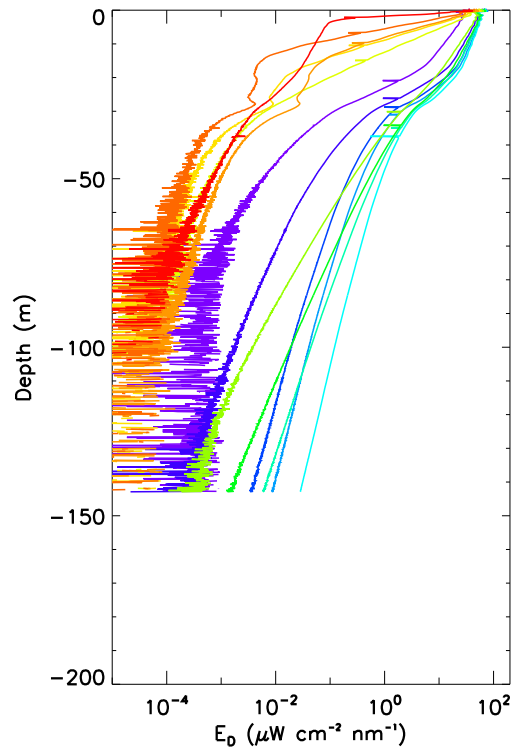
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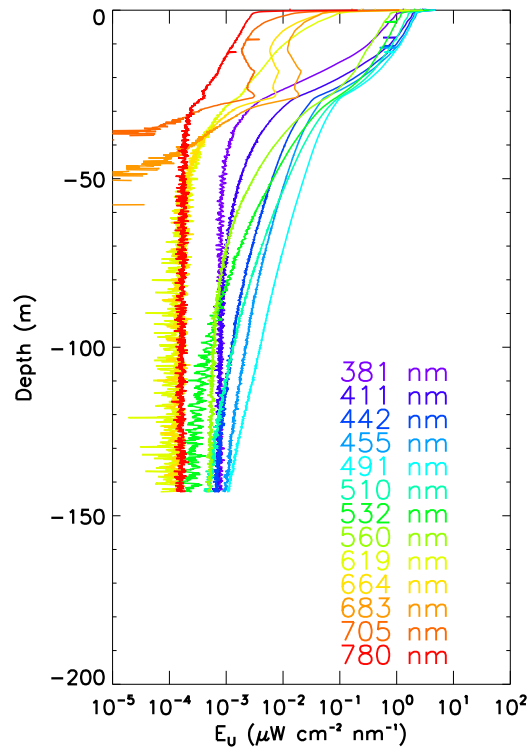
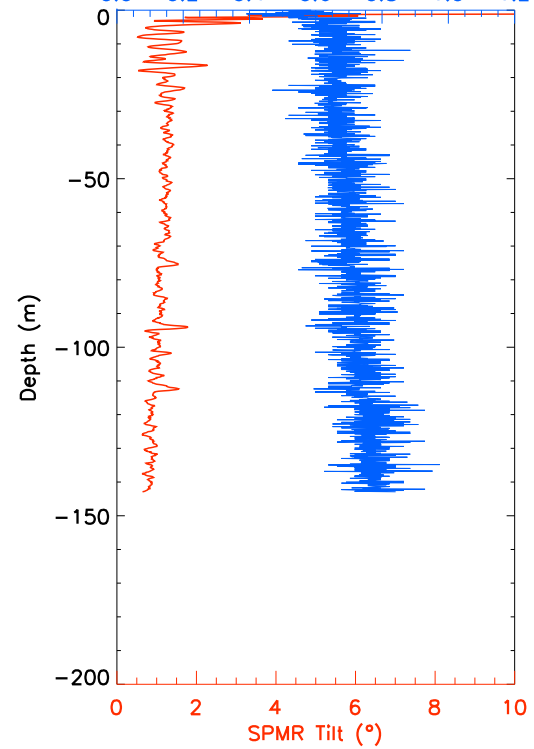
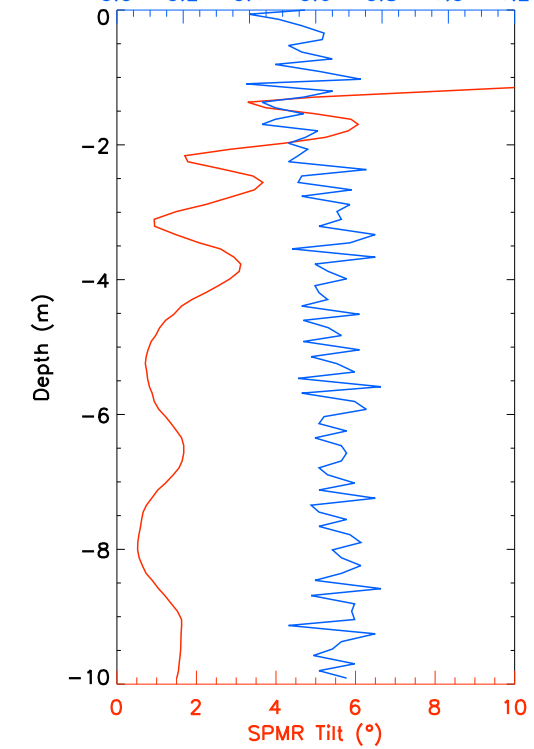
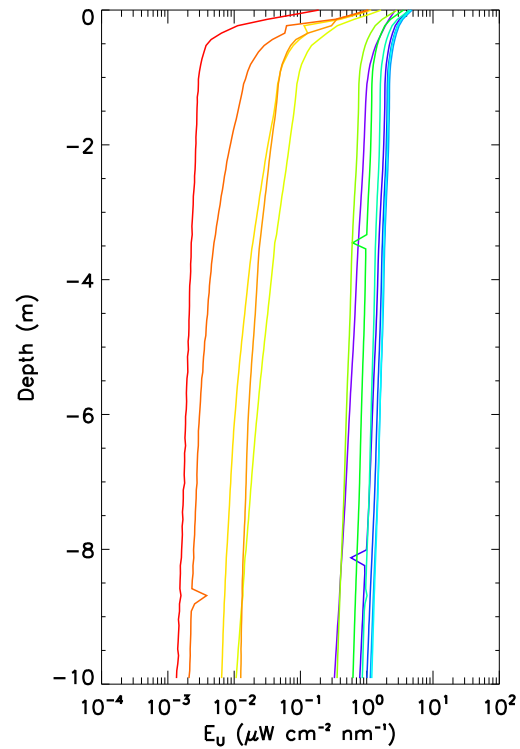
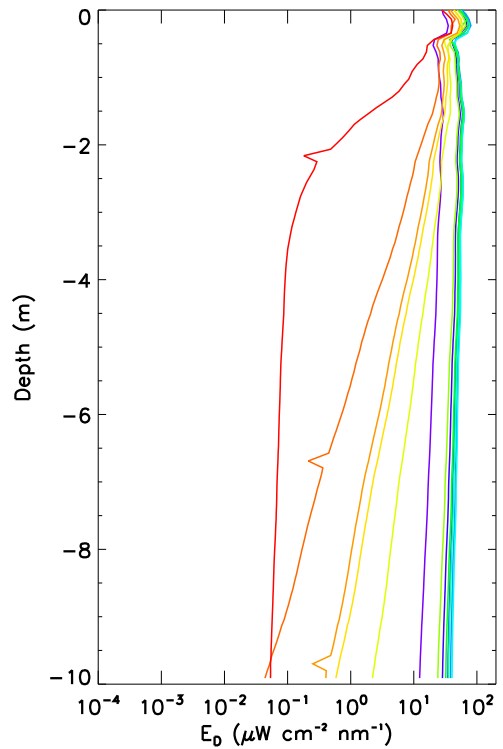
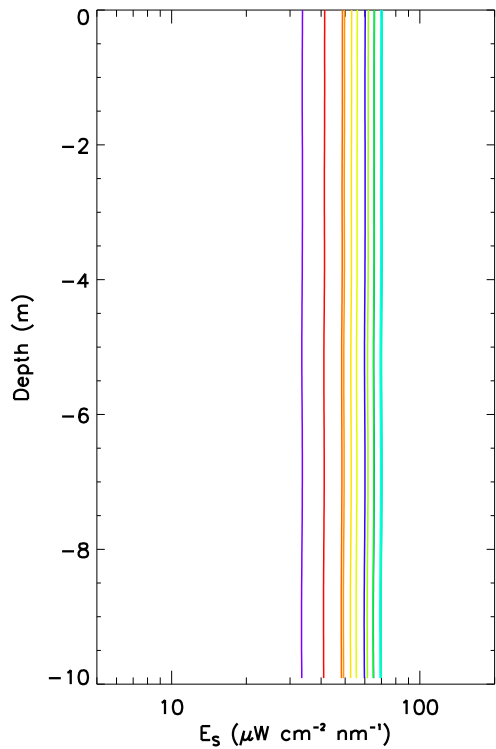
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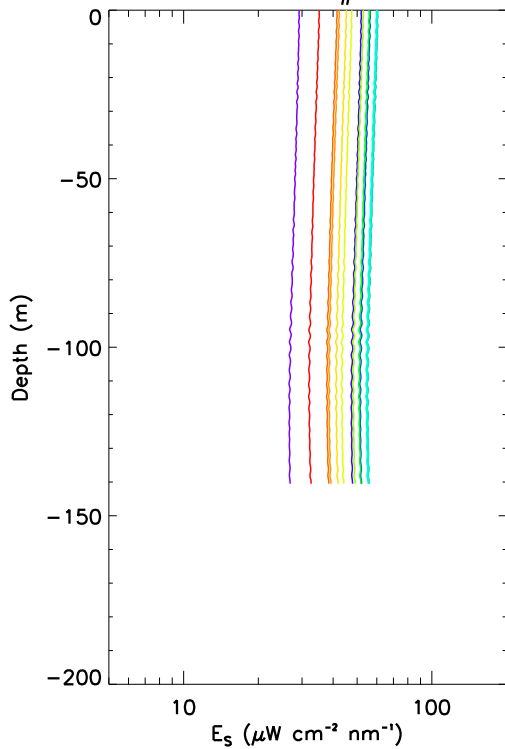
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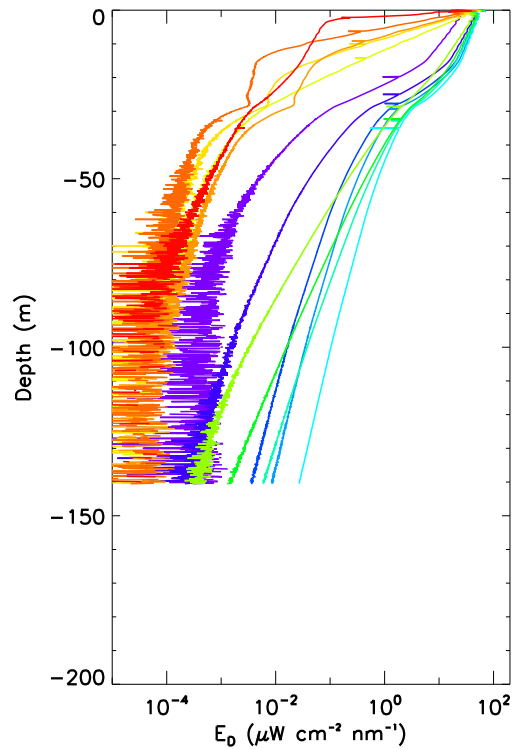
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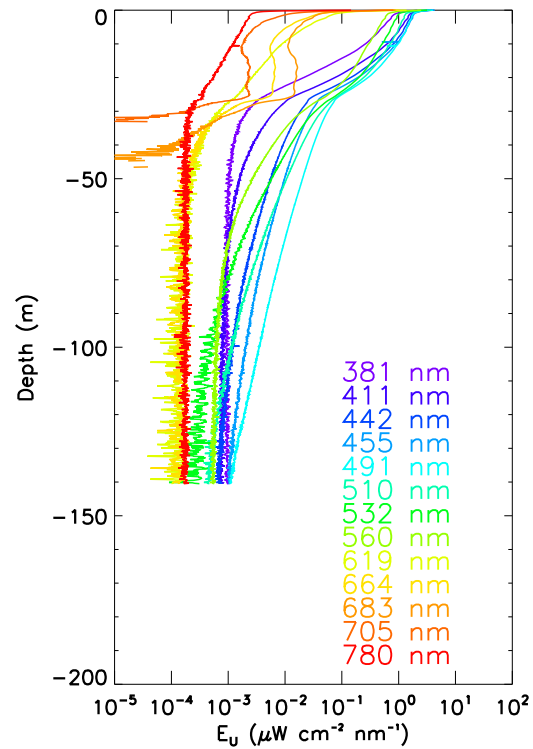
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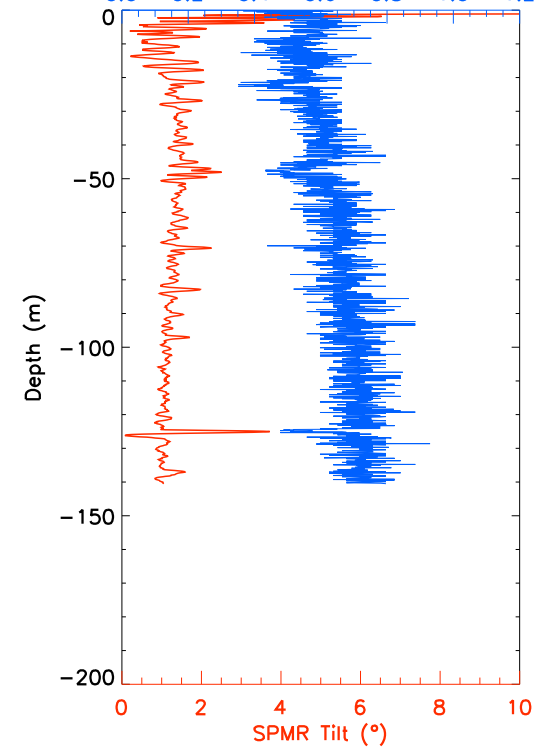
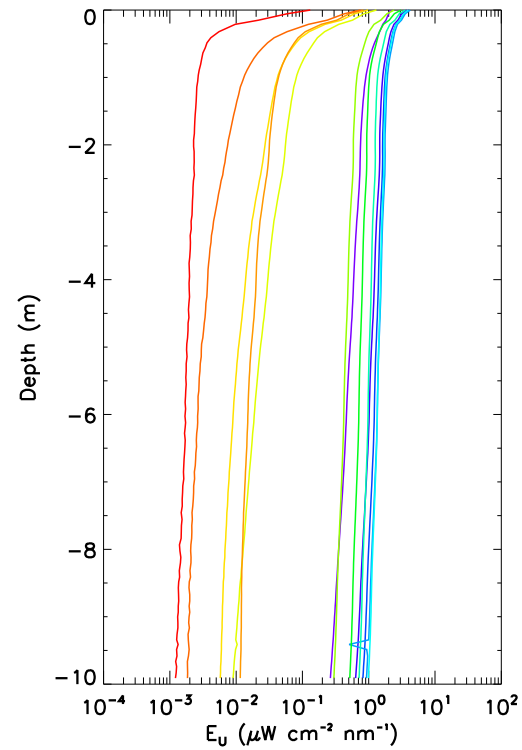
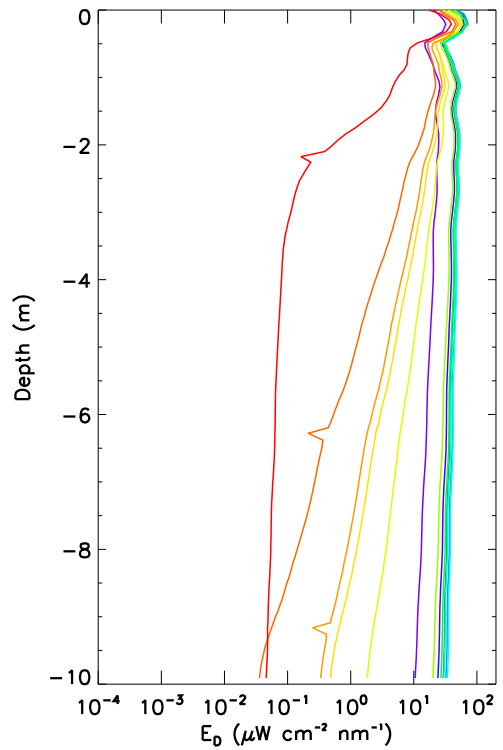
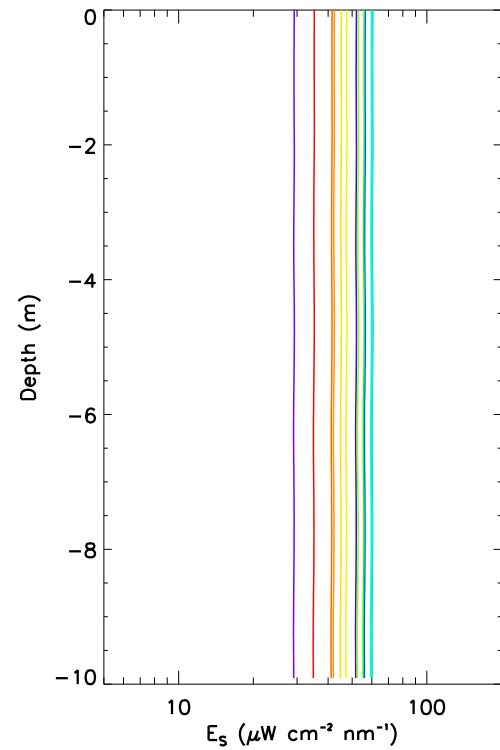
