

BOUSSOLE Monthly Cruise Report

Cruise 88

June 14 - 16, 2009

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

Vessel: R/V Téthys II

(Captain: Rémy Lafond)

Science Personnel: Céline Bachelier, François Bourrin, Floriane Desprez, Emilie Diamond, Eric Graves, Olivier Javoy, David Luquet, Daniella Mella, Alexandre Mignot, Marc Picheral and Vincenzo Vellucci

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

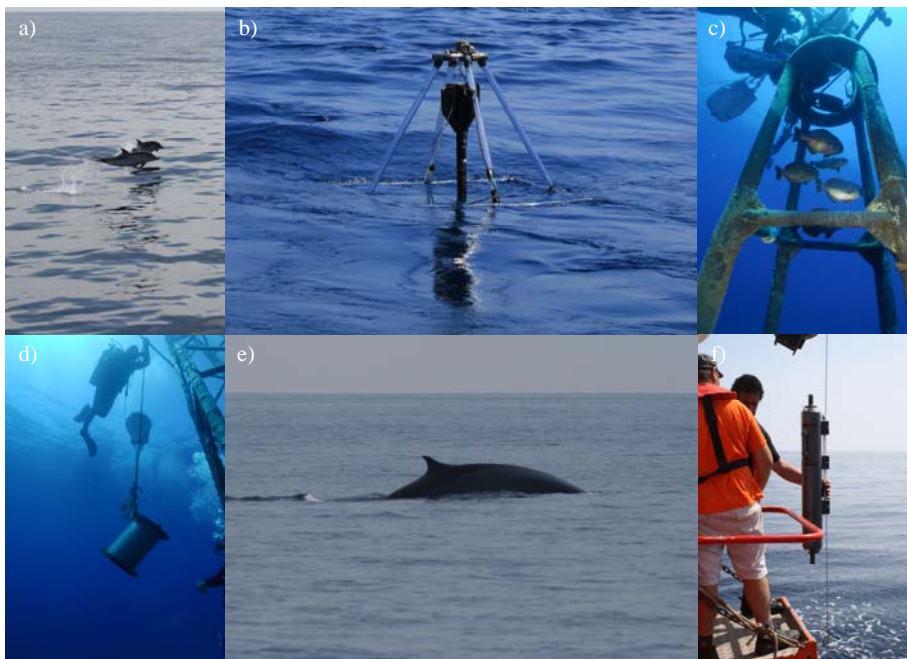


Figure 1. a) Stripped dolphins. b) SPMR surface float with electric release mechanism. c) Barrel fishes. d) Buoy battery substitution. e) Fin whale near the buoy. f) Samples with Niskin bottle.

BOUSSOLE project

ESA/ESRIN contract N° 17286/03/I-OL

Deliverable from WP#400/200

June 21, 2009



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Cruise Objectives

Routine operations

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 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.

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.

Additional operations

Since May 29th, the Junction Box was switched off for cutting the battery charge that was overloaded, causing H₂ production. Changing the battery will be a priority when divers will be on board. One of the three days, Céline Bachelier and Floriane Desprez will complete the MOOSE programs with a deep CTD cast and water sampling. One of the three days, Marc Picheral will be on board to perform a PVM 0-1000 m profile and two Plankton Net 0-100 m profiles at the BOUSSOLE site. Daniella Mella from the Biologic Station of Roscoff will be on board for sampling at the Boussole site for DNA cyanobacteria extraction

Cruise Summary

Sea state was calm for all of the three cruise days. The first day was mainly used for optical casts and sampling. CTD cast at the BOUSSOLE site and along the transect were also planned but it did not work for the rest of the cruise. The second day was mainly used for diving on the buoy to change the battery, cleaning the optical sensors, perform dark measurements and recover the hydrophone. This day was also used for buoy data retrieval, for optical and PVM casts and for sampling at the BOUSSOLE site. The third day was used for verifying the buoy functioning, for optical and CTD casts and for sampling at the BOUSSOLE site. The manual CIMEL was still not available.

Sunday 14 June 2009

The first day, sea state was good with very low wind blowing and blue sky. When arrived at the BOUSSOLE site, there was a connection problem with the CTD on the rosette. After several attempts of connection between the computer and the CTD, 4 SPMR profiles with the new pyramid and 2 Secchi disks were performed. Surface water was collected with a bucket. The CTD will not work for the rest of the mission and the transect will not be sampled on this cruise.

Monday 15 June 2009

The second cruise day, sea state was good with very low wind blowing and blue sky. When arrived on site, divers went at sea to take off the buoy battery and the hydrophone and to clean the instruments. Then, 2 plankton net samples were collected and 1 PVM profile was performed. After, divers went again at sea to install the battery recovered from the buoy system#1. Neoprene caps were also put on the HS4 and on the transmissometers for acquiring three dark measurements. Then, 3 SPMR profiles (without pyramid), 1 Secchi disk and surface water sampling with a bucket were performed. The buoy was then restarted and a CISCO connection was established for data retrieval. Battery voltage was now within ordinary values.

Tuesday 16 June 2009

The third cruise day, sea state was good with very low wind blowing and blue sky. When arrived on site, 3 SPMR profiles and 1 Secchi disk were performed. Water samples were collected by closing a Niskin bottle with a messenger on the hydrologic cable. 4 CTD sensors were then tested to 2000 m and 1 SPMR profile was performed. A connection with the buoy in the late morning revealed that the battery voltage was again too high. So an attempt to disconnect two solar panels from the J/Box was made. However it was not possible to establish a connection with the buoy to verify again the battery voltage so the J/Box was again switched off.

Cruise Report

Sunday 14 June 2009 (UTC)

People on board: Céline Bachelier, Emilie Diamond, Daniella Mella, Alexandre Mignot and Vincenzo Vellucci.

0515 Departure from the Nice port.
0835 Arrival at the BOUSSOLE site.
0845 CTD does not work.
0910 SPMR 01, 02, 03 with pyramid.
1035 Secchi disk 01 (18 m).
1200 Water sampling with bucket at surface for HPLC, Ap and TSM.
1205 SPMR 04 with pyramid
1300 Secchi disk 02 (21 m).
1310 Departure to the Nice port.
1630 Arrival at the Nice port.

Monday 15 June 2009 (UTC)

People on board: Céline Bachelier, François Bourrin, Emilie Diamond, Eric Graves, Olivier Javoy, David Luquet, Marc Picheral and Vincenzo Vellucci.

0500 Departure from the Nice port and immediate return. Forgotten PVM connection cables in the lab.
0530 Departure from the Nice port.
0900 Arrival at the BOUSSOLE site.
0915 Diving on the buoy for taking off the battery and the hydrophone and for cleaning instruments.
0945 2 x Plankton net, 0-100 m.
1110 PVM, 0-1000 m.
1200 Diving on the buoy for installing the battery. The buoy was restarted. Dark HS4 and transmissometers at 13:00, 13:15 and 13:30.
1230 SPMR 05, 06, 07.
1315 Secchi disk 03 (23 m).
1330 Water sampling with bucket at surface for HPLC, Ap and TSM.
1415 CISCO connection with the buoy and data retrieval.
1430 Departure to the Nice port.
1735 Arrival at the Nice port.

Tuesday 16 June 2009 (UTC)

People on board: Céline Bachelier, Floriane Desprez, Emilie Diamond, Daniella Mella and Vincenzo Vellucci.

0415 Departure from the Nice port.
0730 Arrival at the BOUSSOLE site.
0735 SPMR 08, 09, 10.
0820 Secchi disk 04 (23 m).

0900 Niskin bottle for water sampling at 5, 10, 20, 30, 40, 50, 60, 70, 80, 150 and 200 m for HPLC, Ap and TSM.
0930 CTD 01, 2000 m.
1045 Niskin bottle for water sampling at 10, 30, 45 and 60 m for DNA extraction.
1115 Attempt CISCO connection with the buoy: successful.
1125 Niskin bottle for water sampling at 1000 m for particles traps.
1215 Disconnection of 2 solar panels.
1240 SPMR 11.
1315 Attempt CISCO connection with the buoy: unsuccessful.
1320 Shut down of the Junction Box.
1330 Departure to the Nice port.
1645 Arrival at the Nice port.

Calculated Swath paths for the MERIS Sensor (ESOV Software)

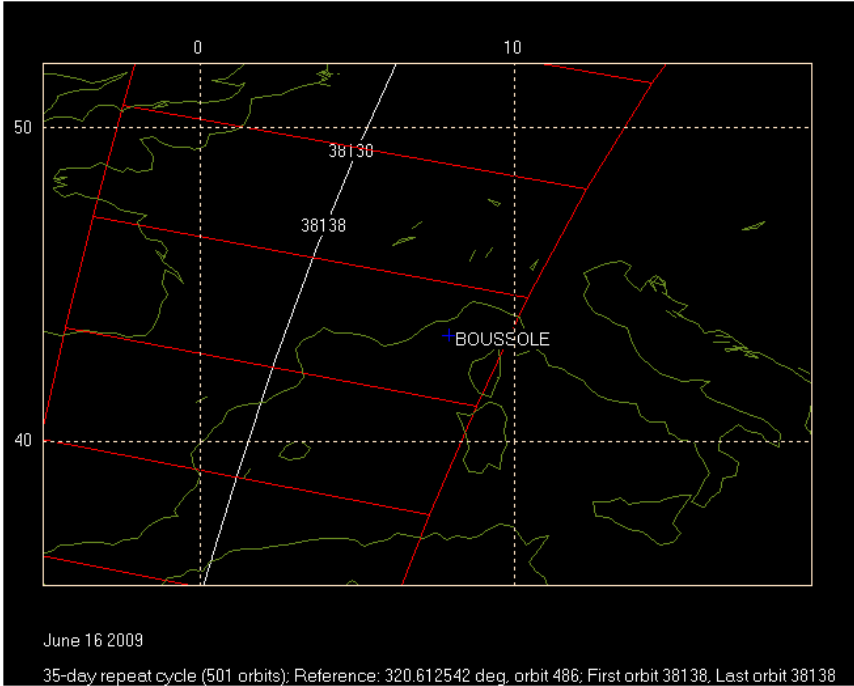
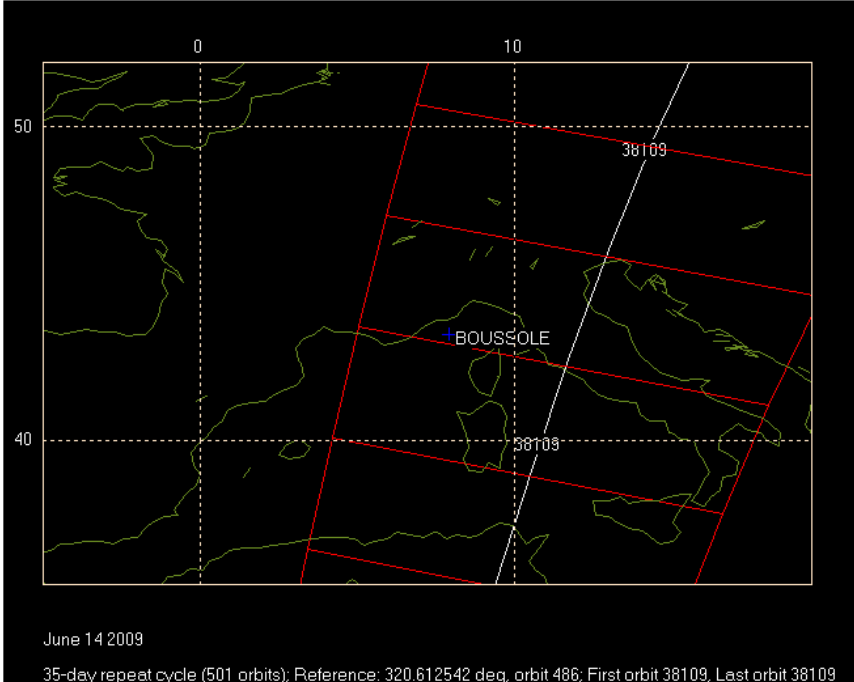
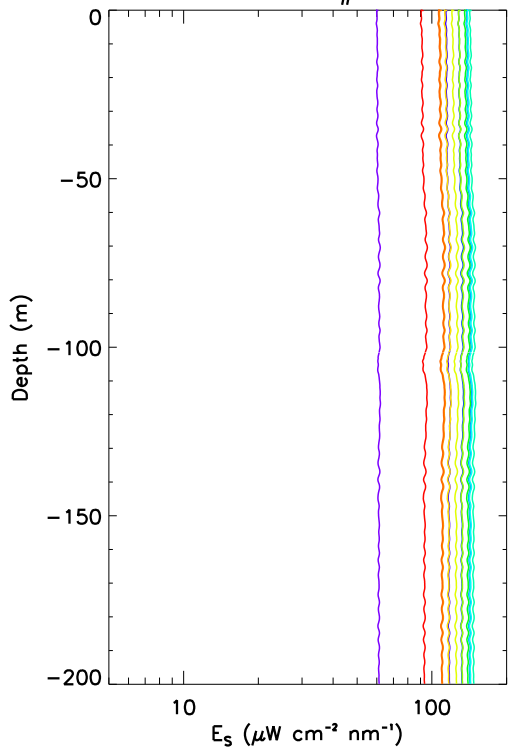


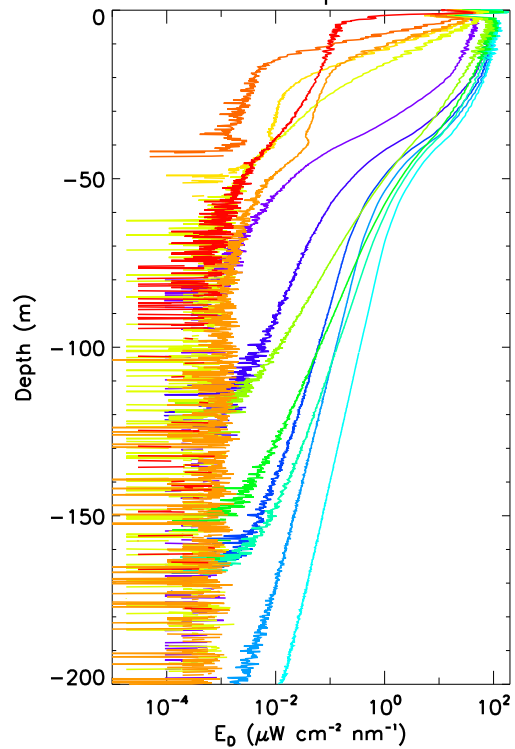
Figure 2. Calculated swath paths for MERIS (Esov software) above BOUSSOLE site for 14 and 16 June 2009.

