FUMSECK cruise

SPASSO Images Analysis

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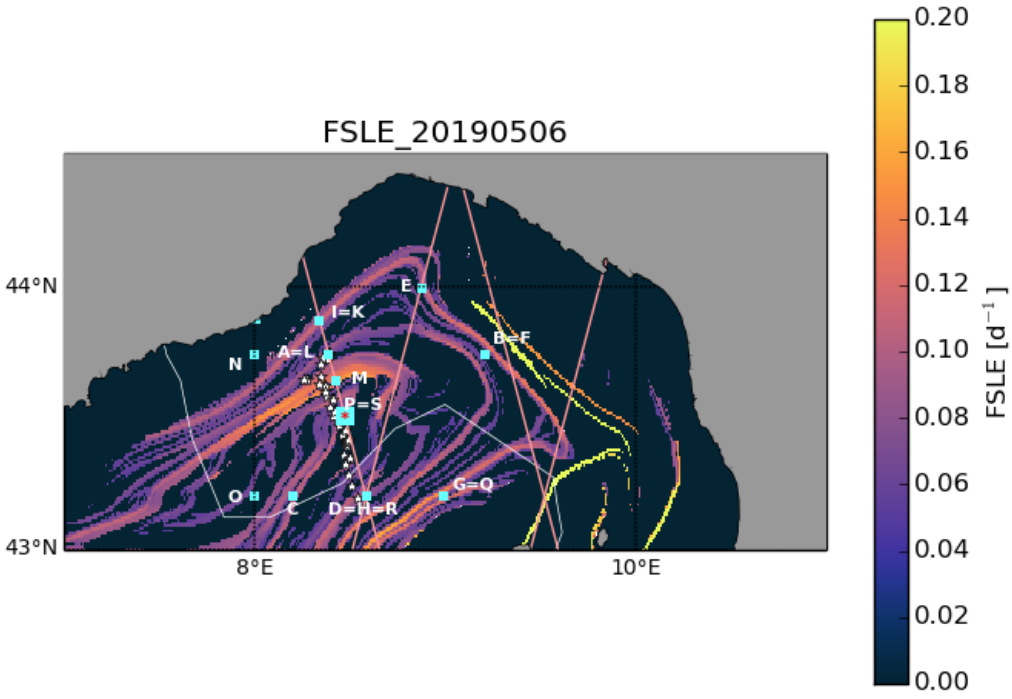
Executive Summary

To avoid the storm, the original plan (see Ongoing section) was modified. The bead experiment, originally scheduled for yesterday, is taking place right now on Monday May 6.

A day of preparation of the bead experiment was done yesterday in Villefranche Harbor to be sheltered from the storm.
Since transect N-O had not been done on Saturday, an equivalent of it (a southeastward transect west of the bead area) was done yesterday night in order to finish to obtain a complete zone for the omega-equation domain (useful to calculate vertical velocity).

Fingers are crossed for today: glider recovery, bead experiment and, hopefully, also some vertical speed stations. And all the best for the trip back.



1 Ongoing operations and upcoming stations

Plans of yesterday and today have been changed because of the meteorological conditions.

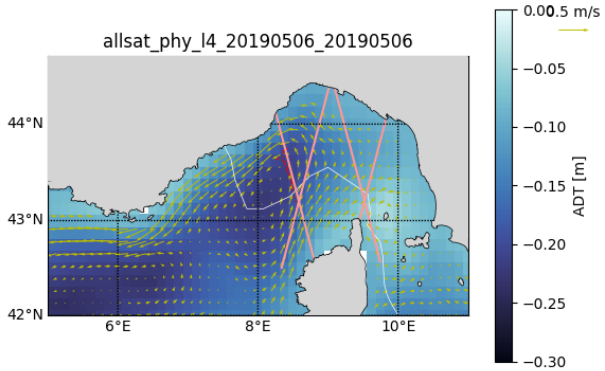
A day of preparation of the bead experiment was done yesterday in Villefranche Harbor to be sheltered from the storm. The buoys were weighed and ballasted and a general repetition of the bead experiment was done in real conditions (but without putting the beads and the dye).

Since transect N-O had not been done on Saturday, an equivalent of it (a southeastward transect west of the bead area) was done yesterday night in order to finish to obtain a complete zone for the omega-equation domain (useful to calculate vertical velocity).

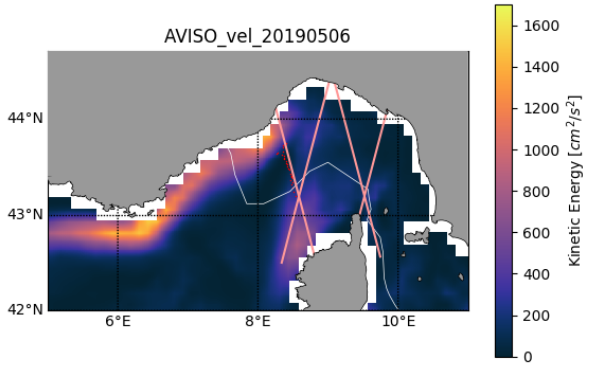
The Téthys II is close to the glider but the wave height prevents its recovery for the moment. Hence, in the meantime, the bead experiment is taking place. Once the glider recovered, there may be some time for a few vertical speed stations before heading back to La Seyne sur Mer as FUMSECK ends tomorrow.