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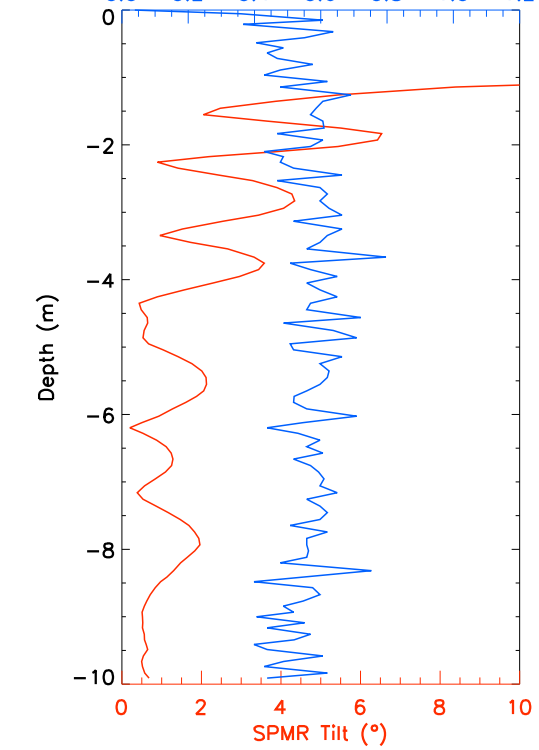
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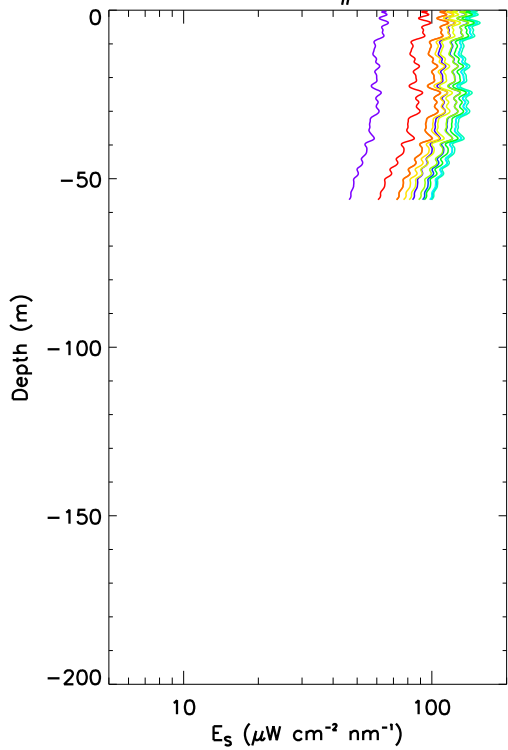
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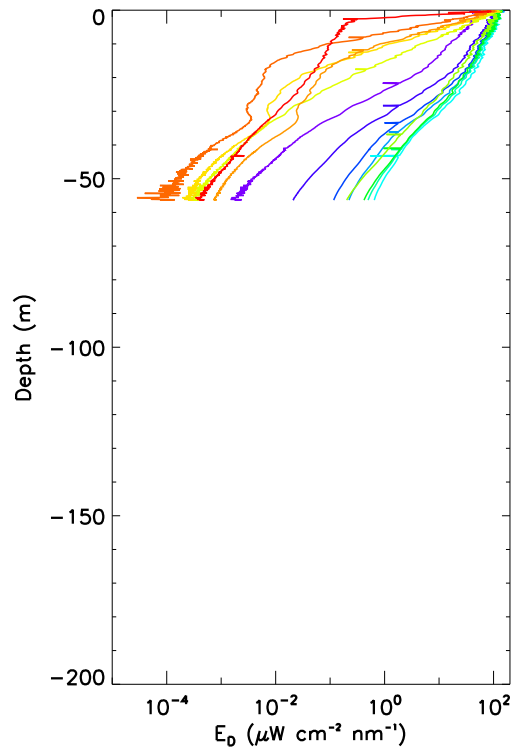
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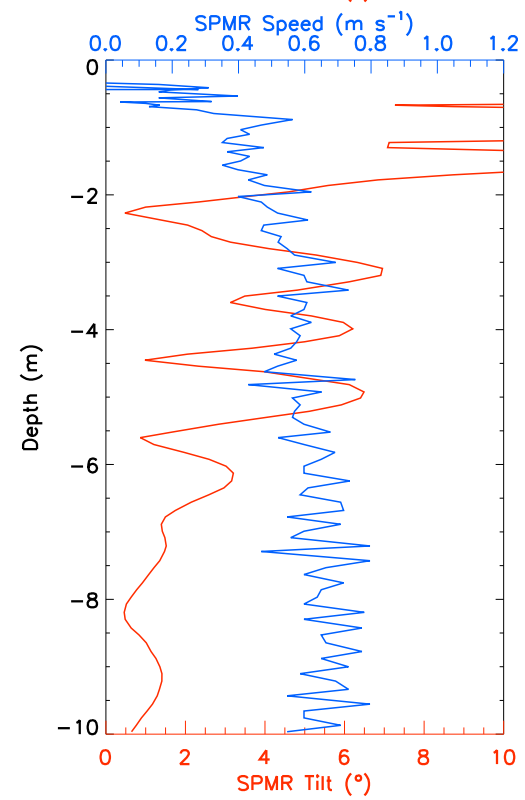
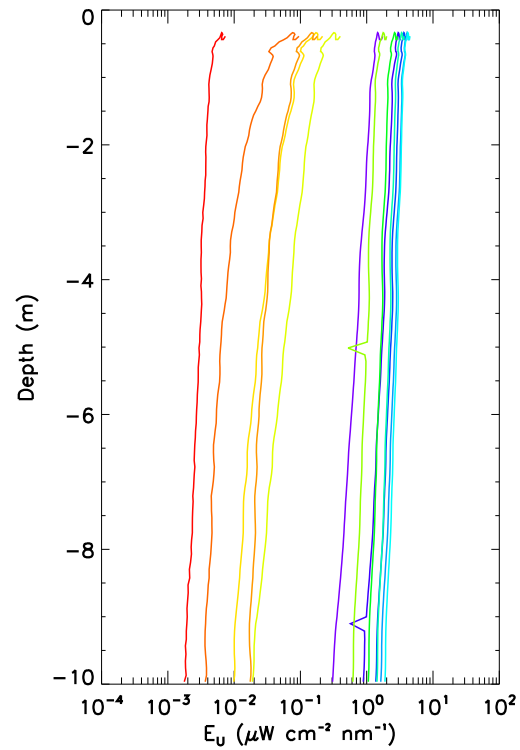
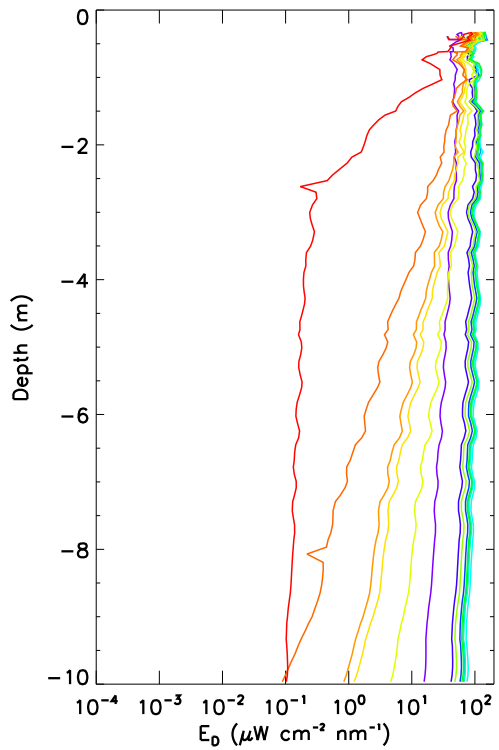
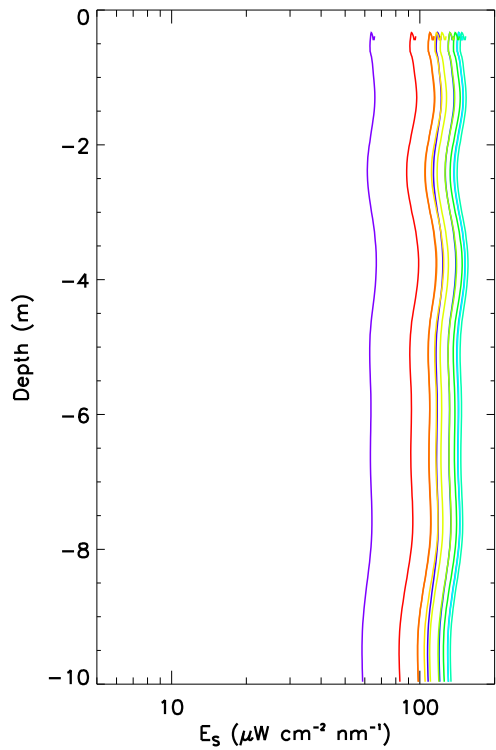
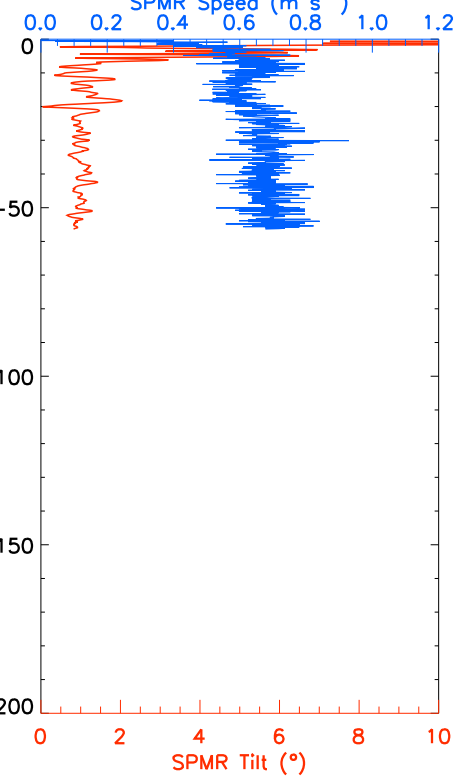
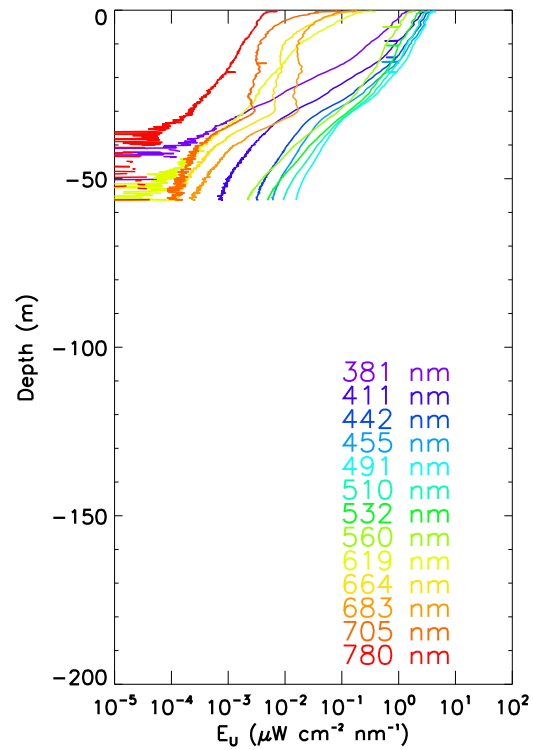
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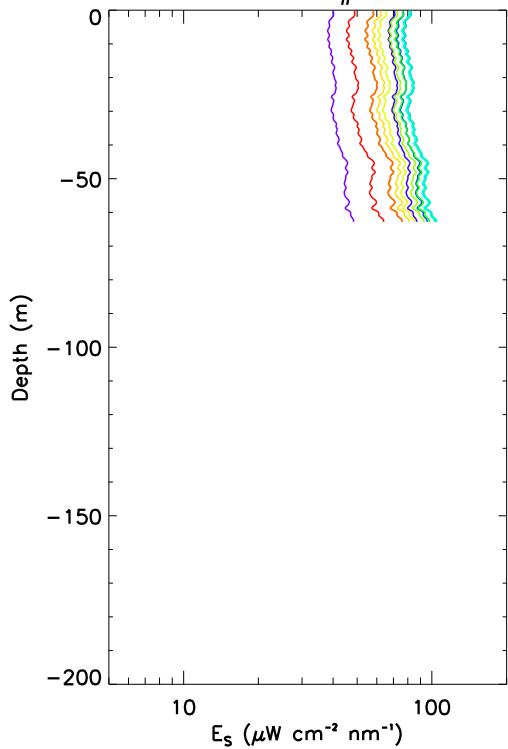
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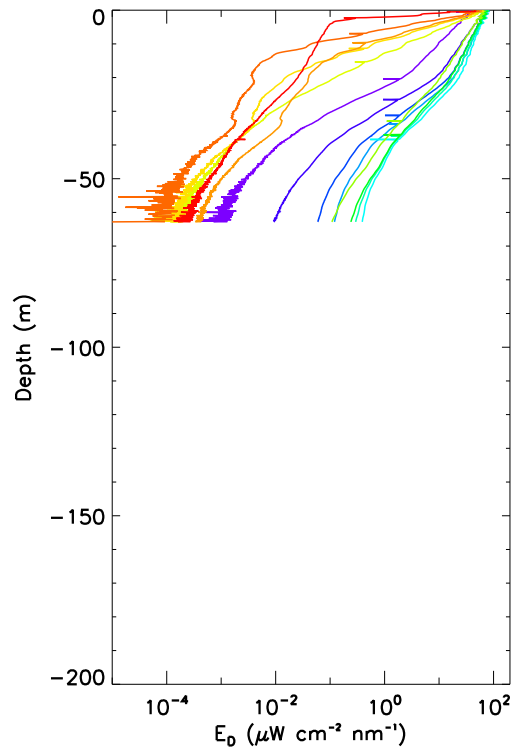
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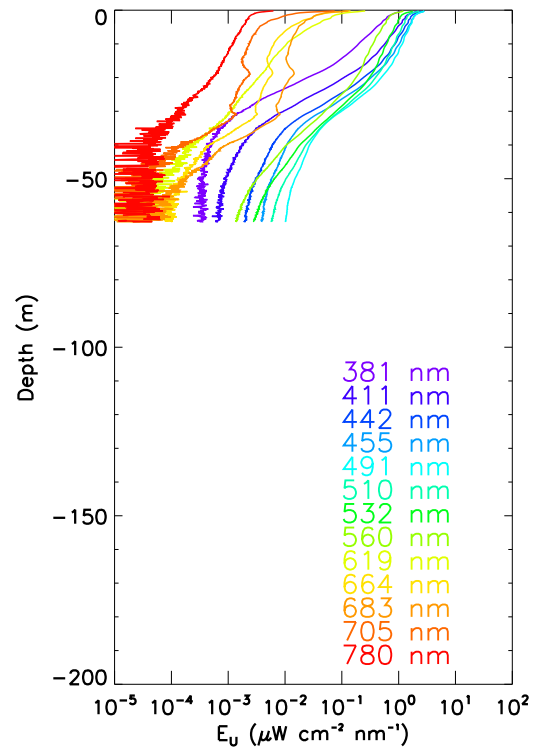