Appendix

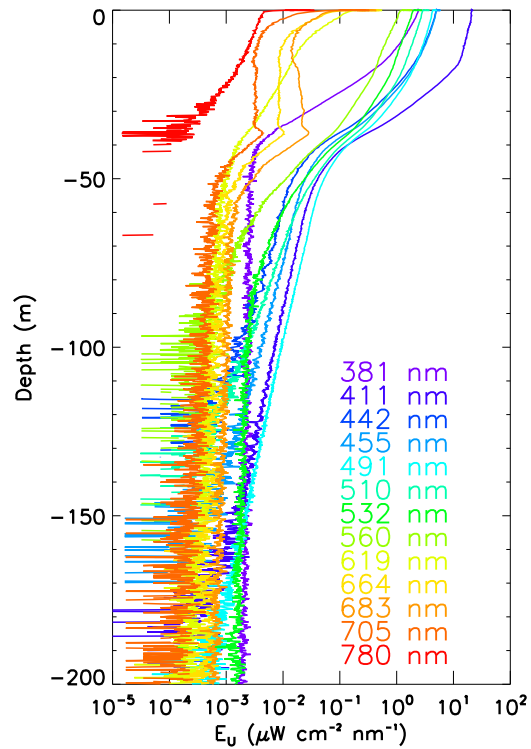
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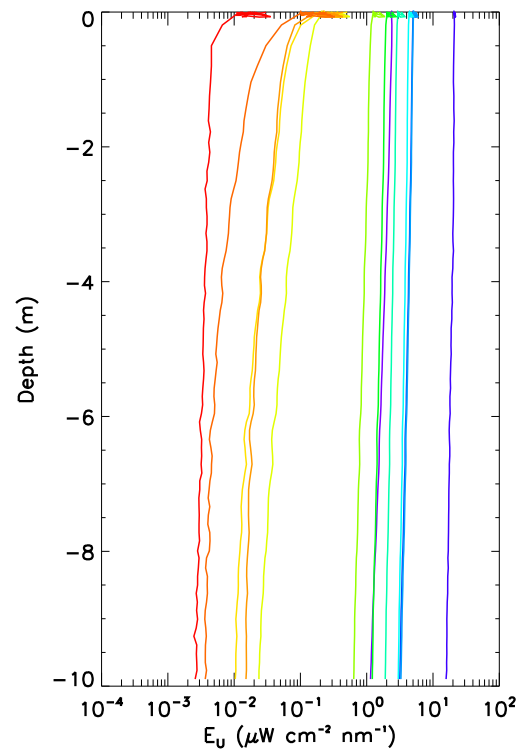
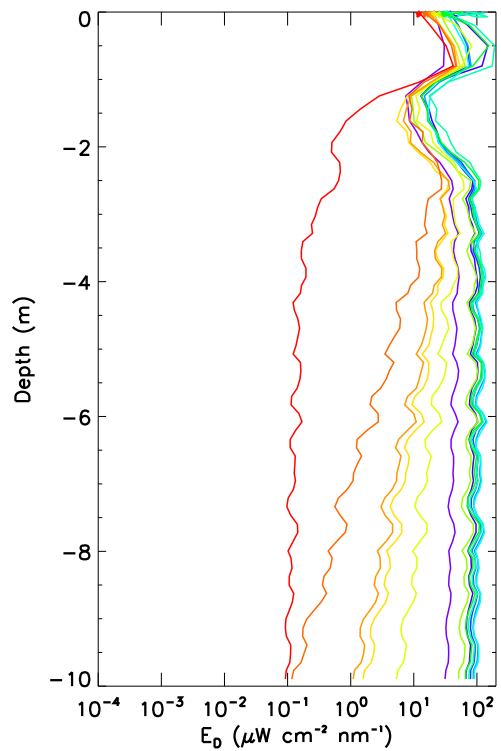
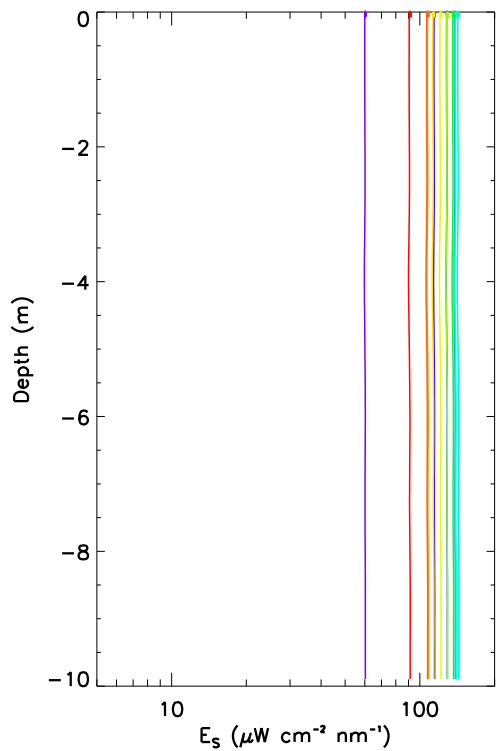
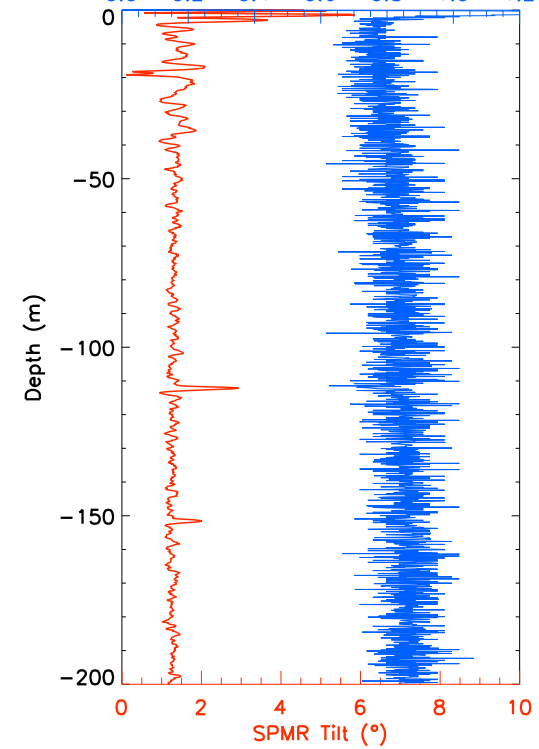
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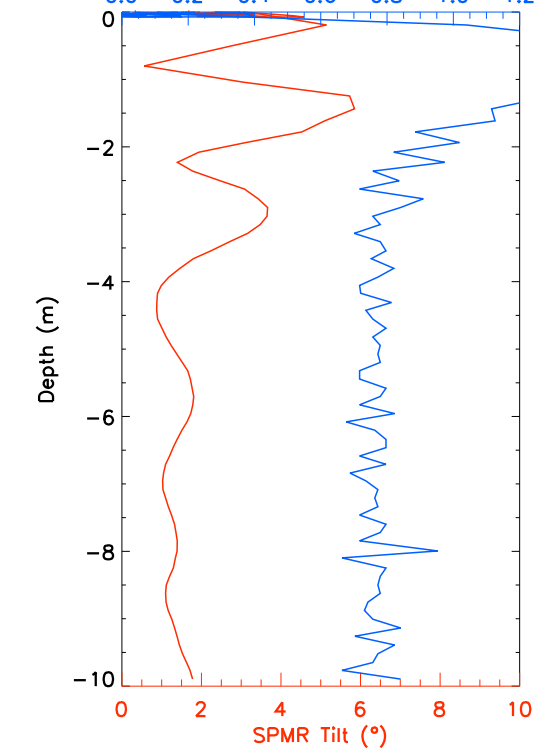
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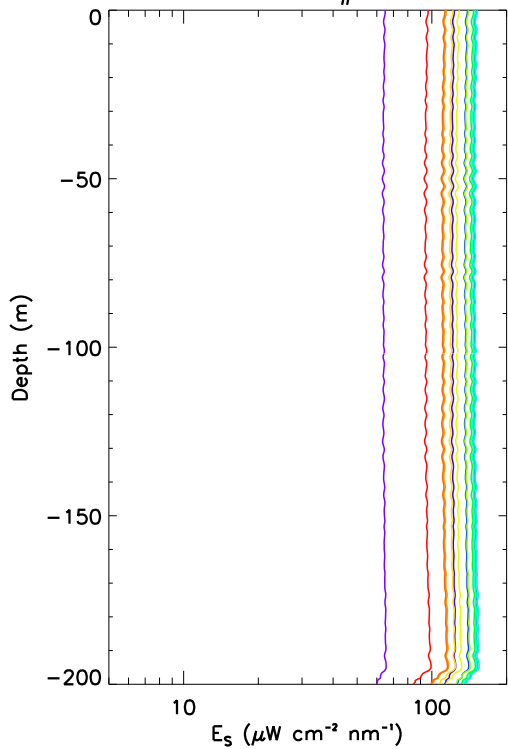
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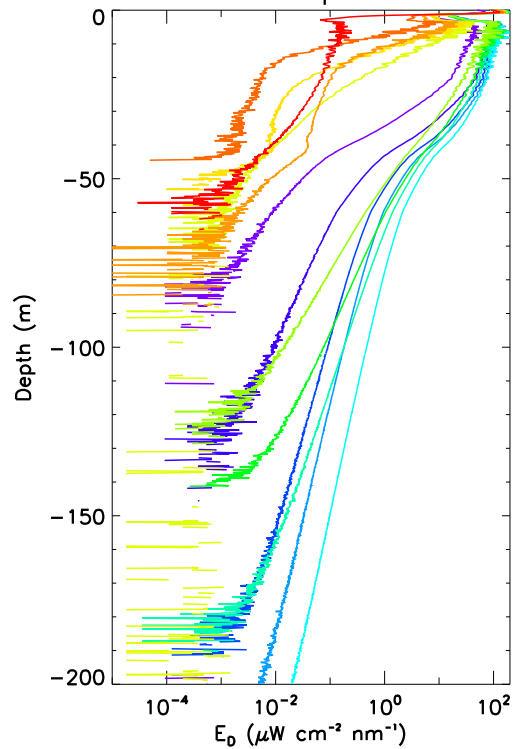
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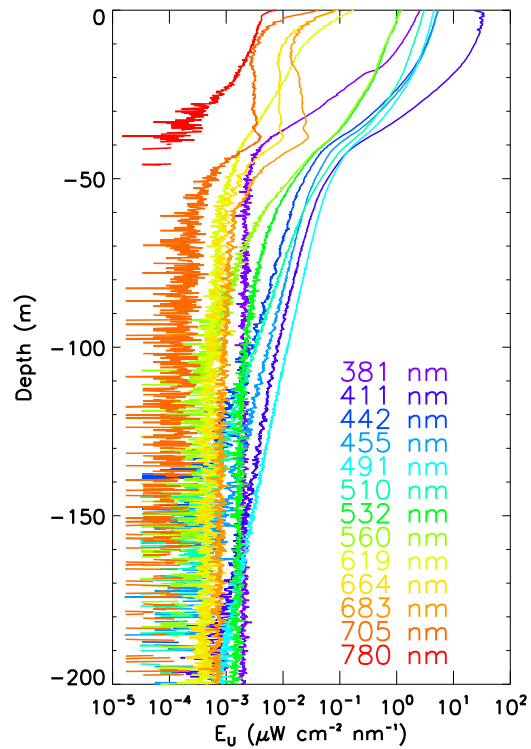
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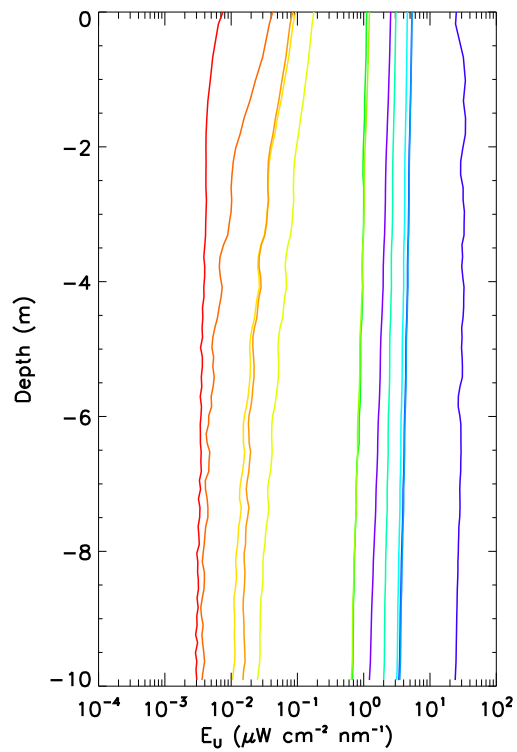
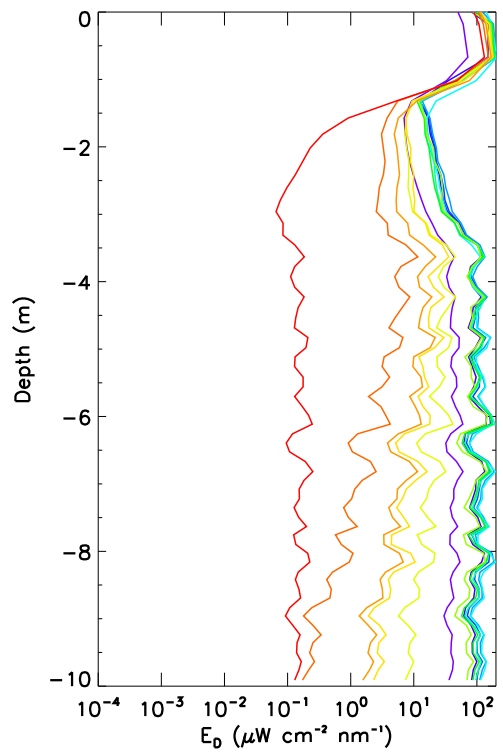
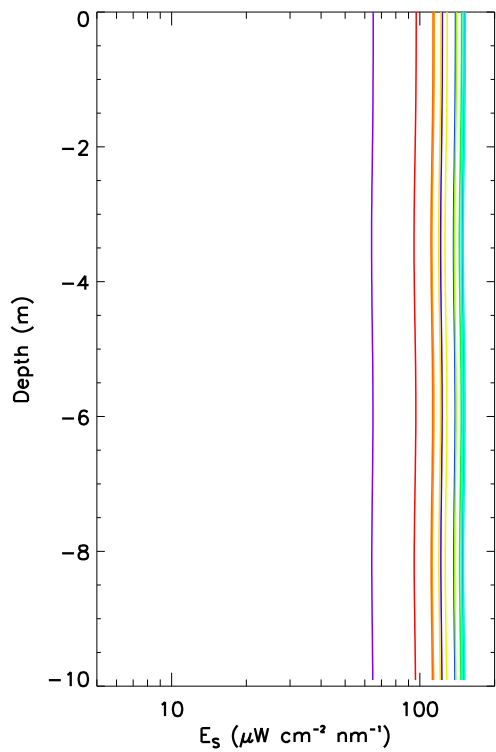
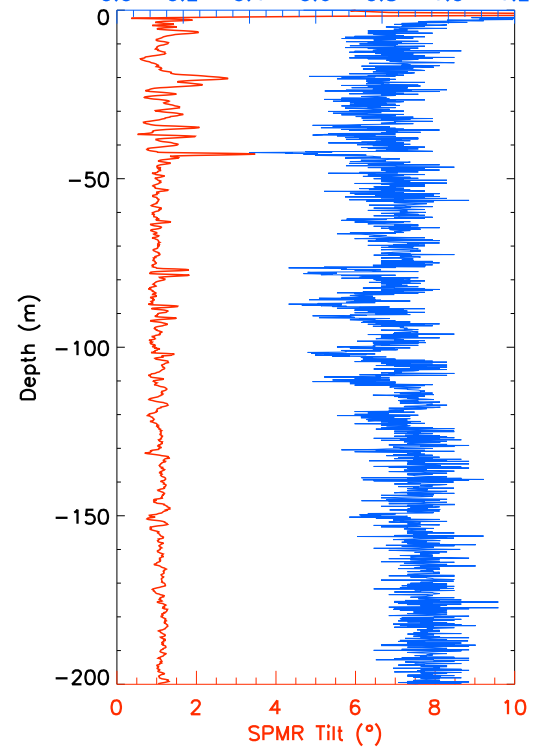
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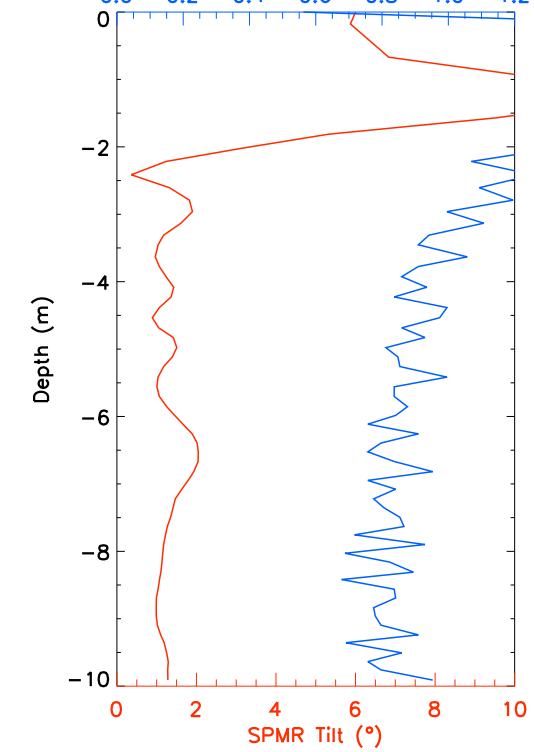