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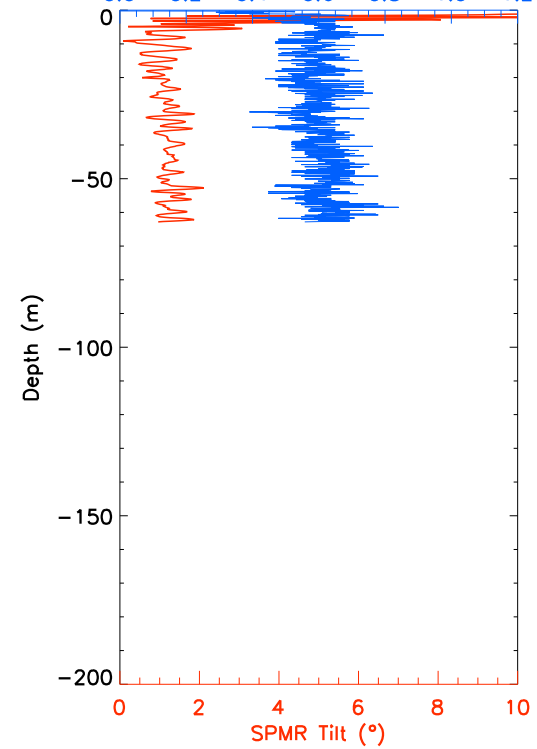
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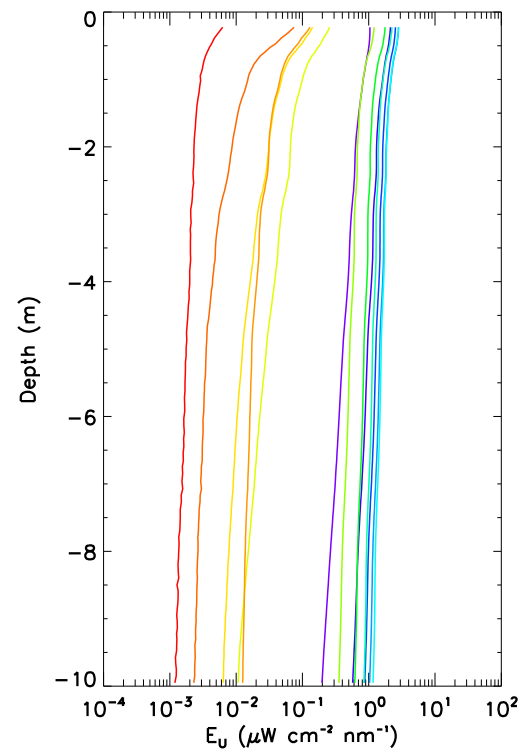
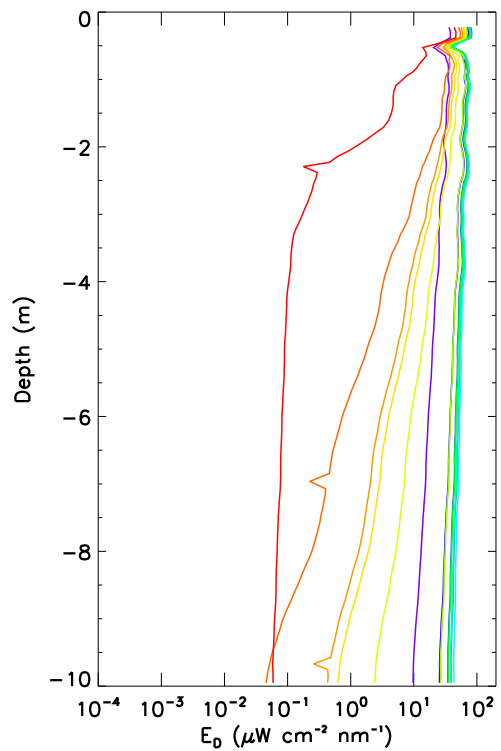
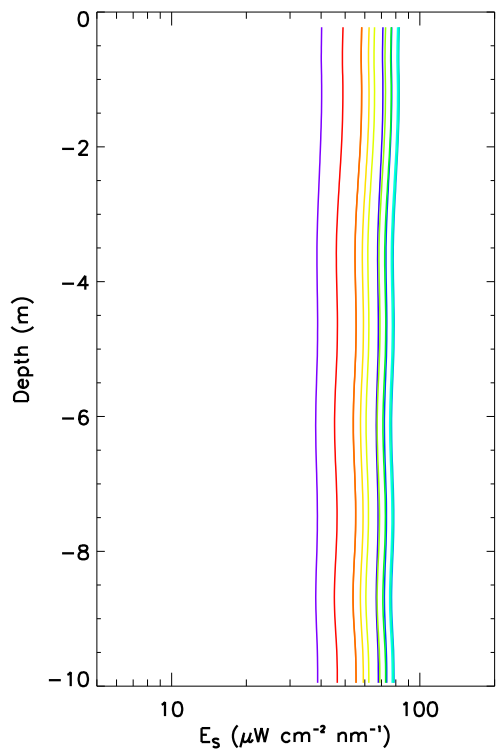
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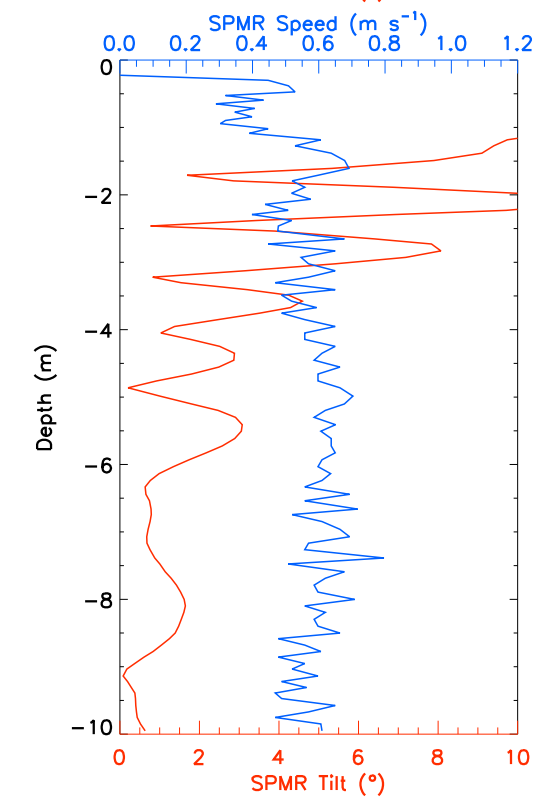
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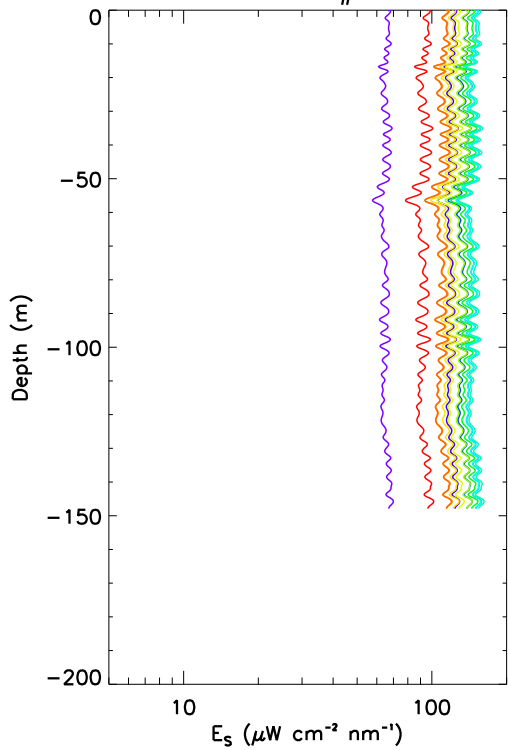
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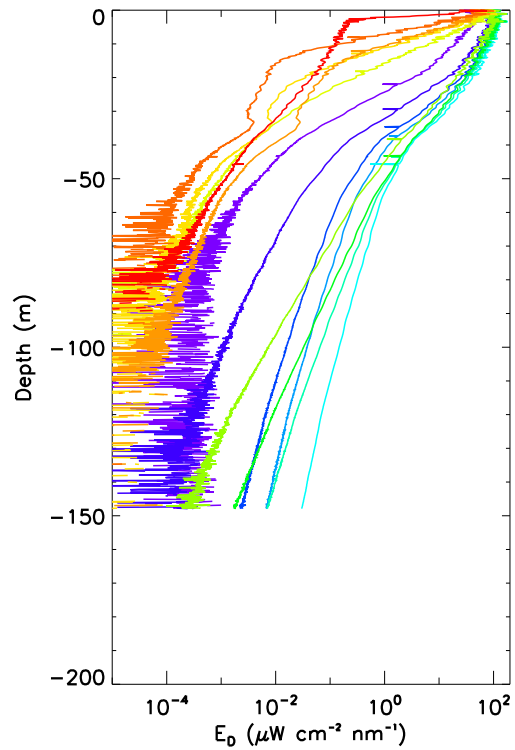
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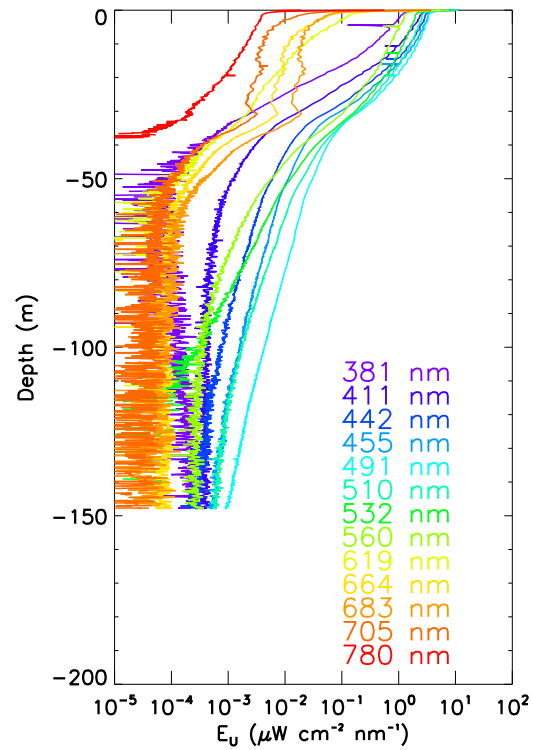
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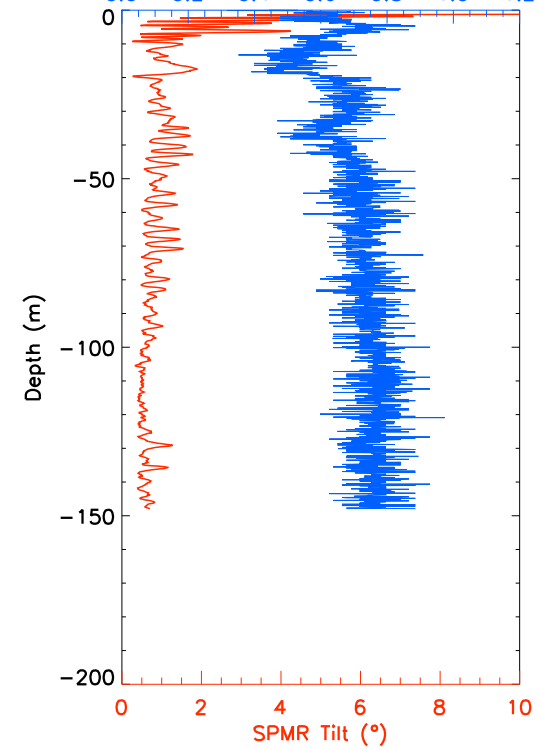
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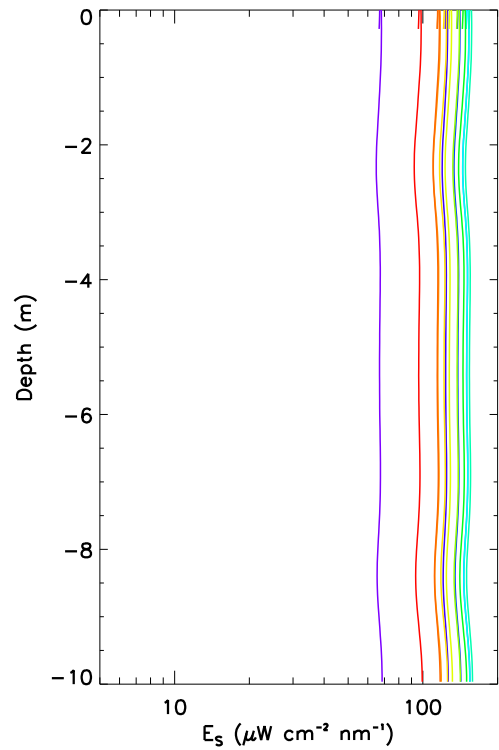