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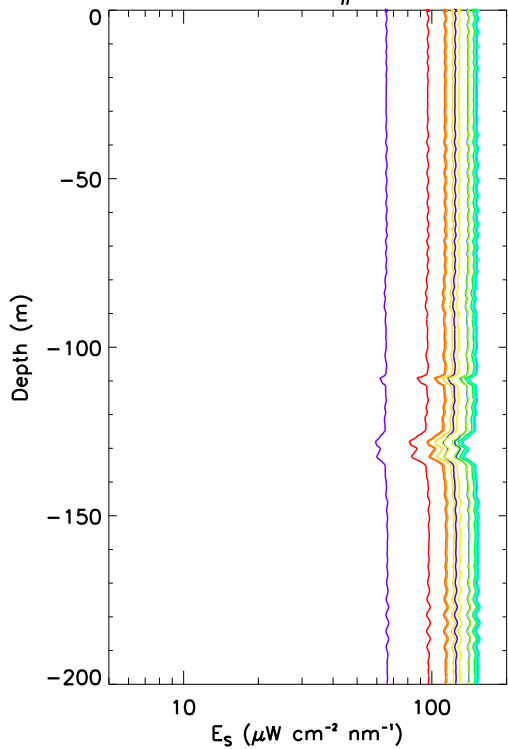
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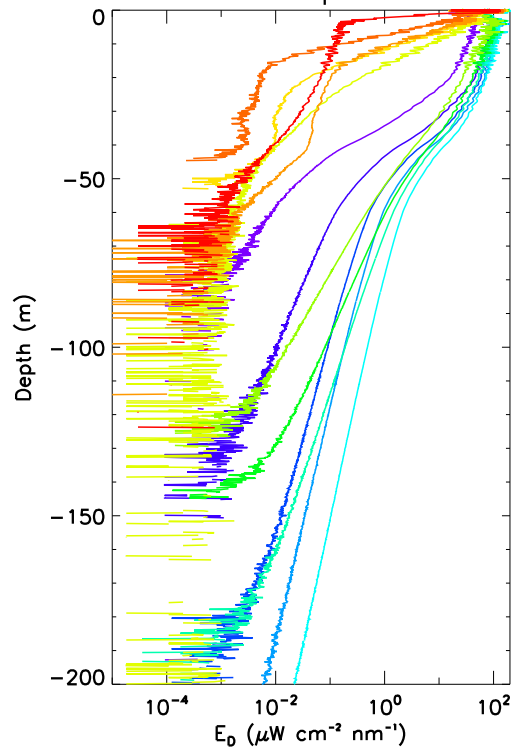
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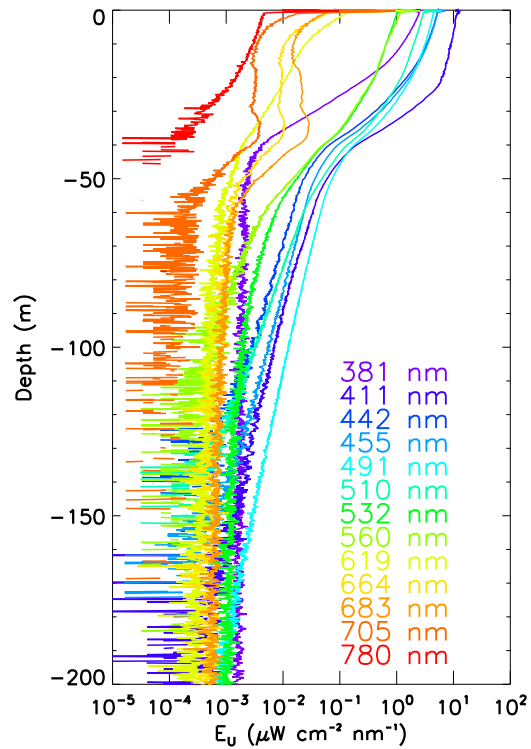
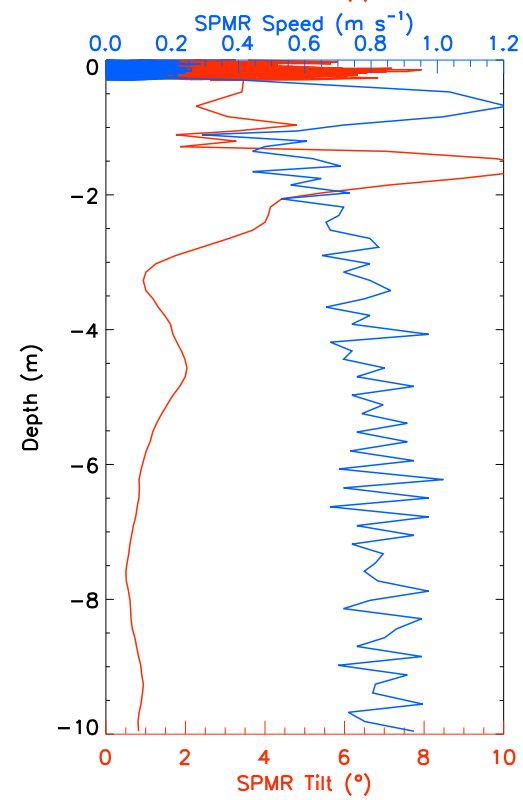
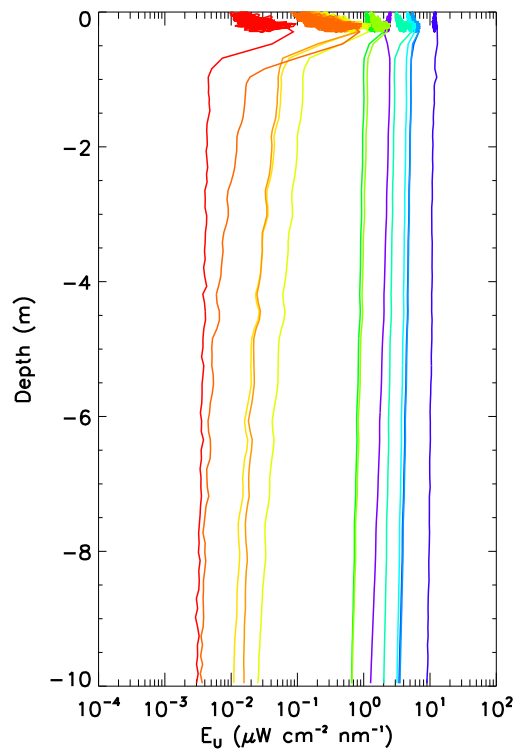
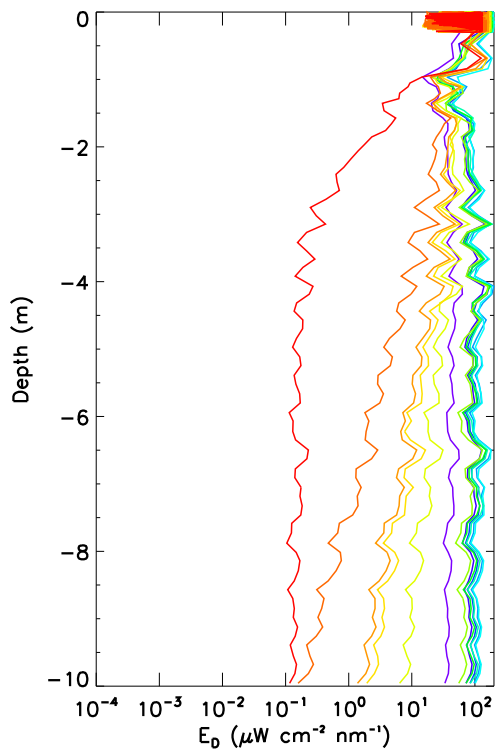
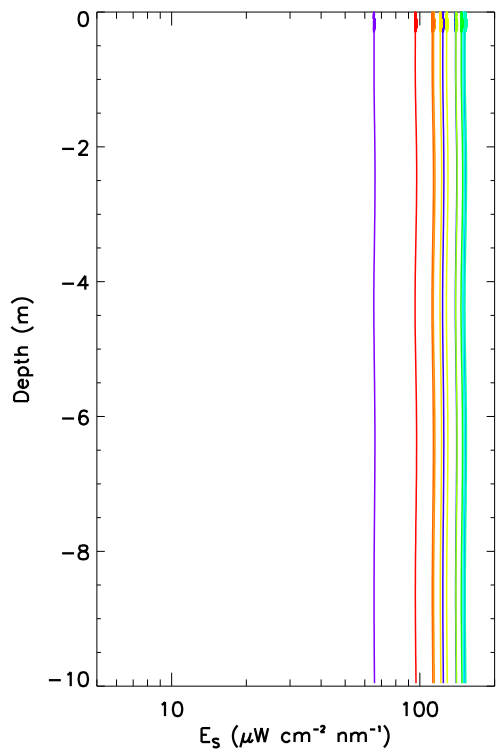
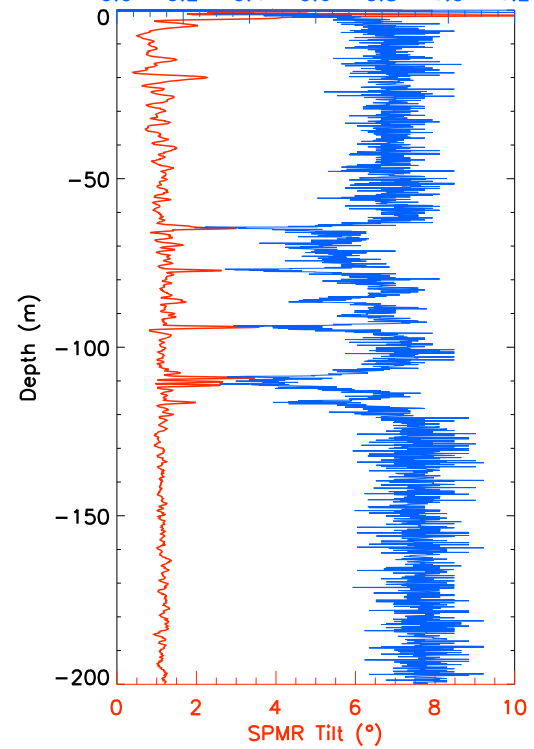
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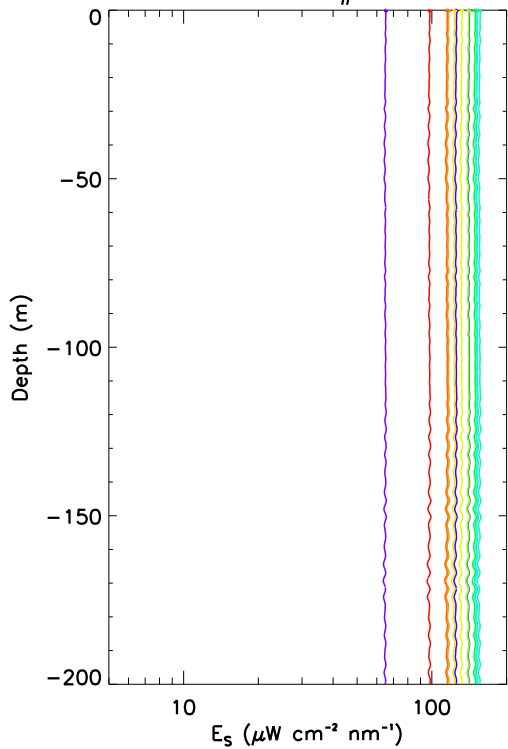
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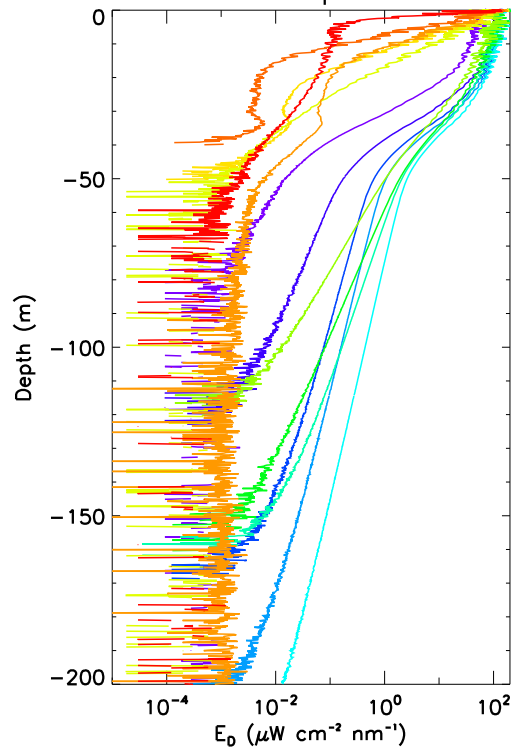
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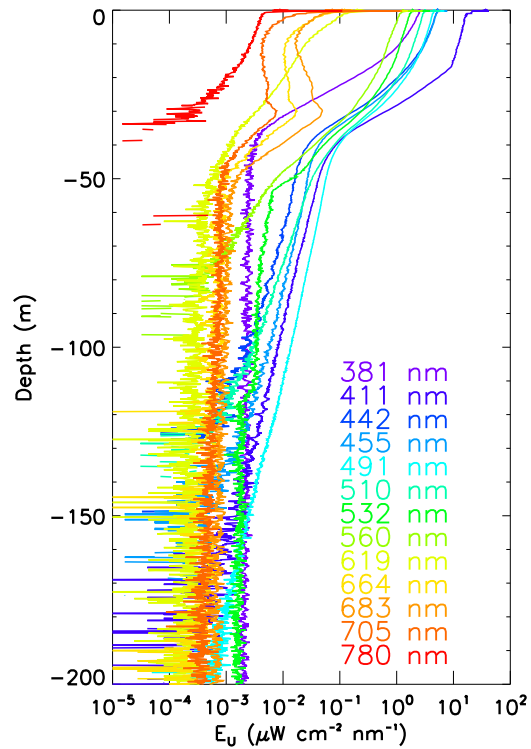
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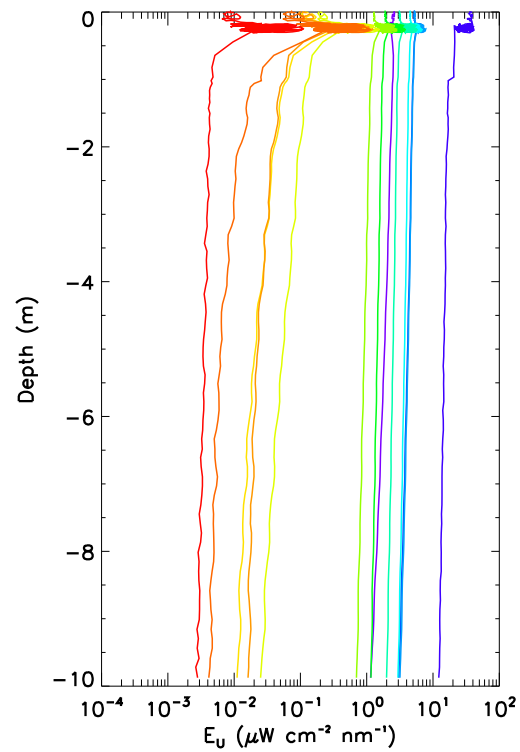
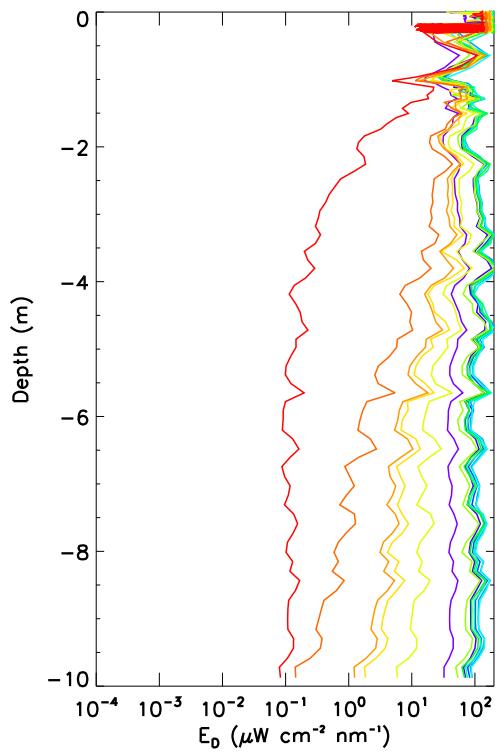
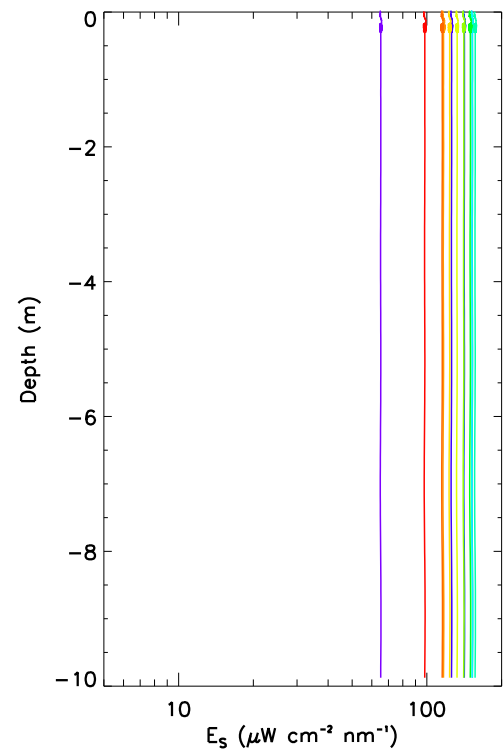
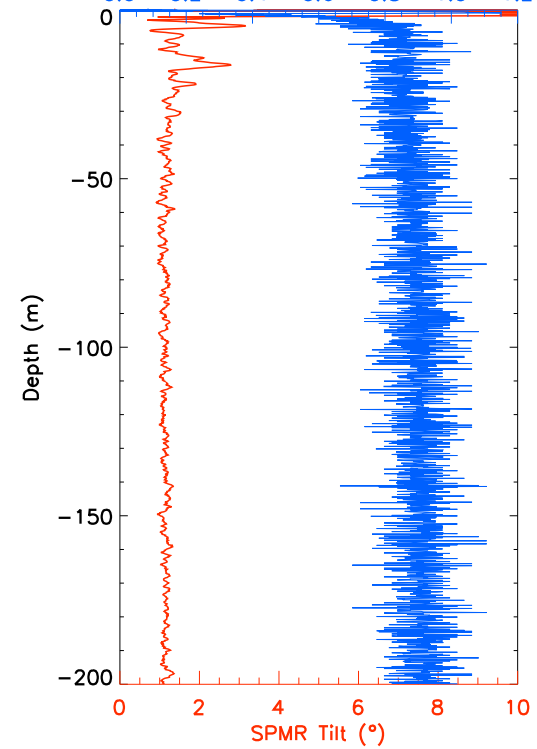
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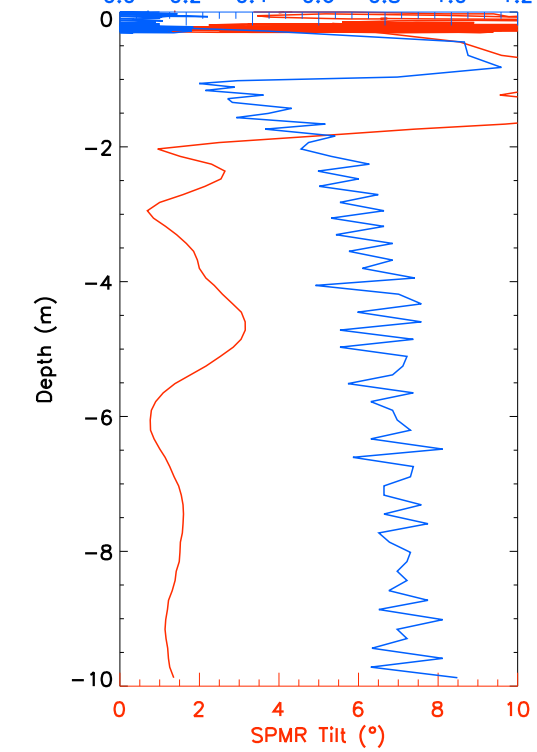