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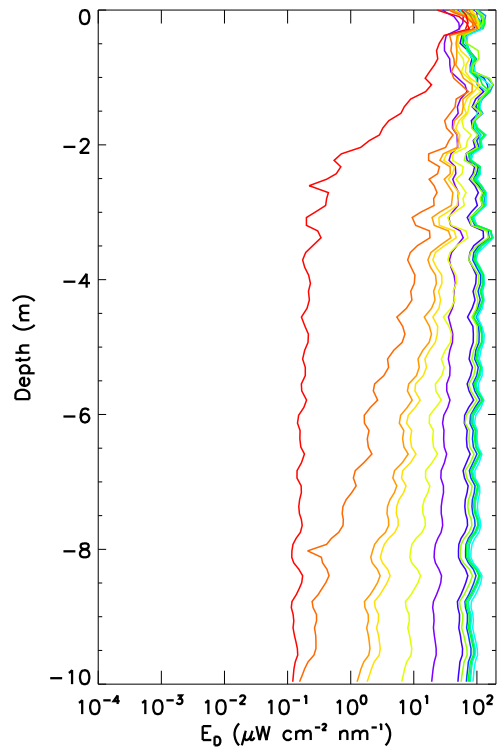
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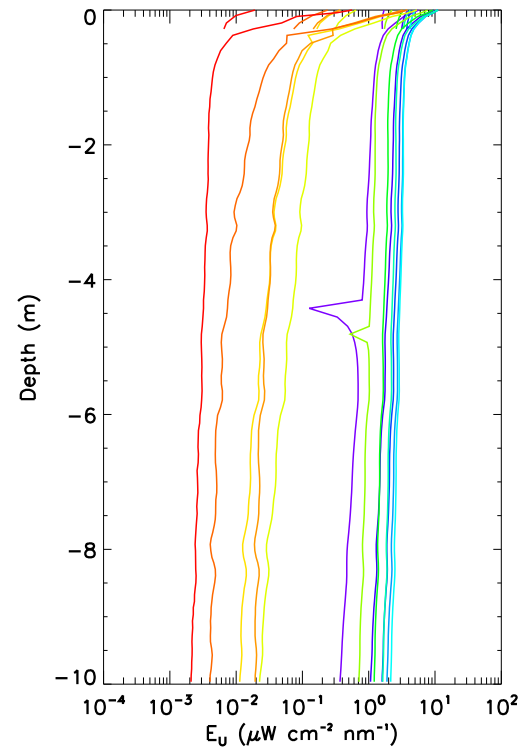
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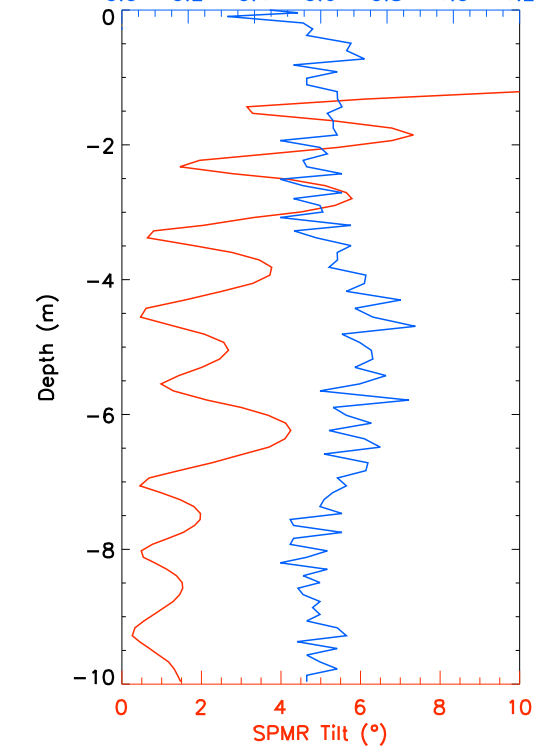
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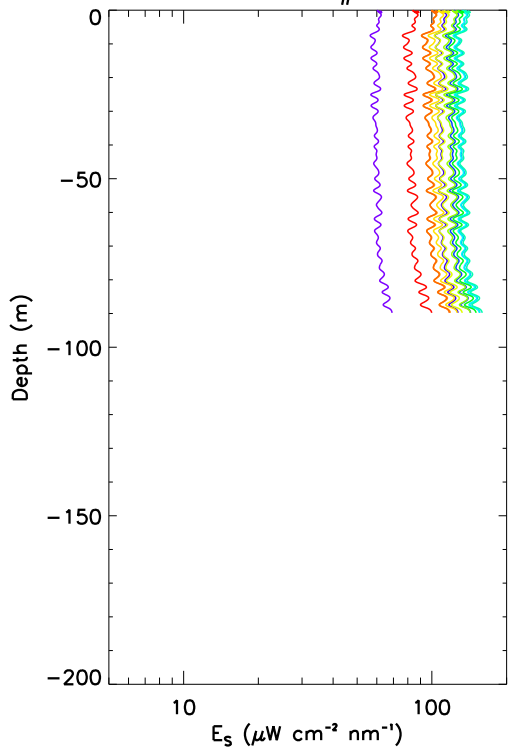
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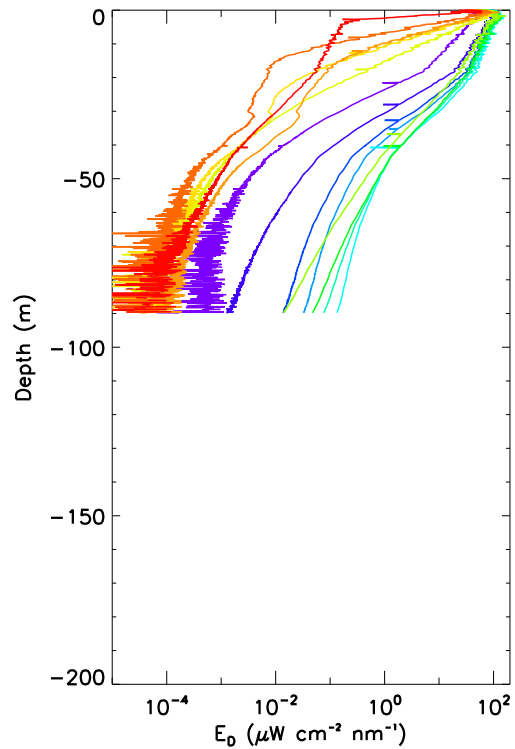
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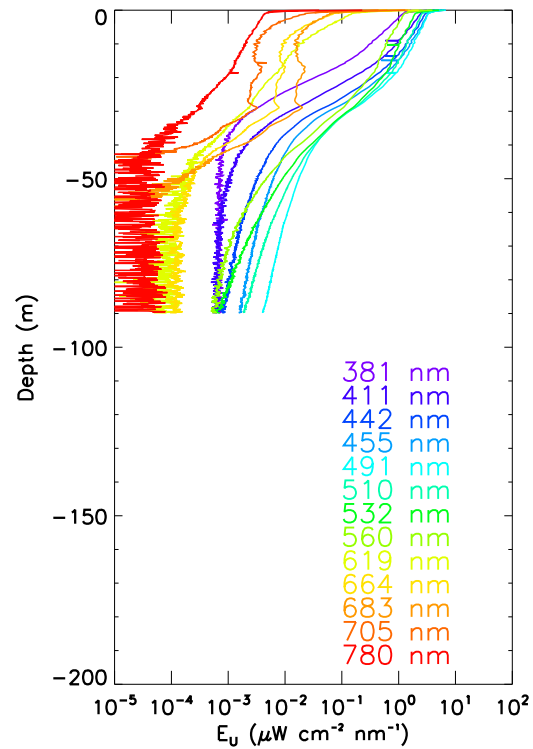
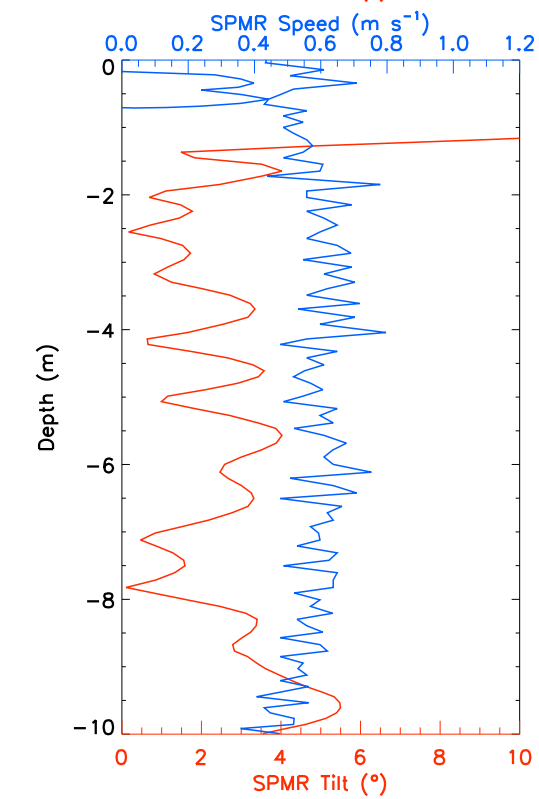
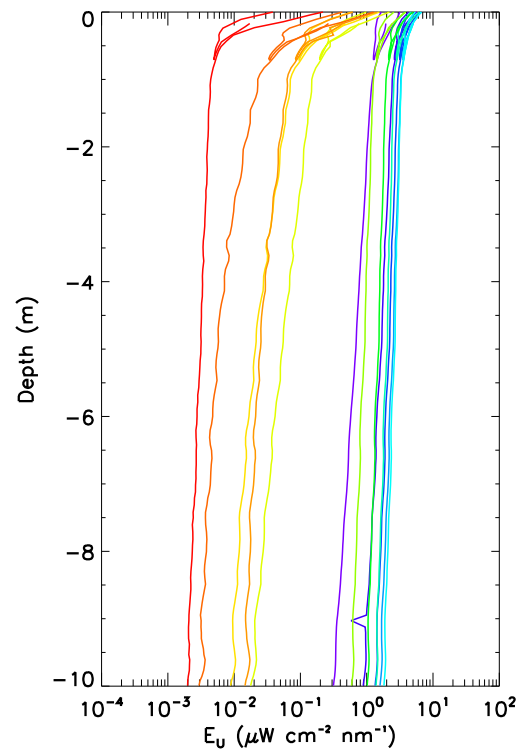
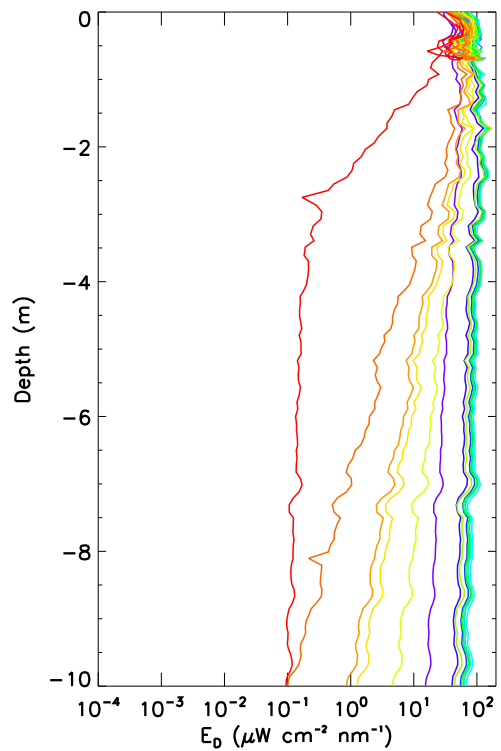
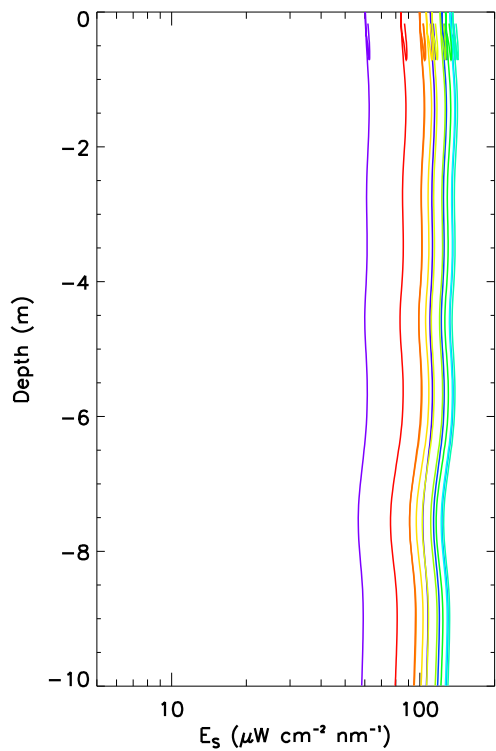
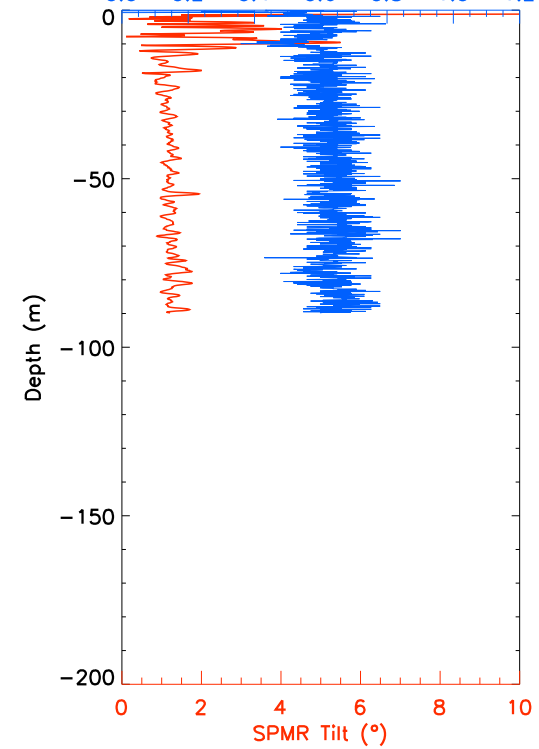
Boussole#98