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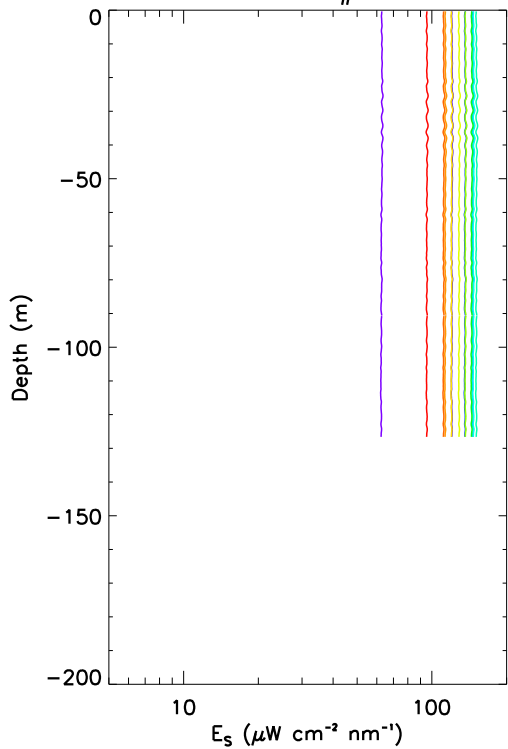
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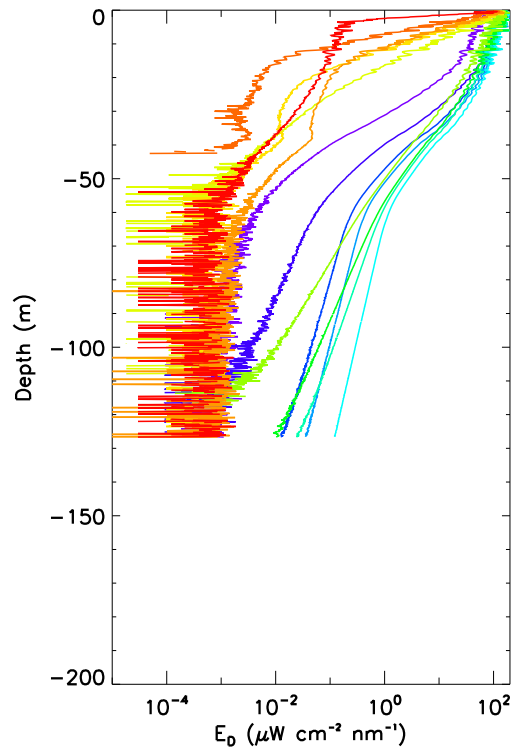
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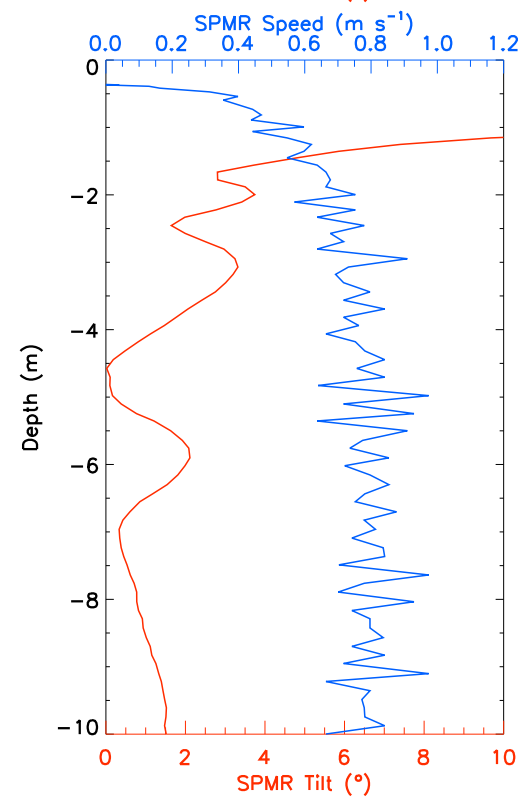
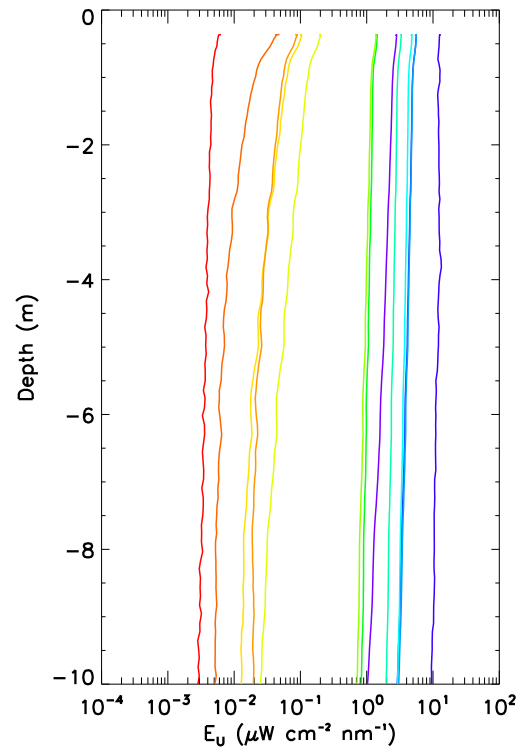
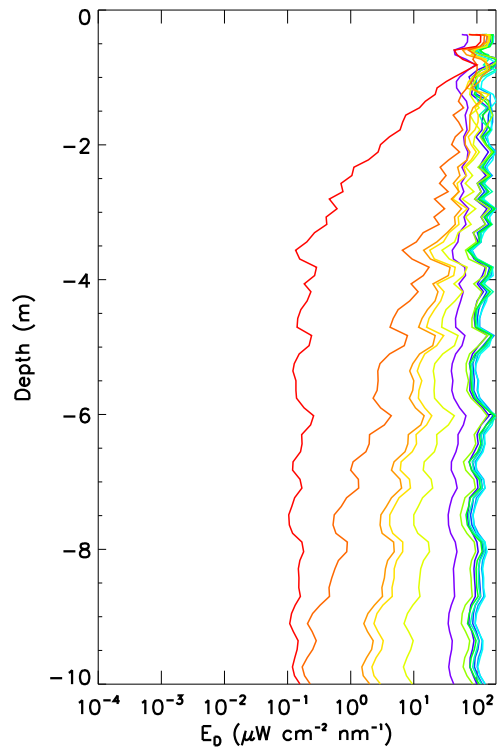
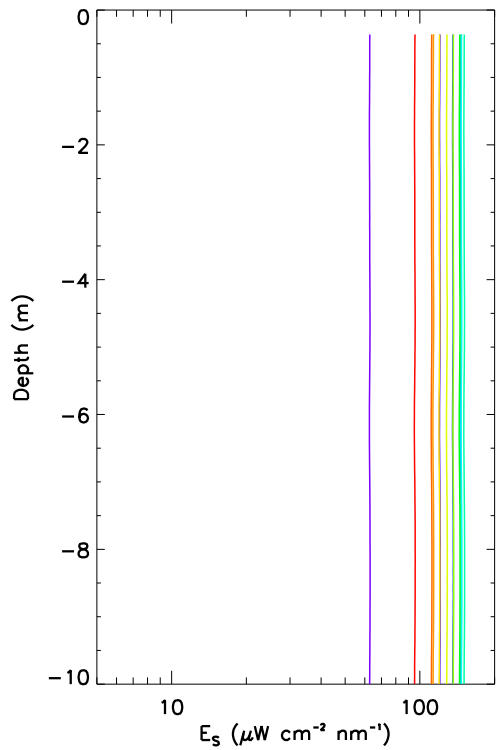
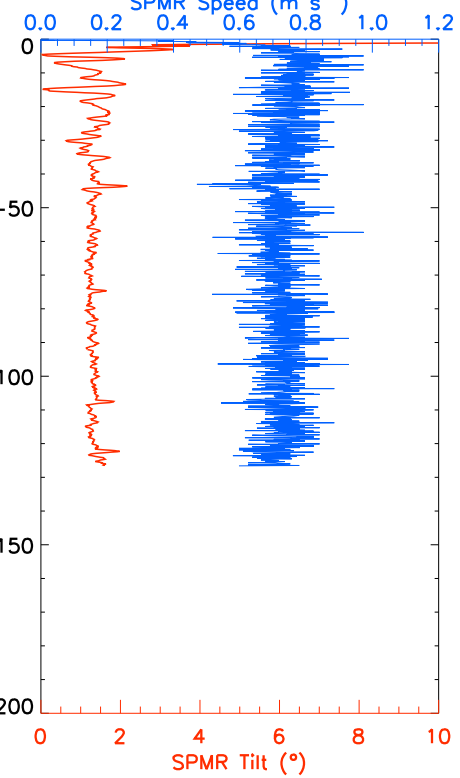
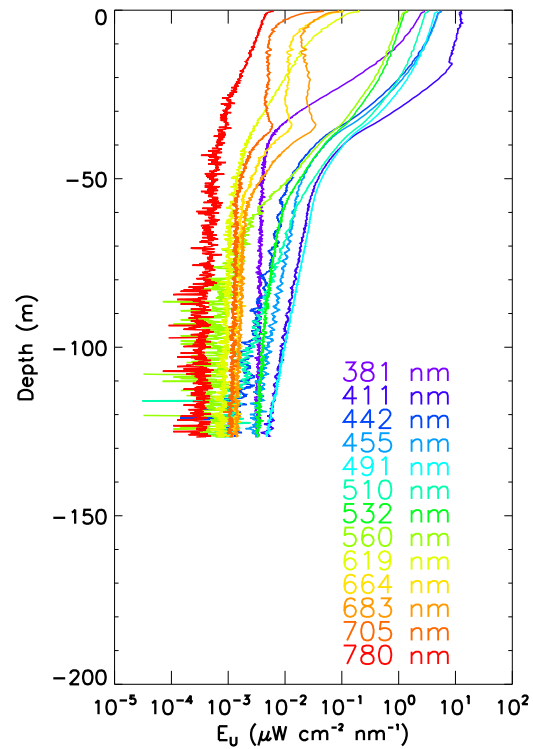
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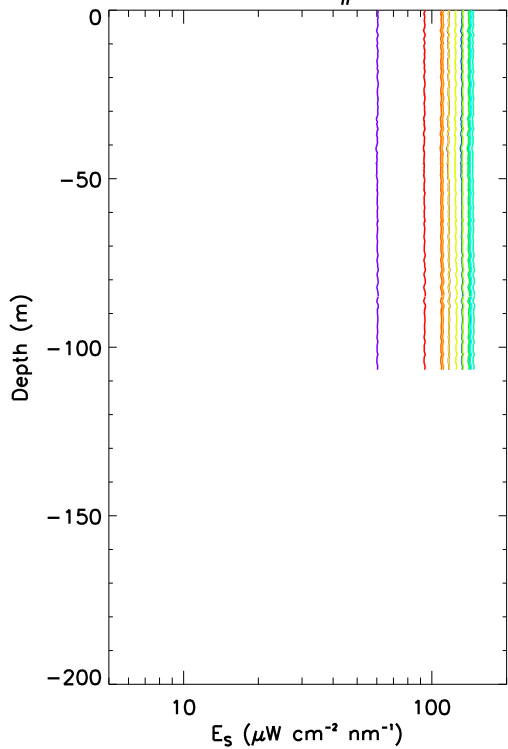
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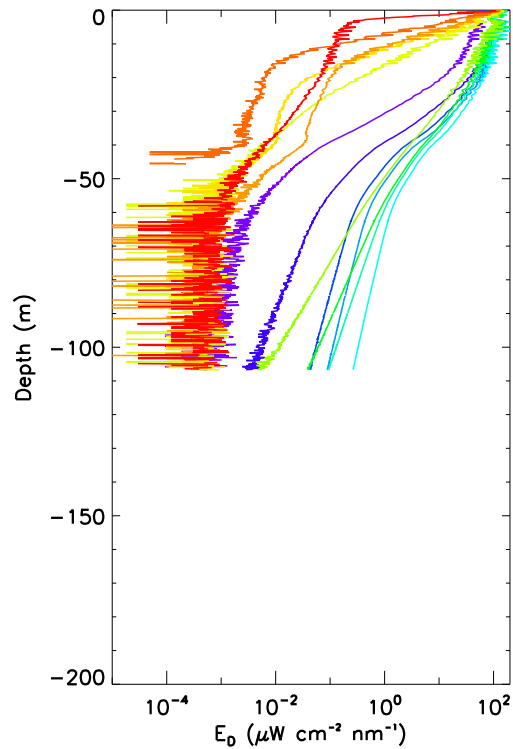
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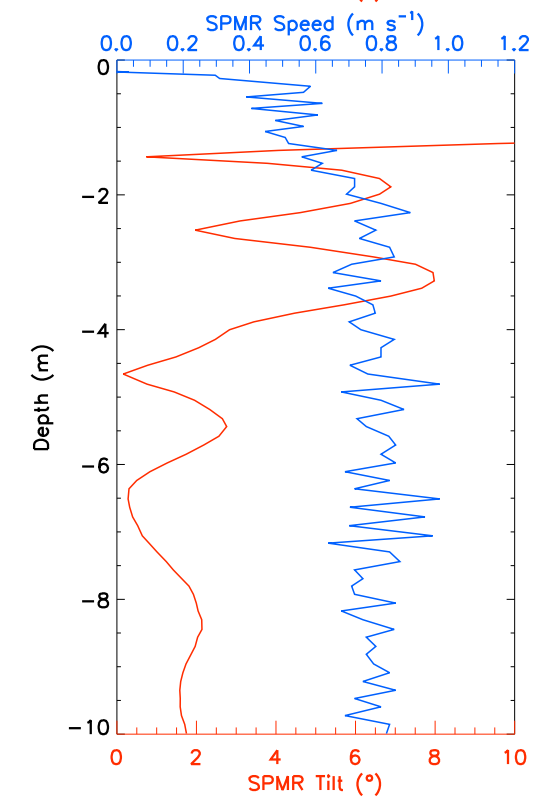
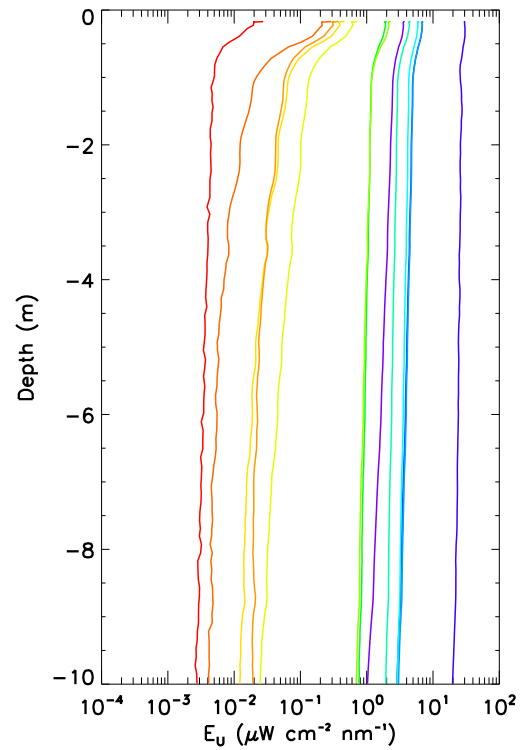
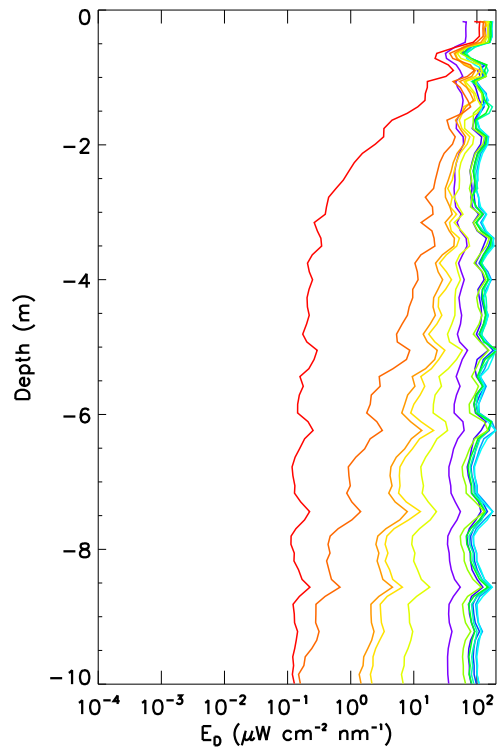
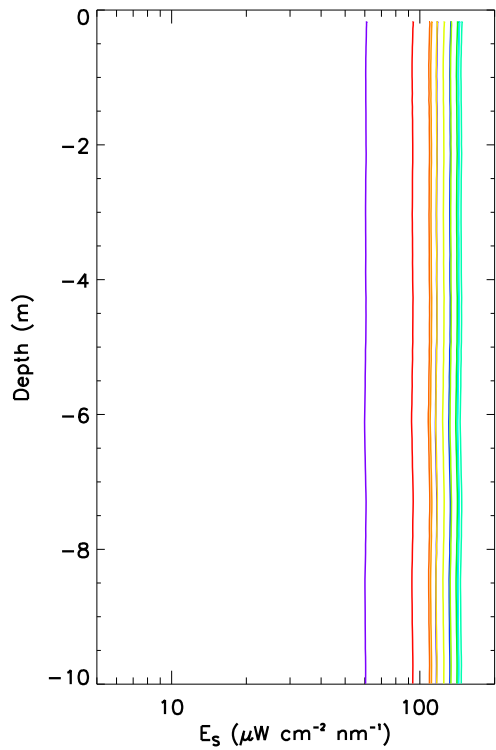
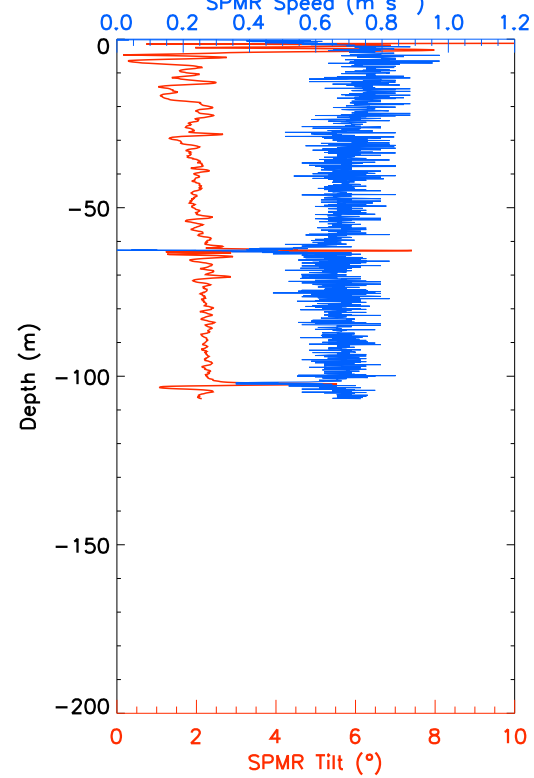
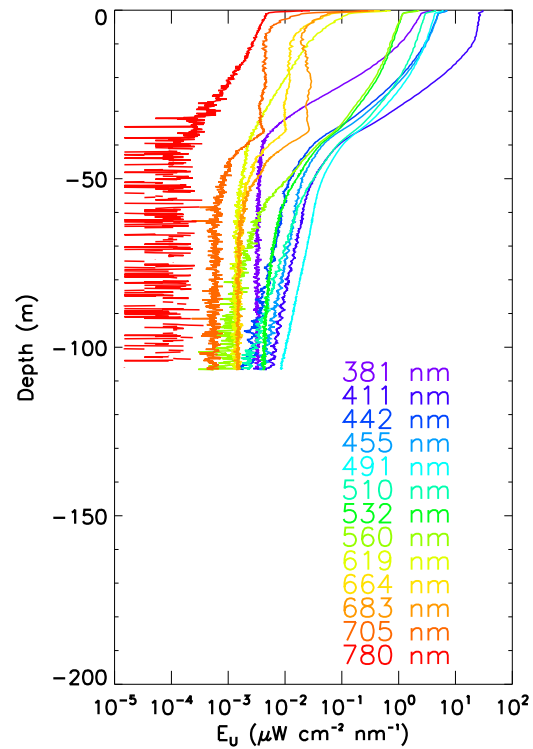
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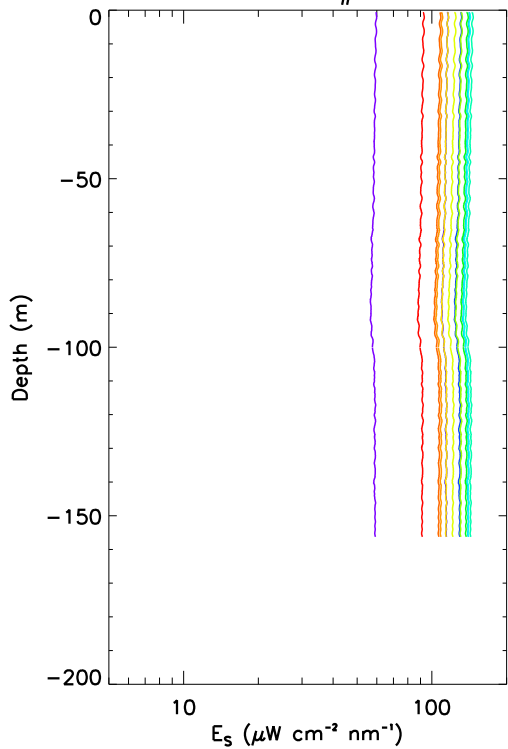
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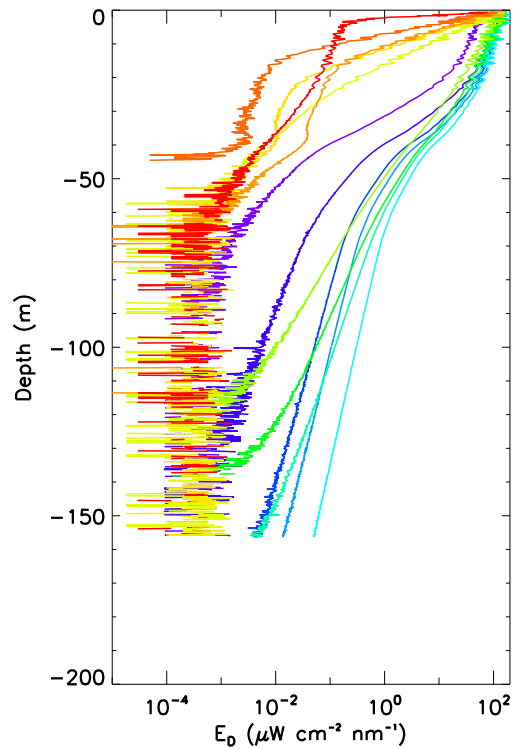
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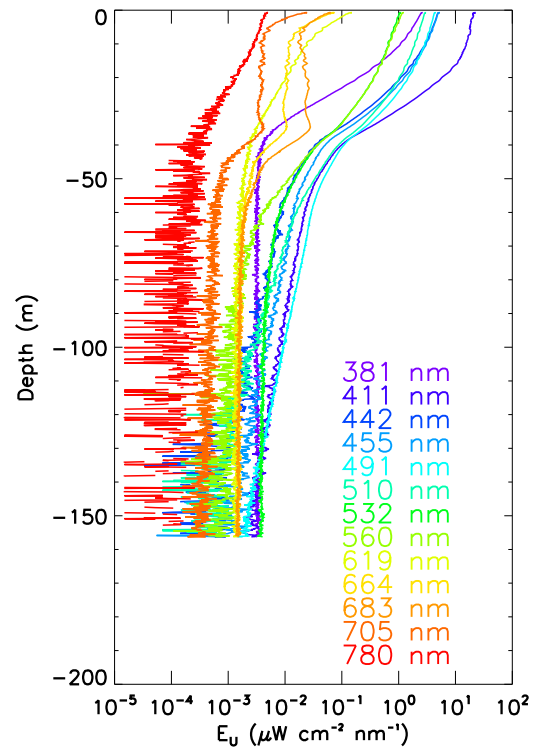
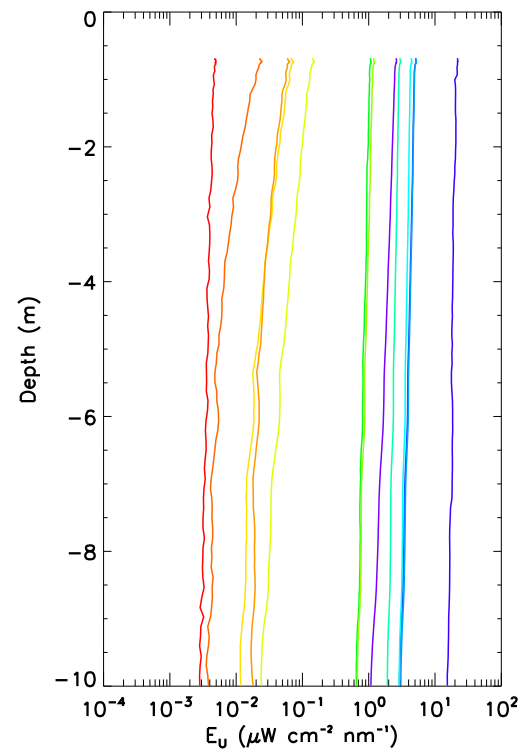
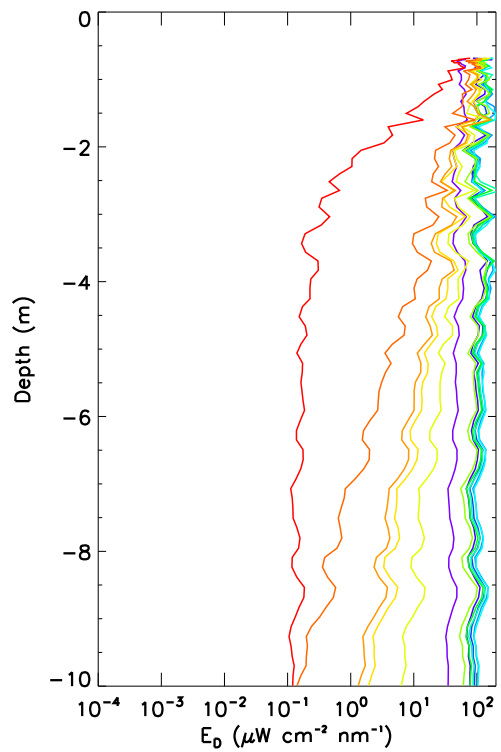
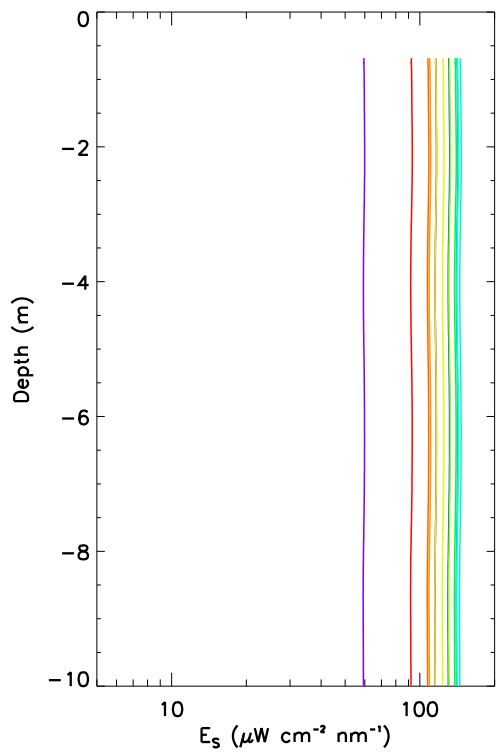
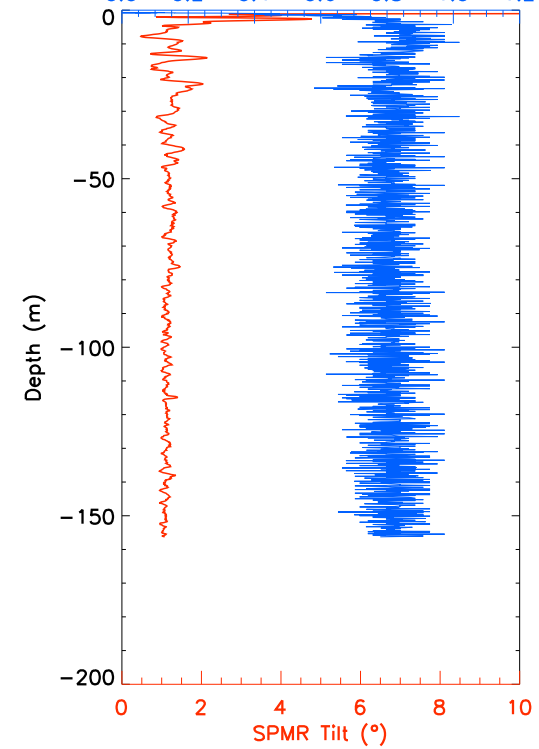
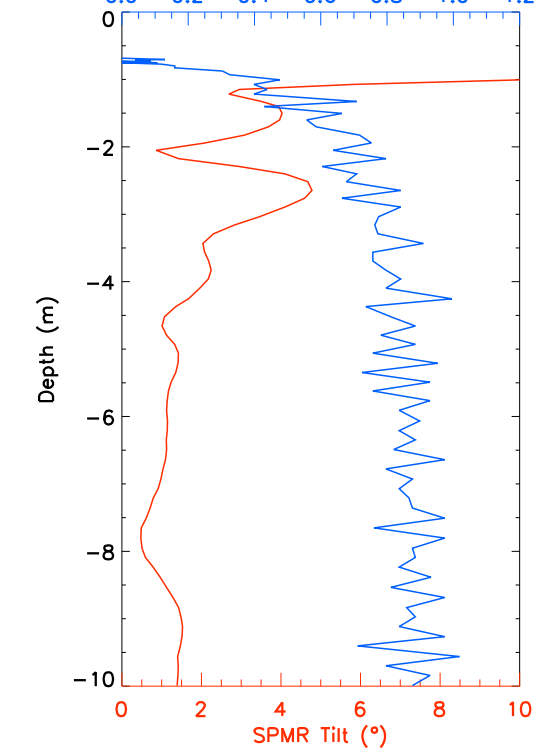
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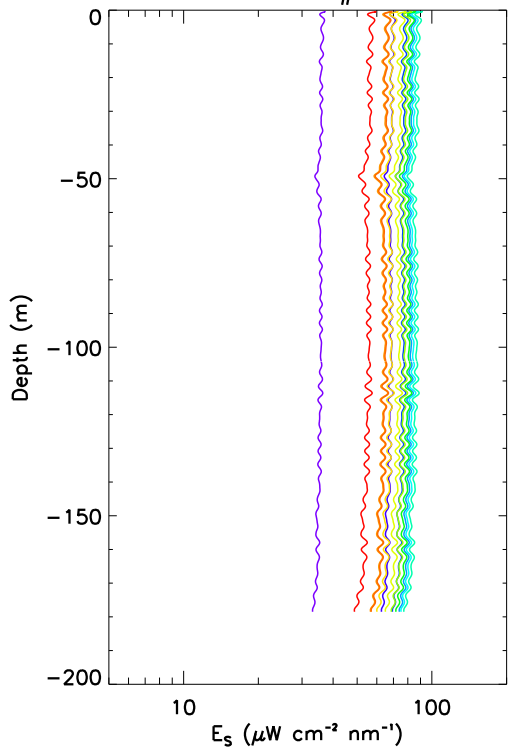
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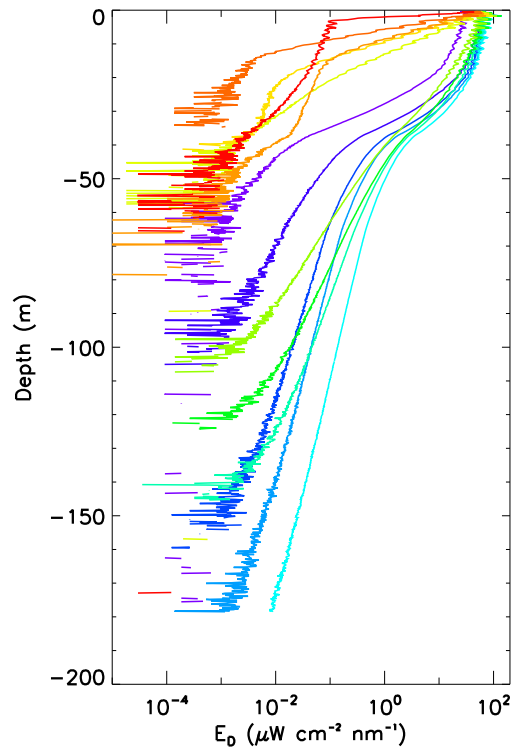
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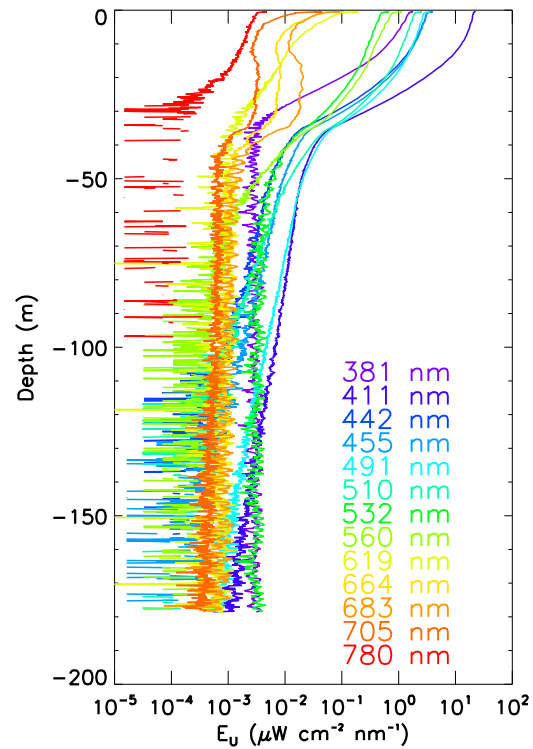
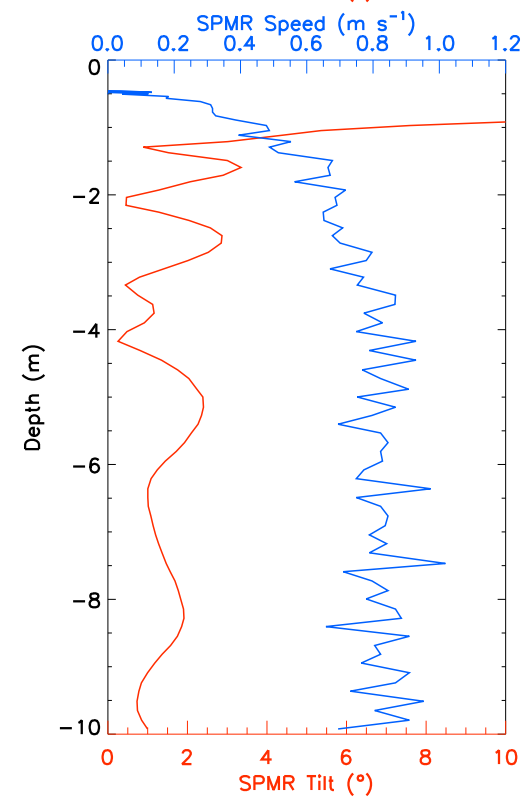
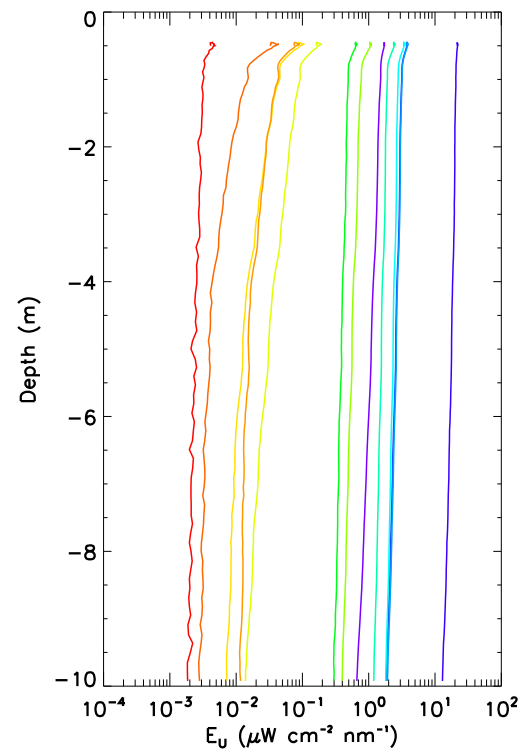
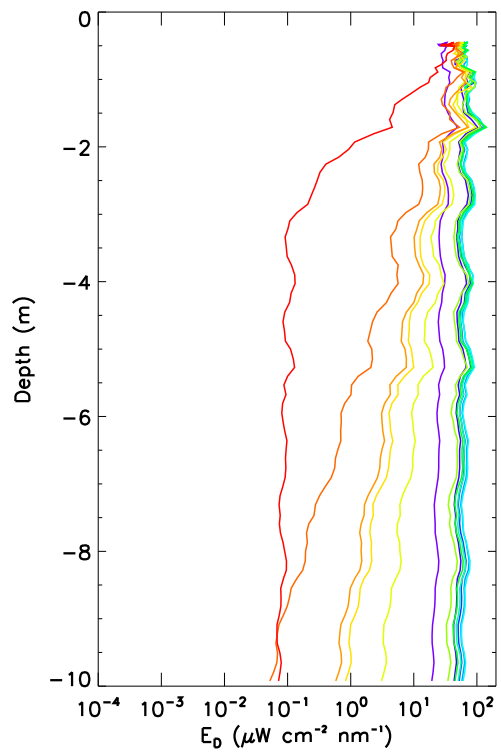
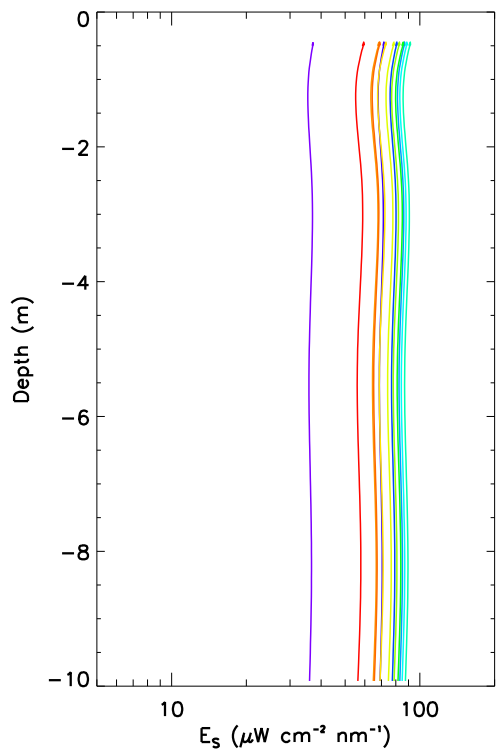
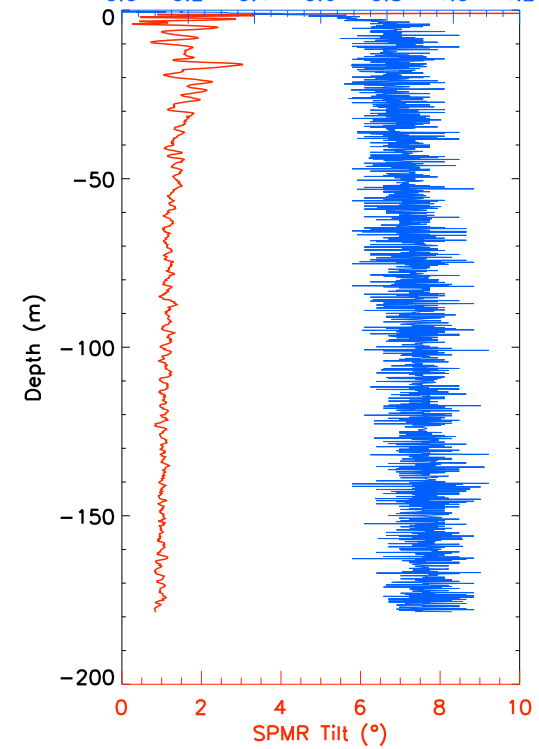
Boussole#88