B98\_Bou140510AG

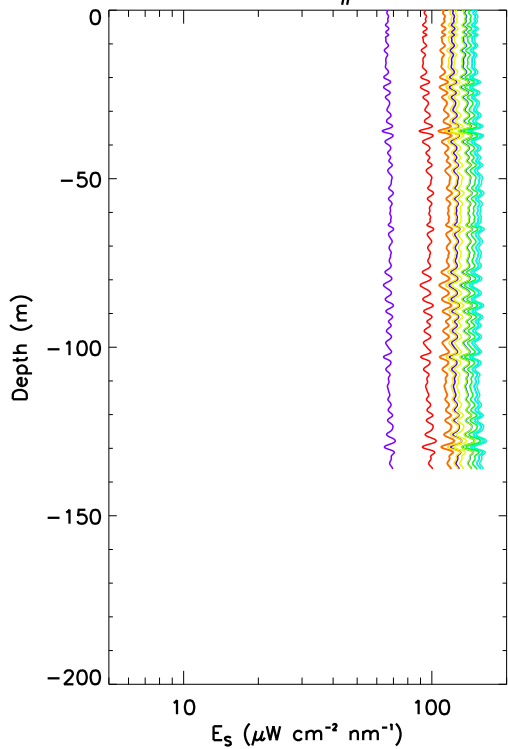


12:3 UTC

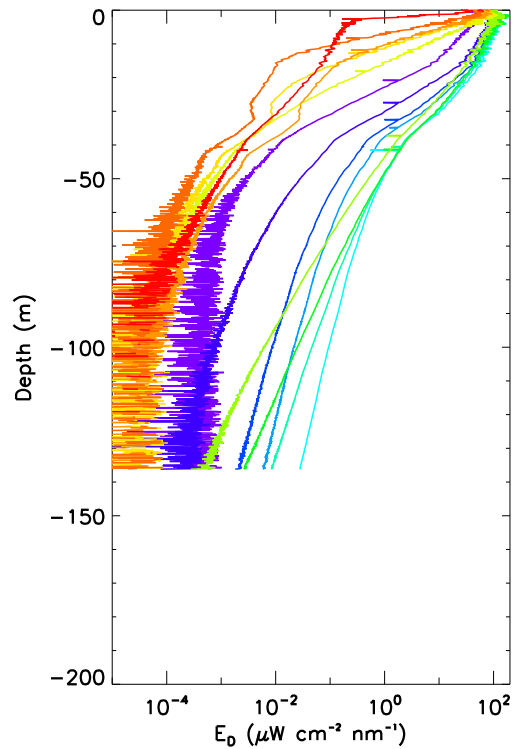
SPMR Speed ( $\text{m s}^{-1}$ )