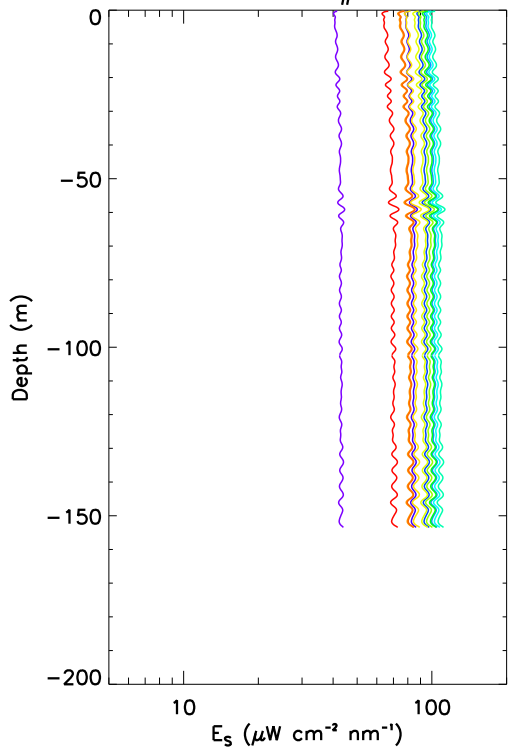
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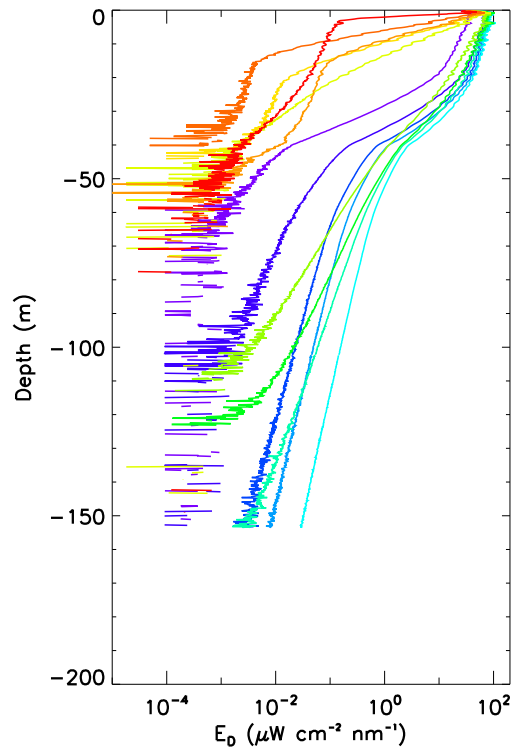
7:46 UTC