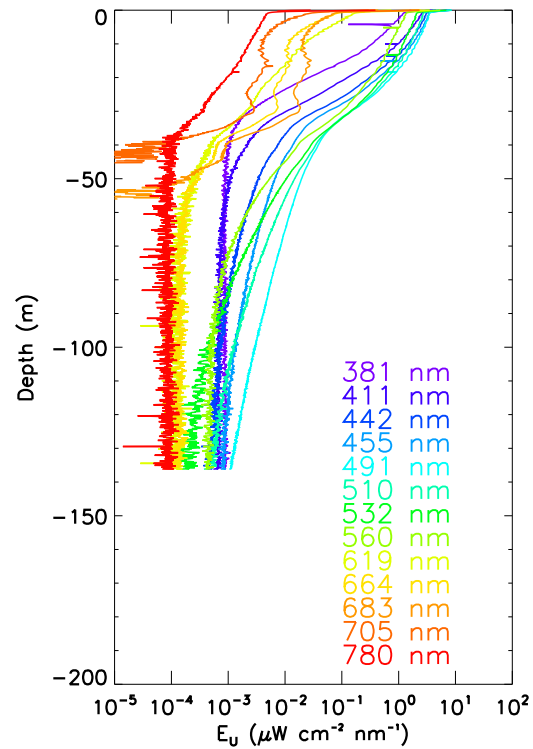
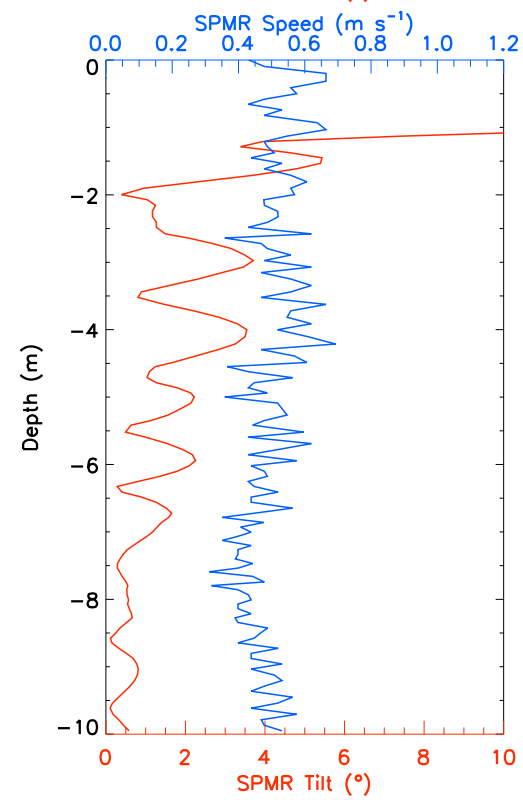
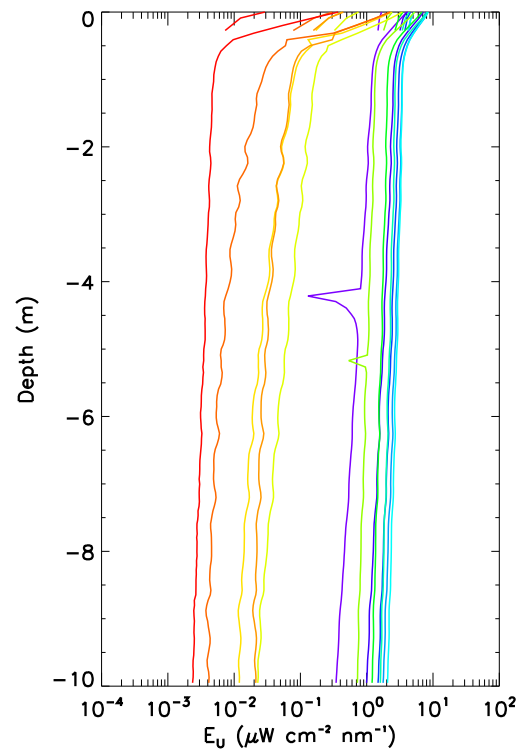
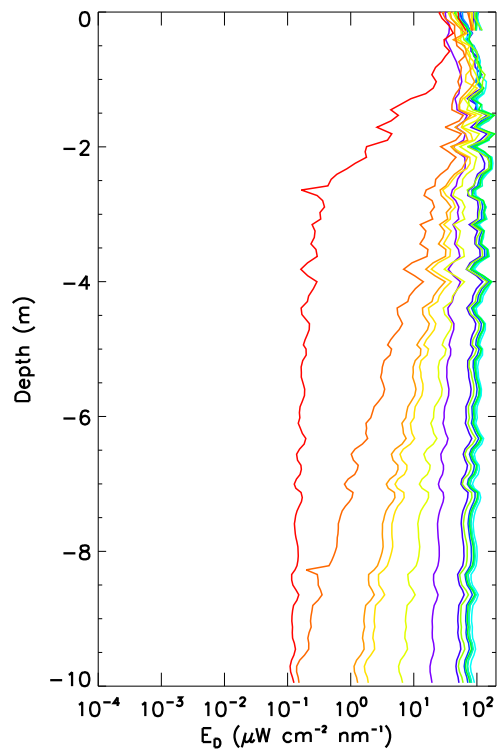
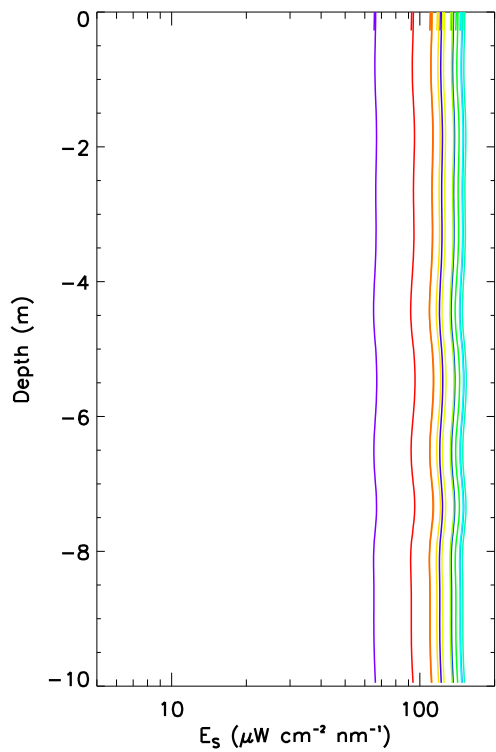
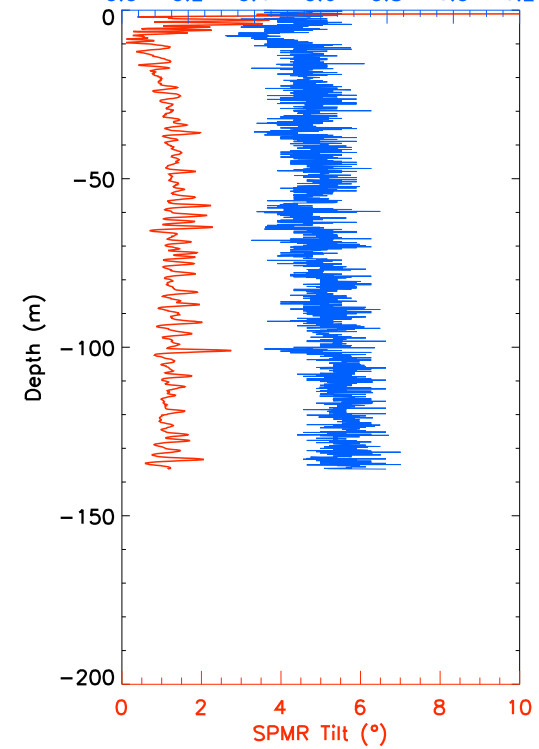
Boussole#98



B98\_Bou140510AH



12:9 UTC

SPMR Speed ( $\text{m s}^{-1}$ )

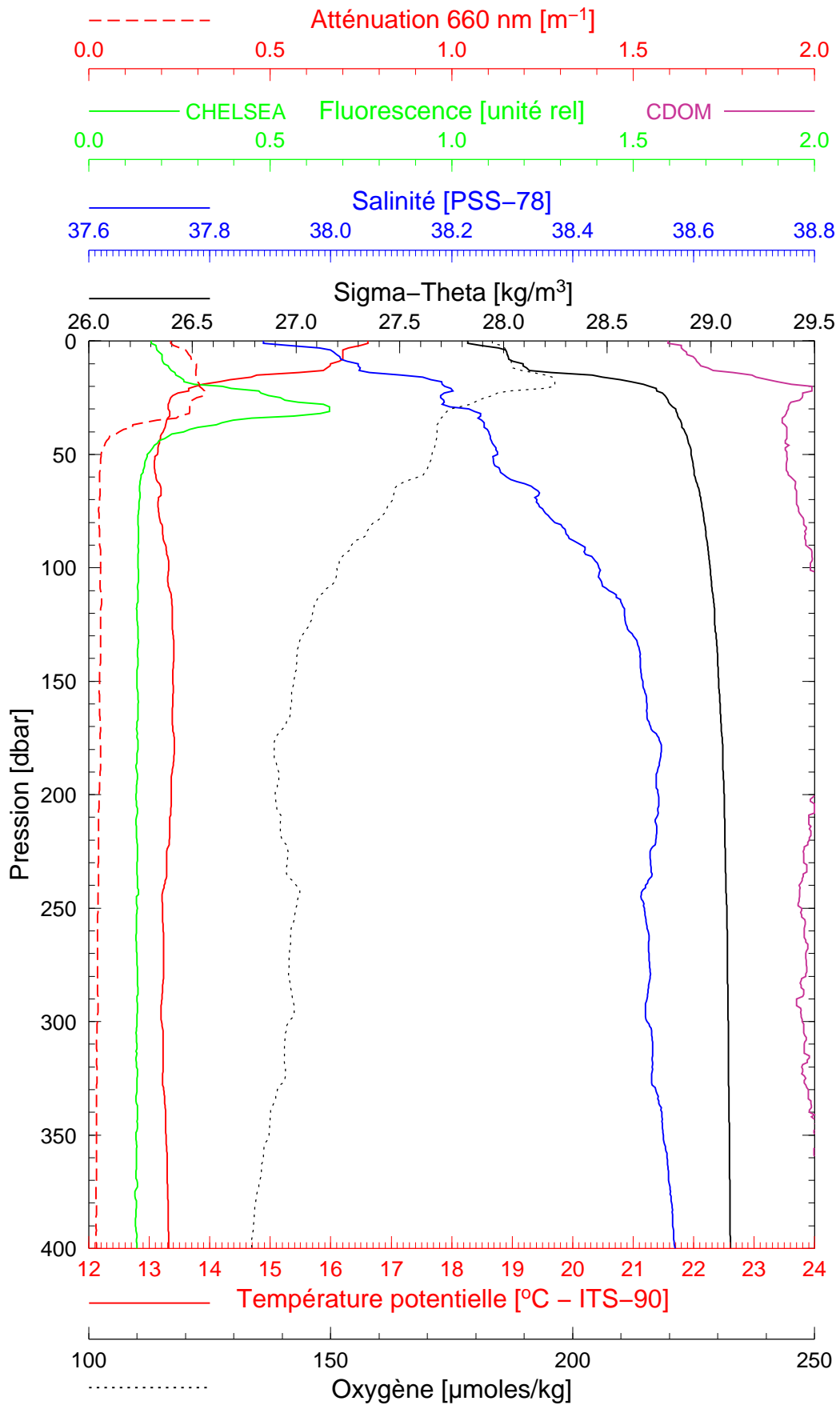


BOUSSOLE 98

10/05/2010

BOUS100510\_01

BOUS001



Date 10/05/2010

Latitude 43°22.050

Heure déb 11h 29min [TU]

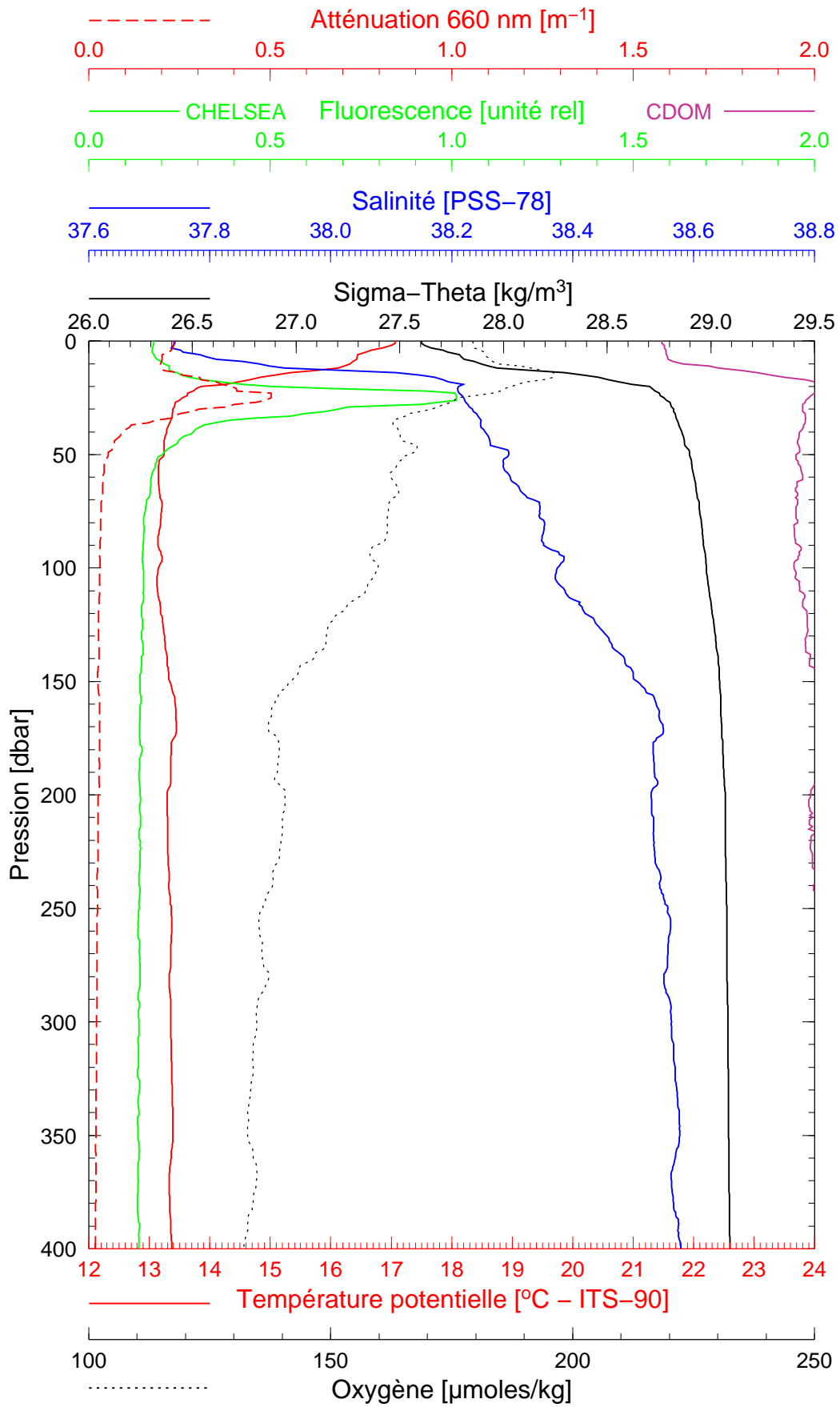
Longitude 07°53.978

BOUSSOLE 98

10/05/2010

BOUS100510\_02

BOUS002



Date 10/05/2010

Latitude 43°24.990

Heure déb 13h 00min [TU]