SPMR Speed (m s^{-1})

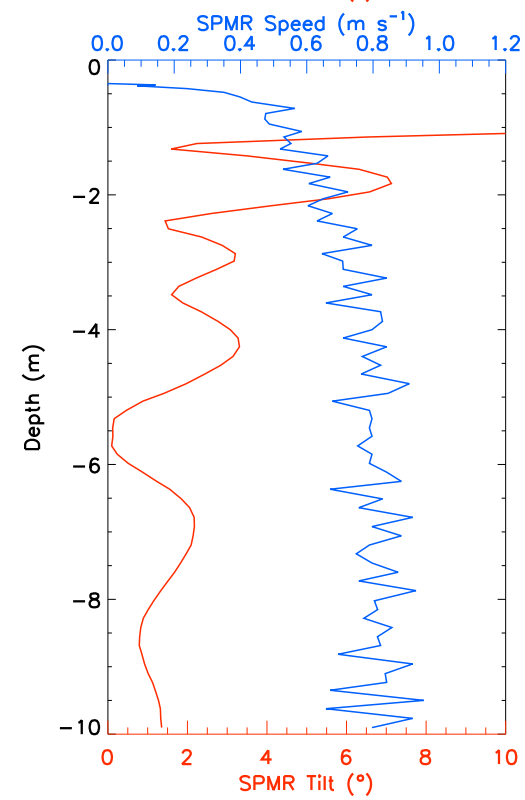
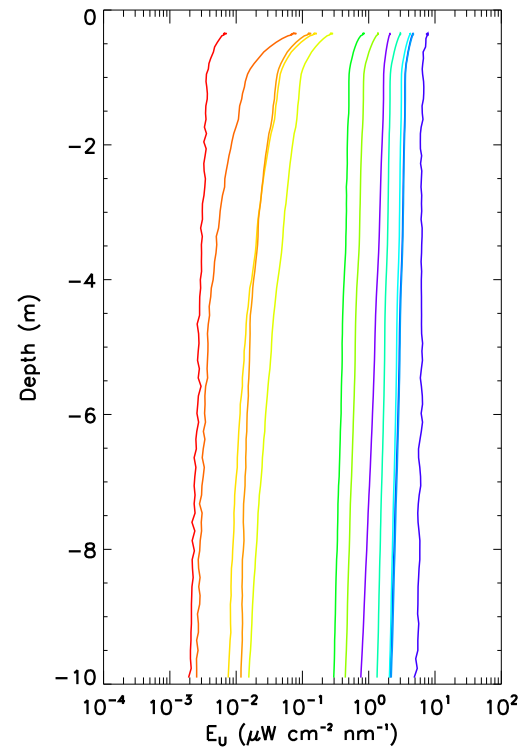
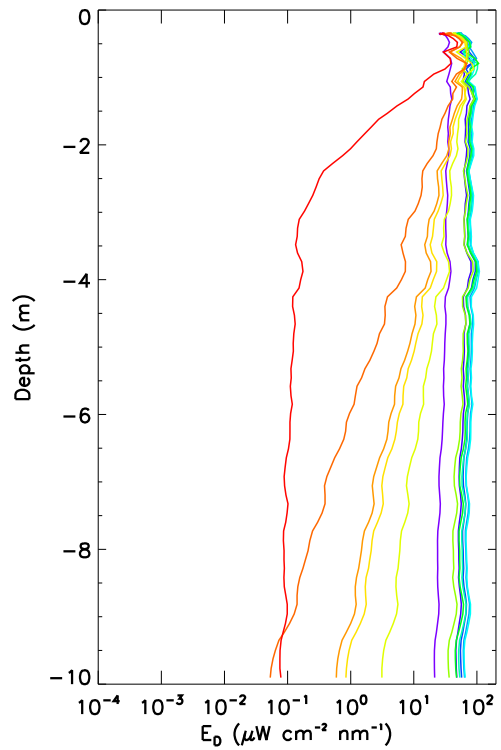
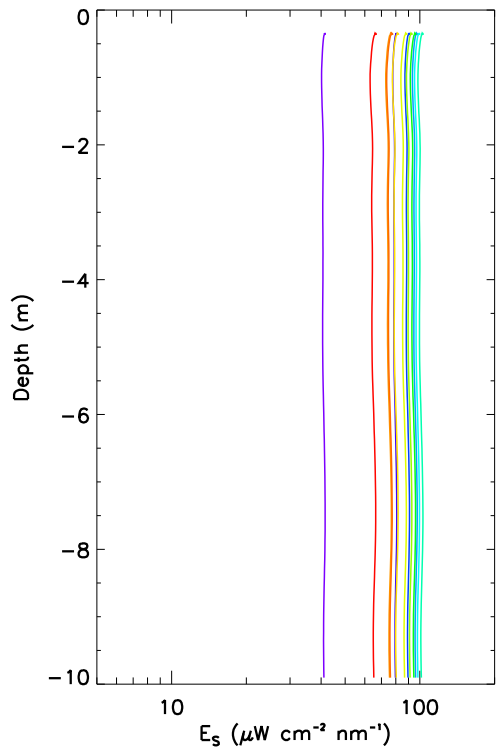
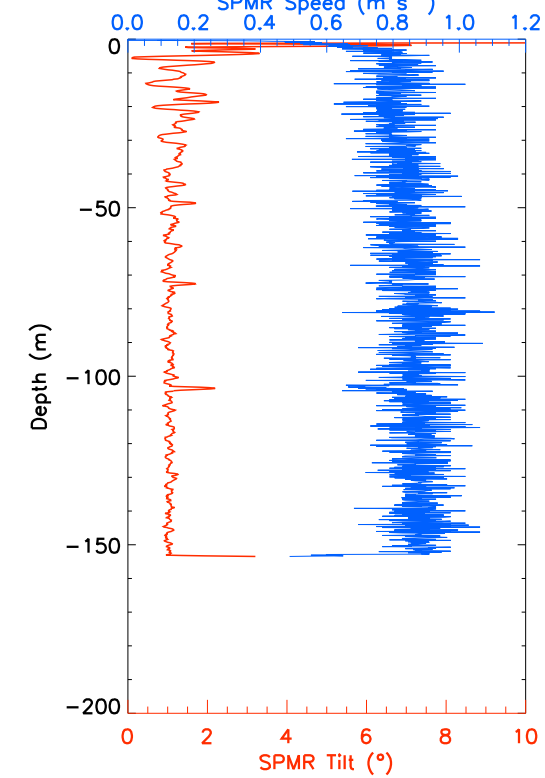
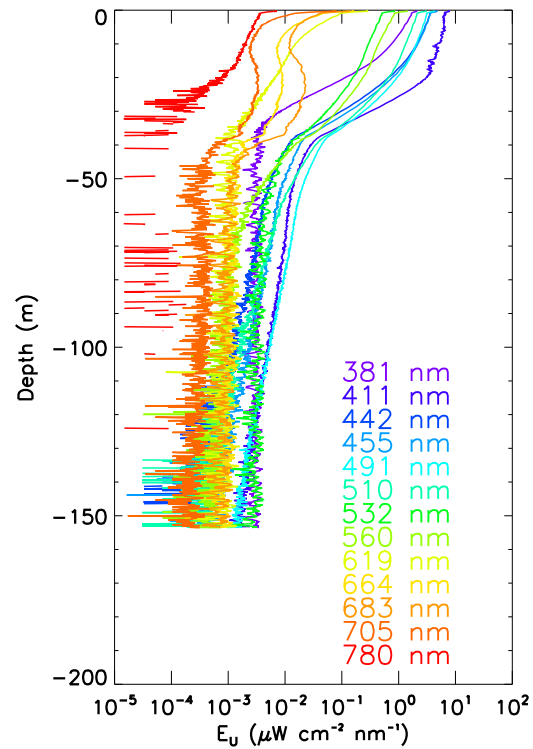
Boussole#88



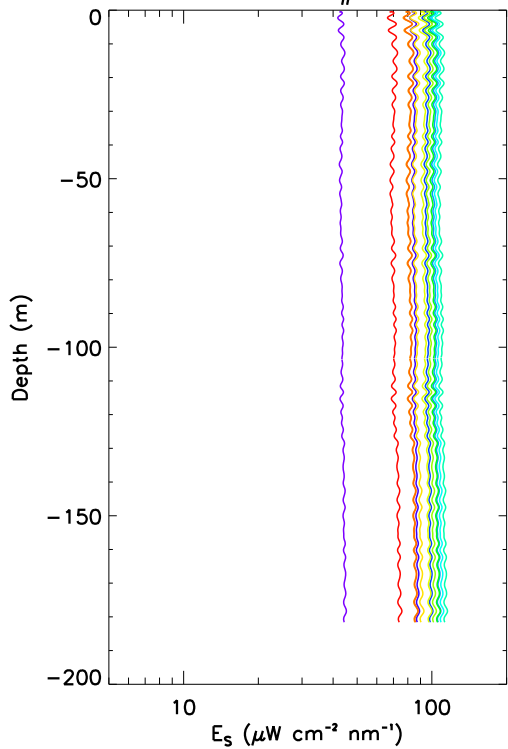
B88_Bou160609AB



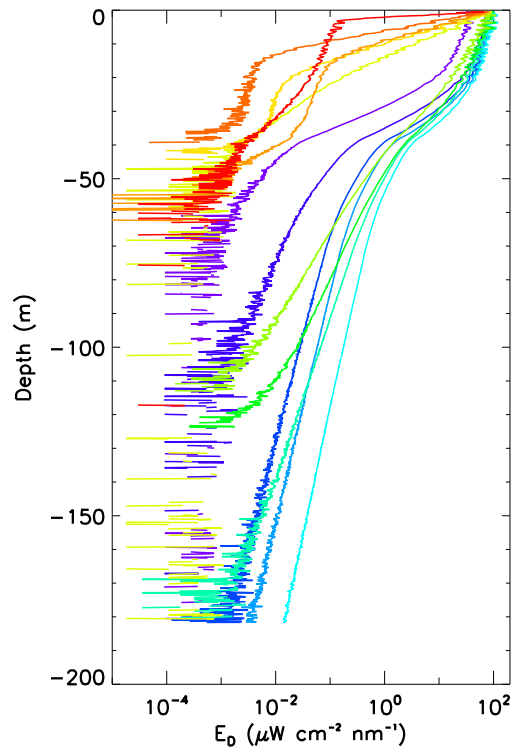
7:56 UTC



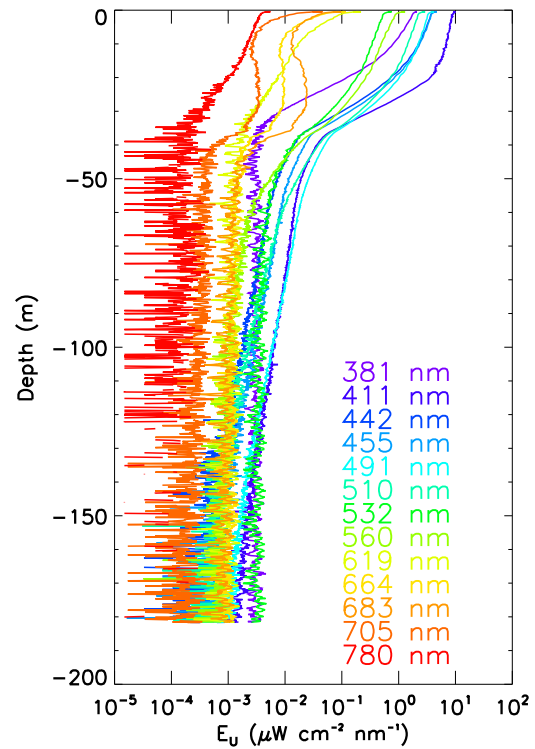
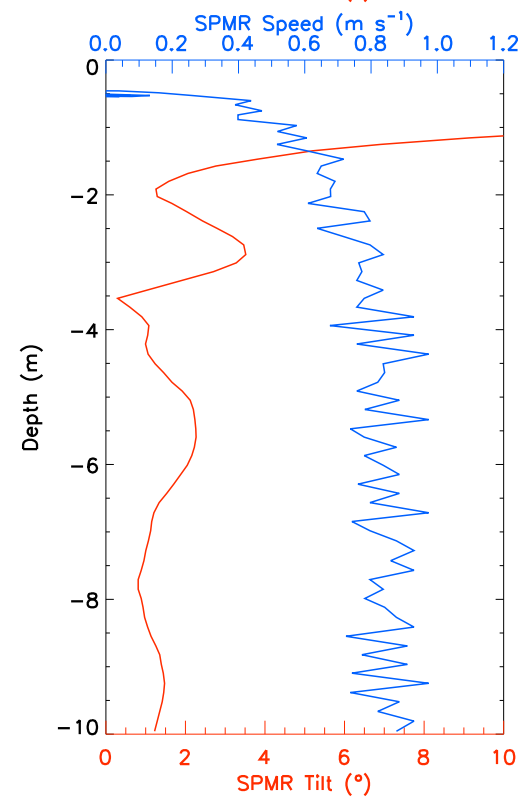
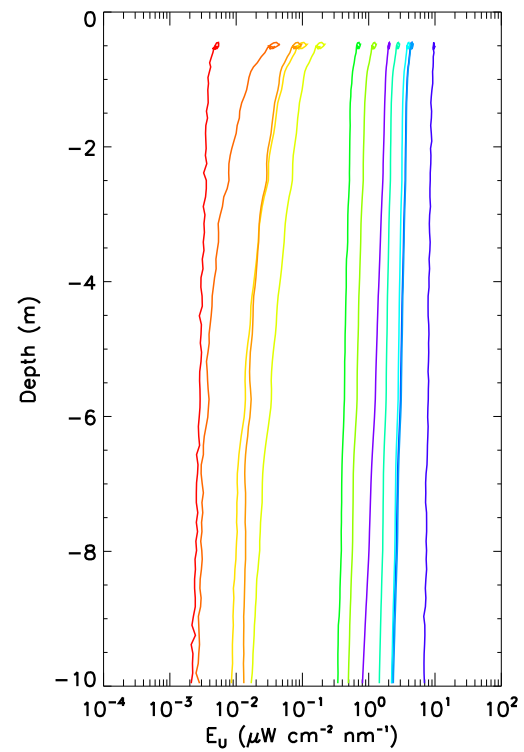
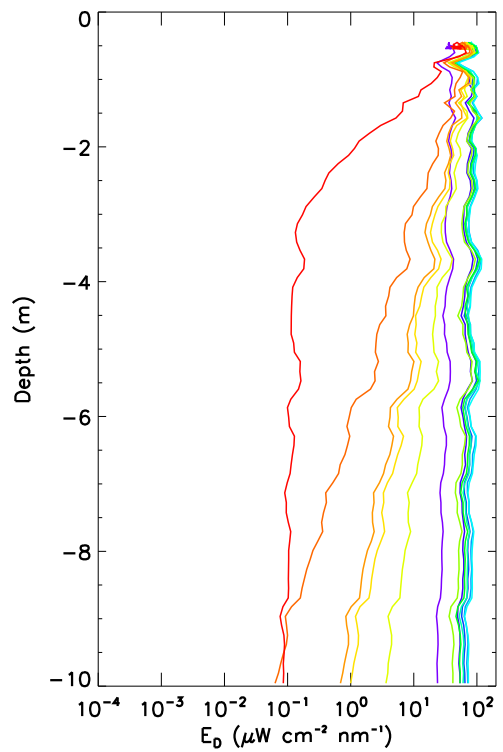
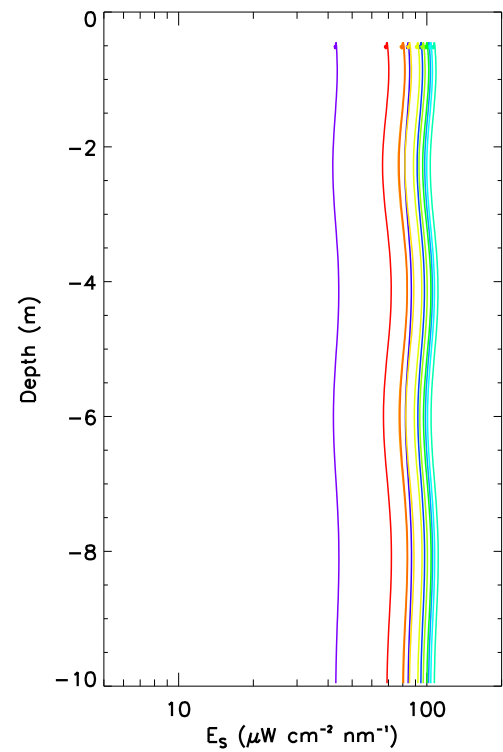
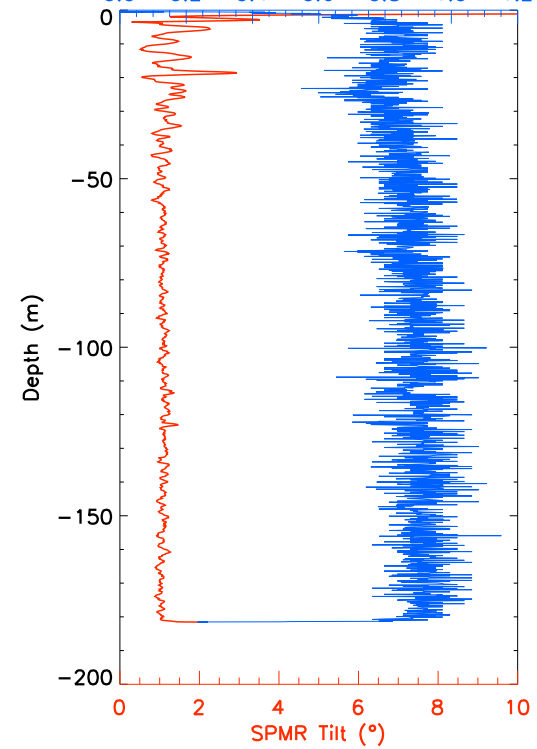
Boussole#88



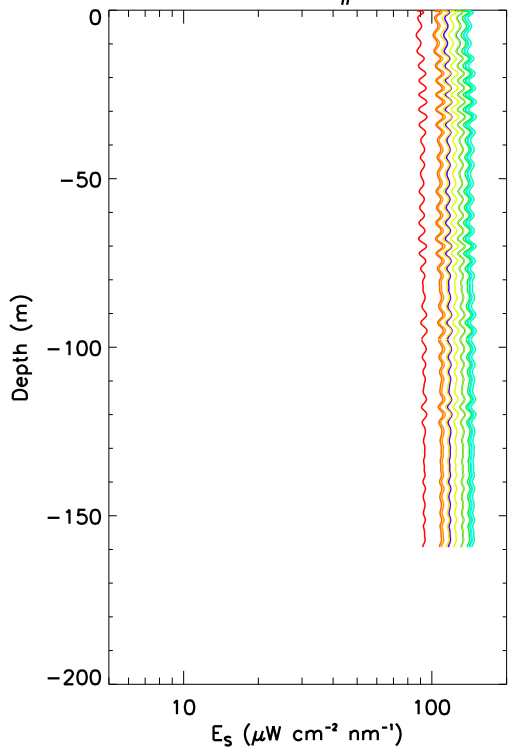
B88_Bou160609AC



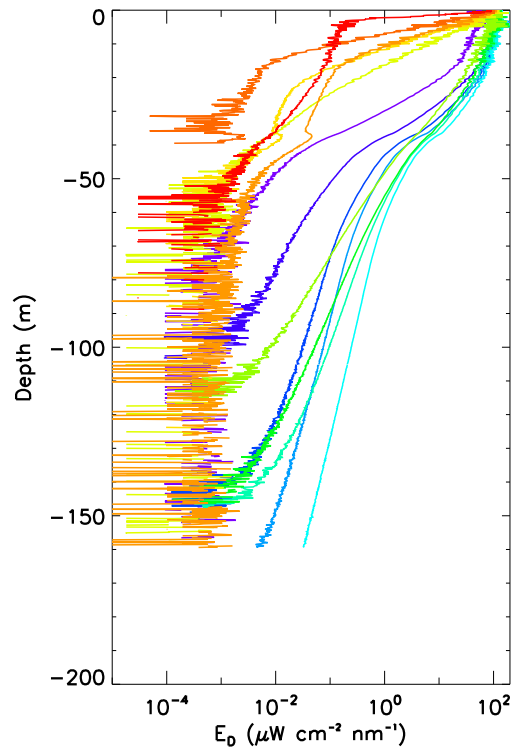
8:4 UTC

SPMR Speed (m s^{-1})

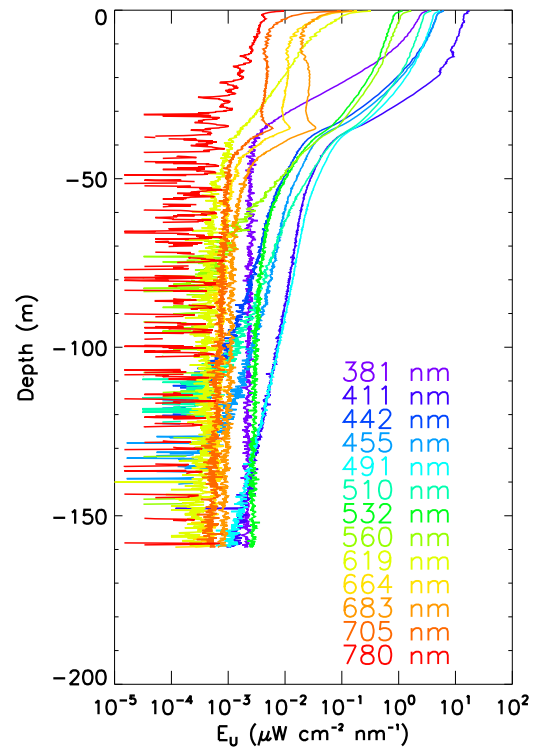
Boussole#88



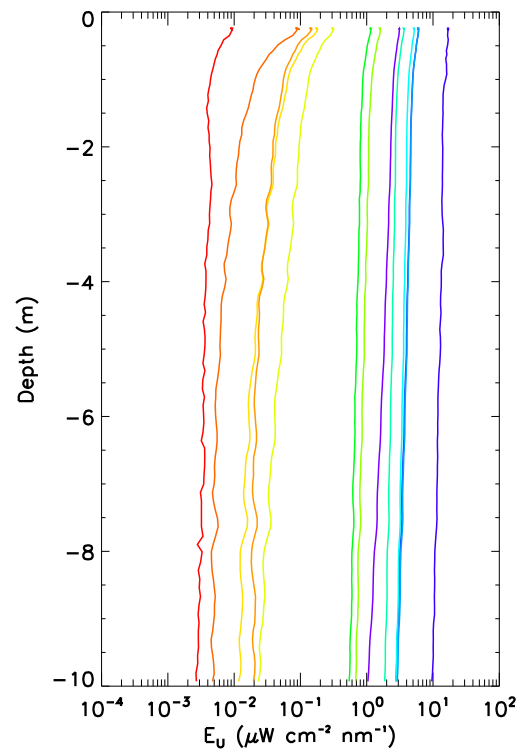
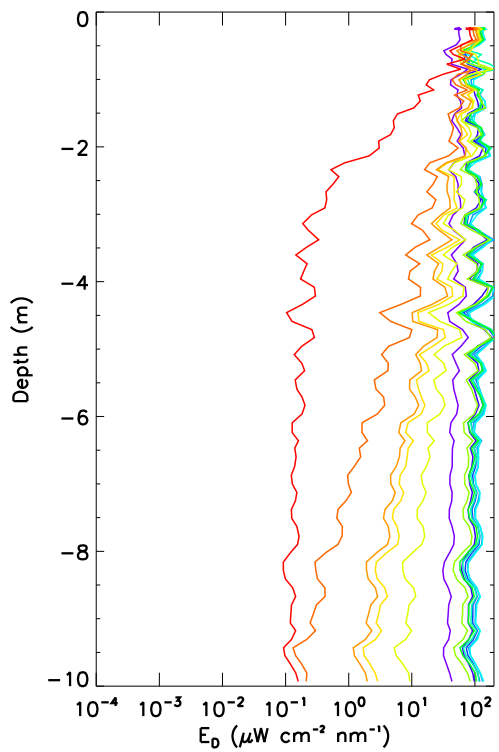
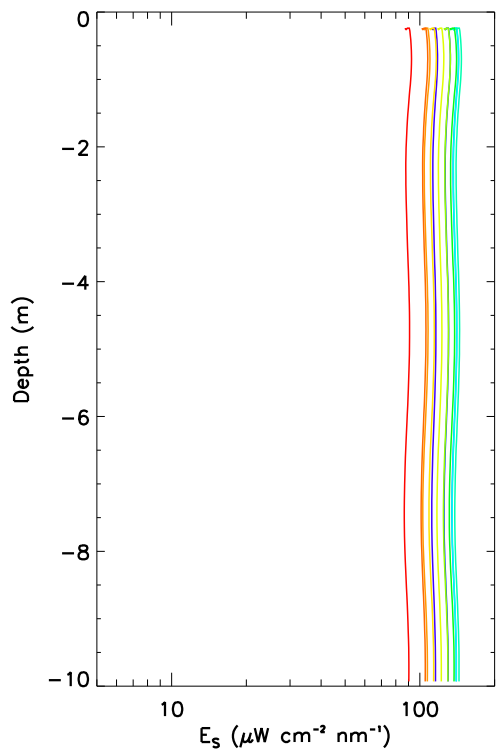
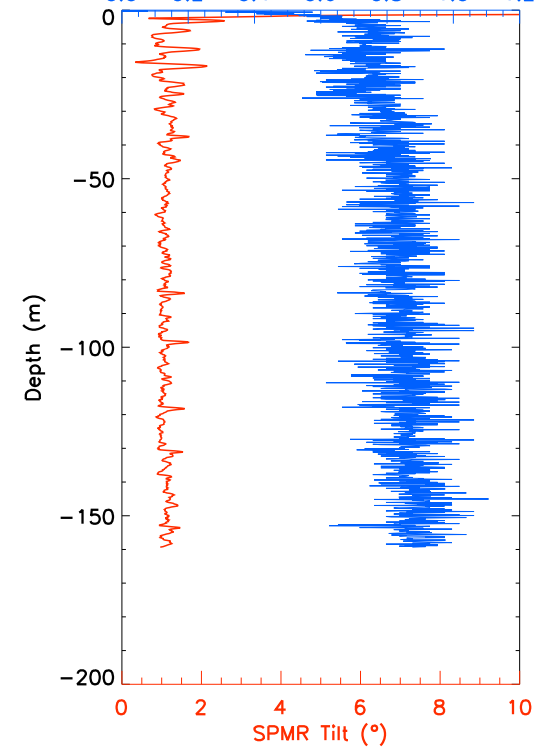
B88_Bou160609AD



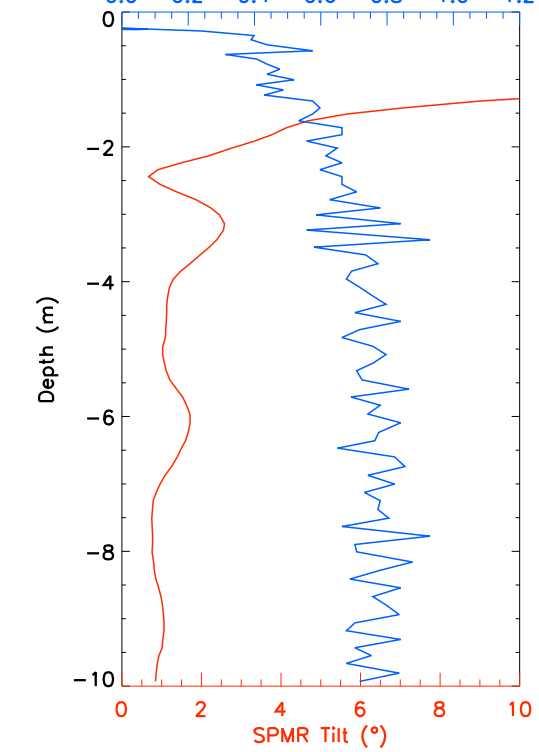
12:54 UTC

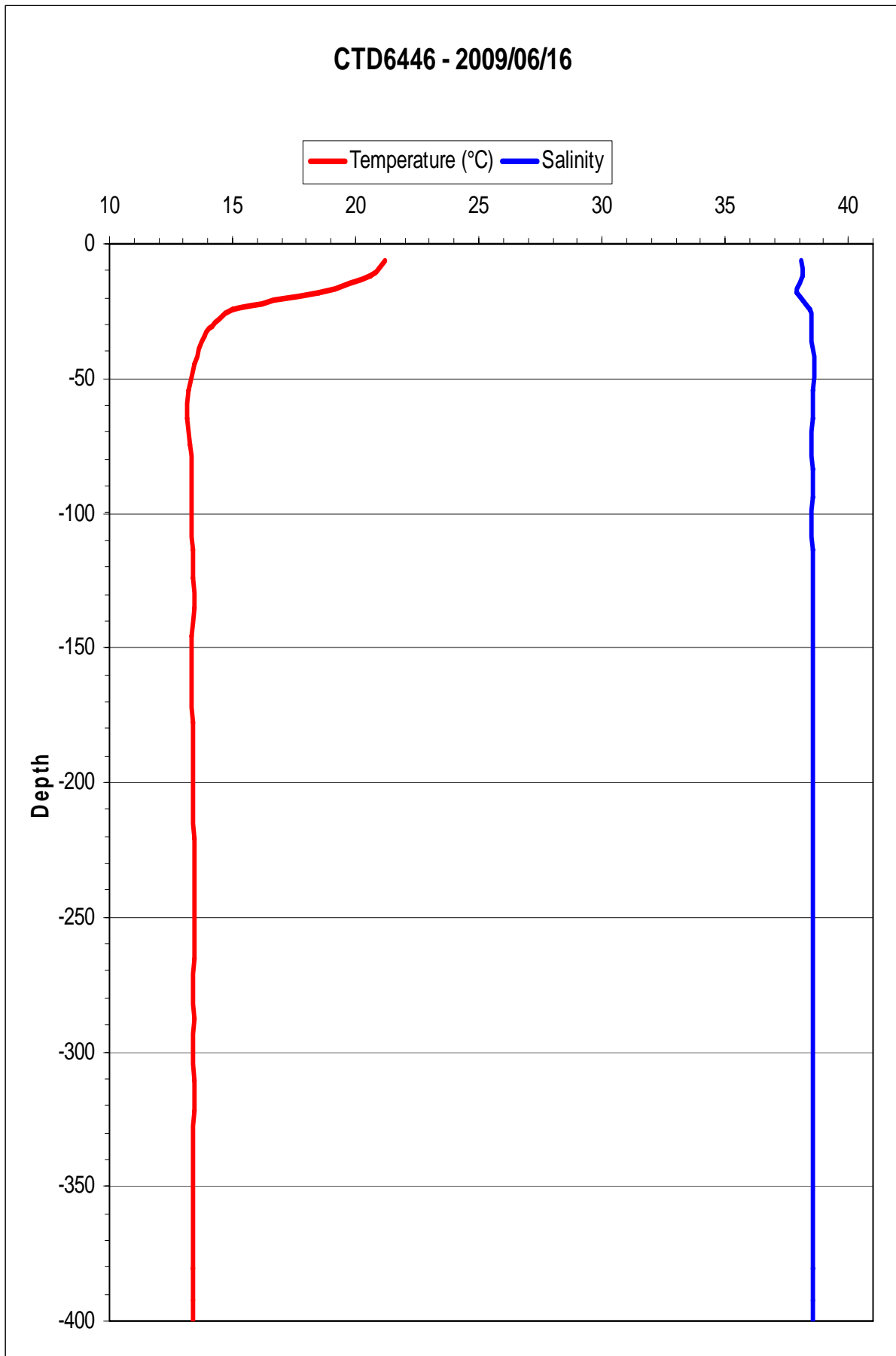


0.0 0.2 0.4 0.6 0.8 1.0 1.2



0.0 0.2 0.4 0.6 0.8 1.0 1.2

SPMR Tilt ($^\circ$)



Date: 16/06/2009
Start: 09:30 [UTC]

Latitude: 43°22.163'N
Longitude: 07°54.027'E