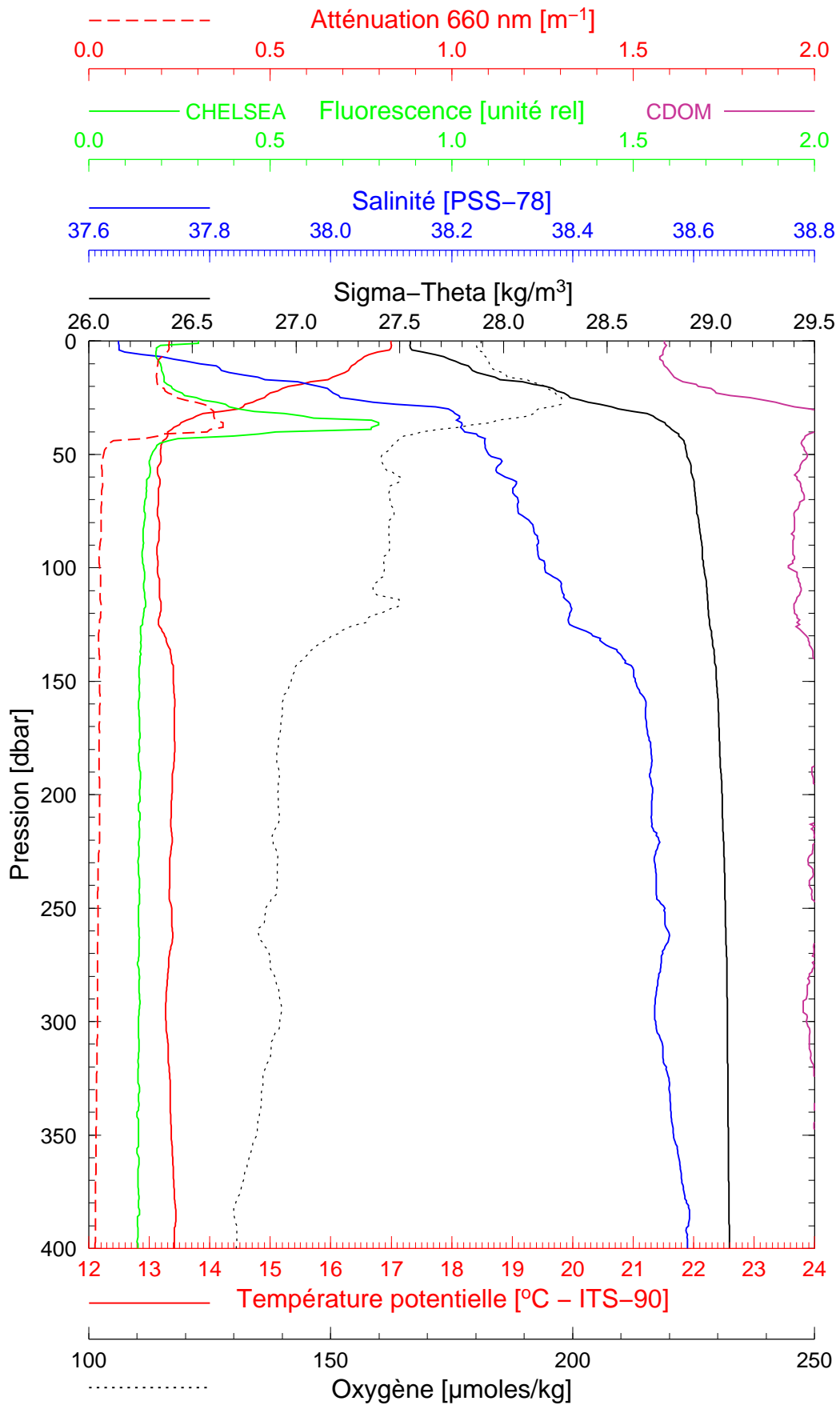
Longitude 07°47.885

BOUSSOLE 98

10/05/2010

BOUS100510\_03

BOUS003



Date 10/05/2010

Latitude 43°28.008

Heure déb 14h 01min [TU]

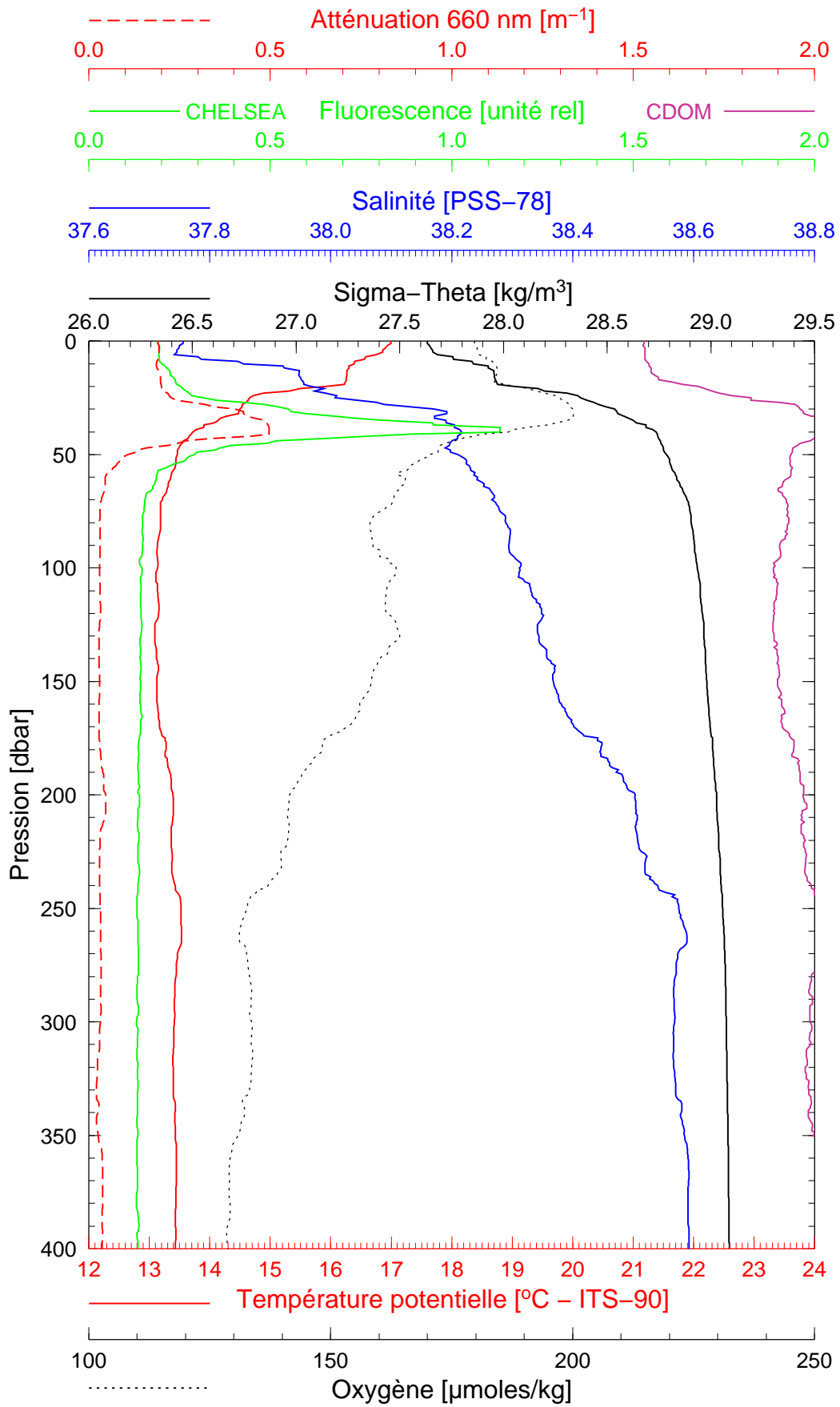
Longitude 07°42.026

BOUSSOLE 98

10/05/2010

BOUS100510\_04

BOUS004



Date 10/05/2010

Latitude 43°31.061

Heure déb 15h 00min [TU]

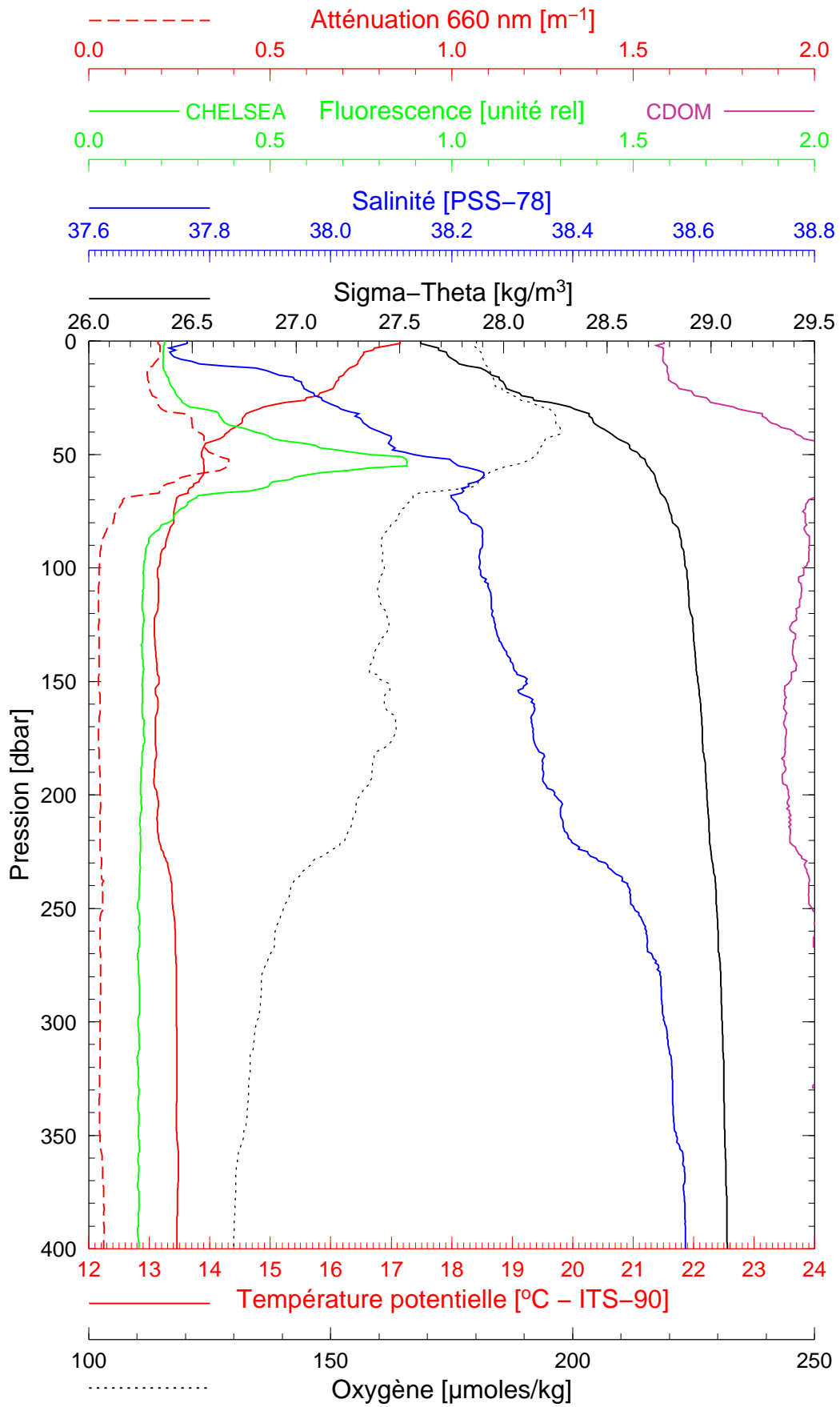
Longitude 07°36.351

BOUSSOLE 98

10/05/2010

BOUS100510\_05

BOUS005



Date 10/05/2010

Latitude 43°34.029

Heure déb 16h 04min [TU]

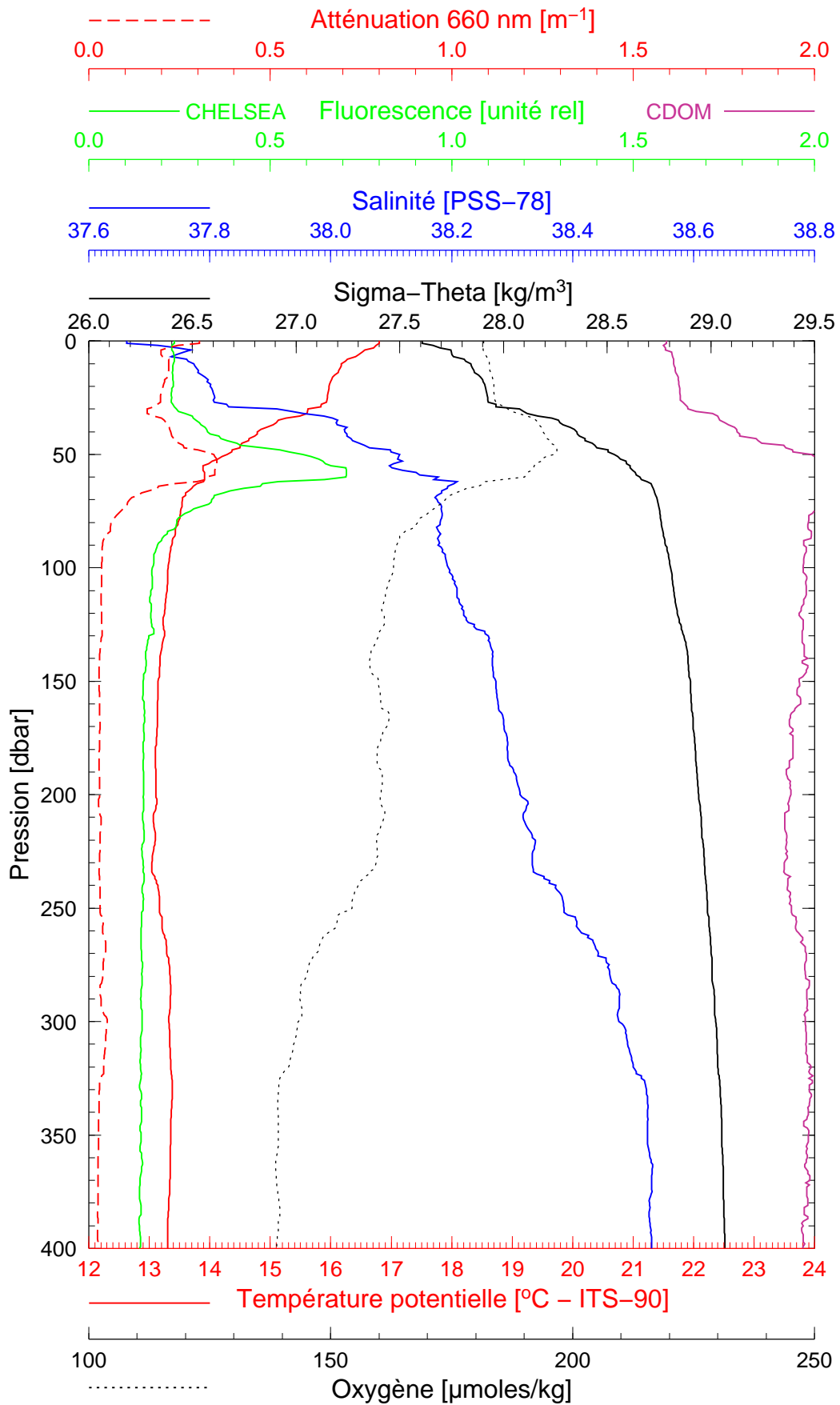
Longitude 07°30.892

BOUSSOLE 98

10/05/2010

BOUS100510\_06

BOUS006



Date 10/05/2010

Latitude 43°36.974

Heure déb 17h 01min [TU]

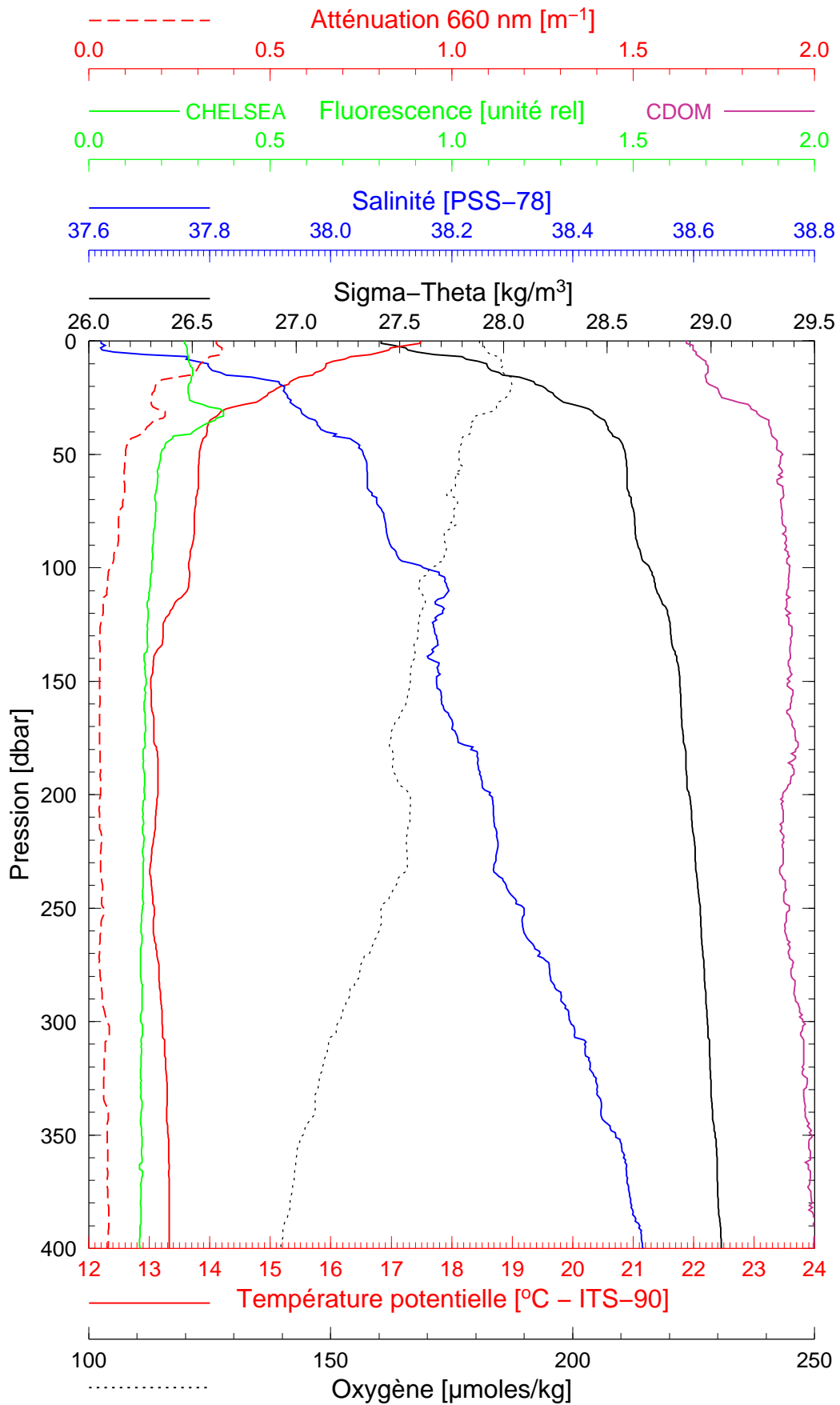
Longitude 07°24.936

BOUSSOLE 98

10/05/2010

BOUS100510\_07

BOUS007



Date 10/05/2010

Latitude 43°39.007

Heure déb 17h 50min [TU]

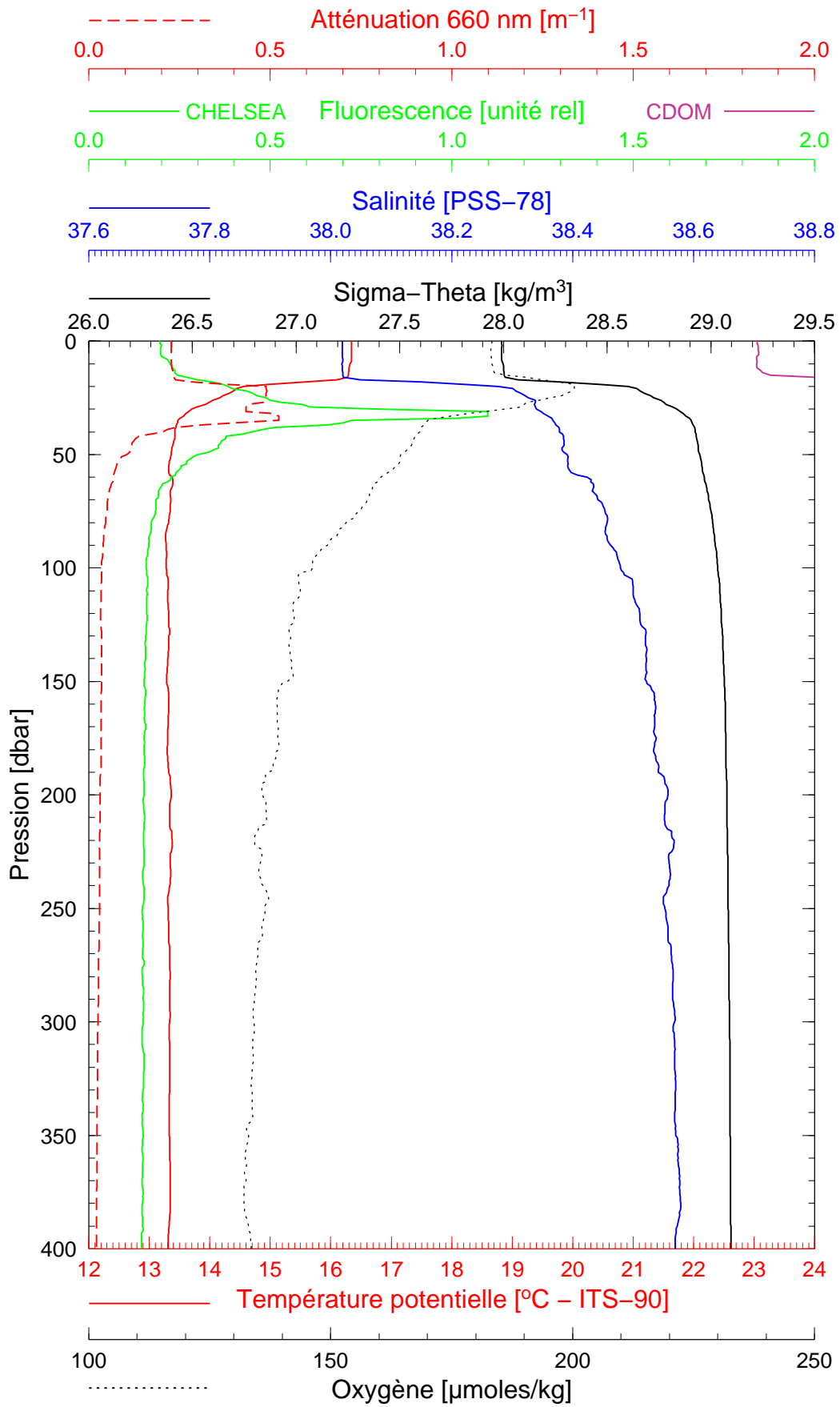
Longitude 07°20.972

BOUSSOLE 98

14/05/2010

BOUS100514\_01

BOUS008



Date 14/05/2010

Latitude 43°22.121

Heure déb 11h 10min [TU]

Longitude 07°54.121