2 Daily figures analysis

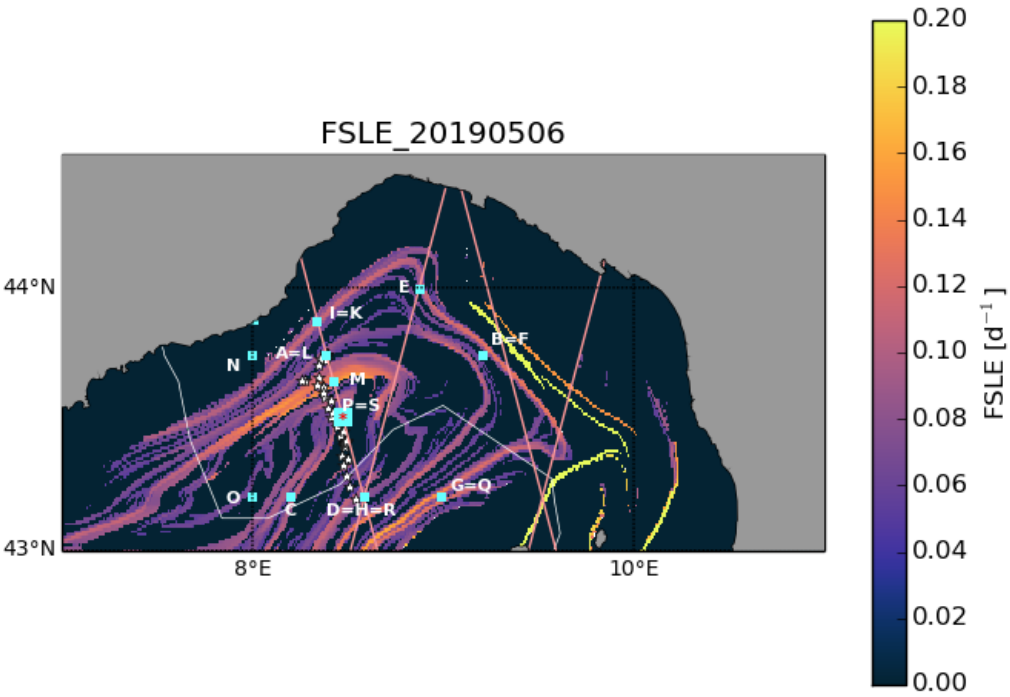
2.1 Altimetry, derived currents and Lagrangian analysis



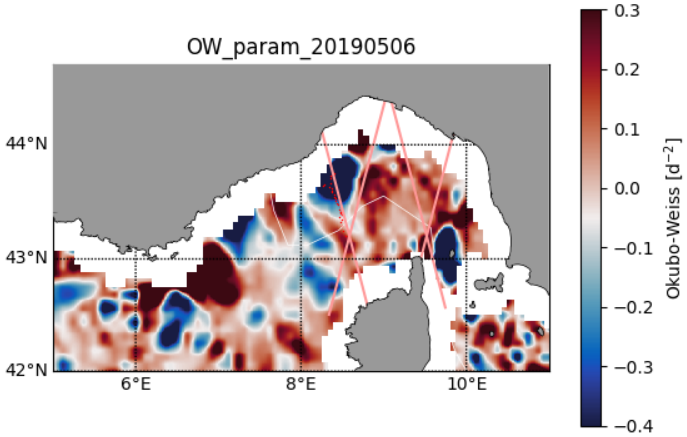
We observe a general cyclonic circulation in the region of interest.



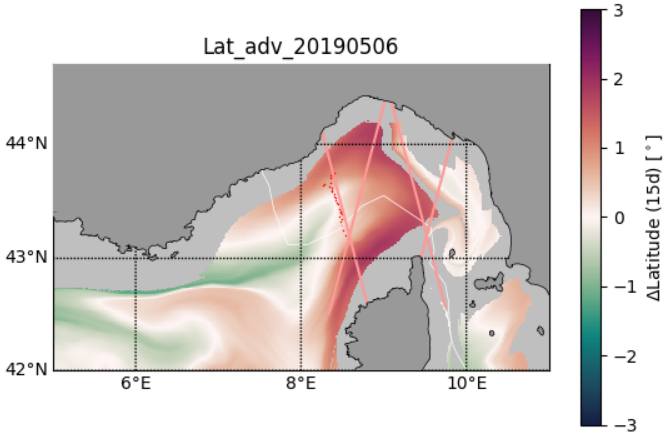
The area has low energy, apart in the cyclonic loop and, especially, along the Northern Current trajectory.

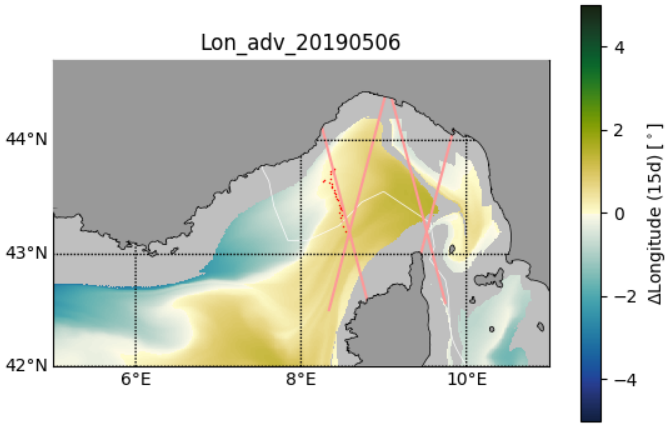


Reminder of the convention: we have called FSLE1 the FSLE structure looping cyclonically between 8°E and 9°E, and FSLE2 the structure East of the cyclonic loop, between 9°E and 10°E, 43°N and 44°N. Note that FSLE2 is now higher than FSLE1.



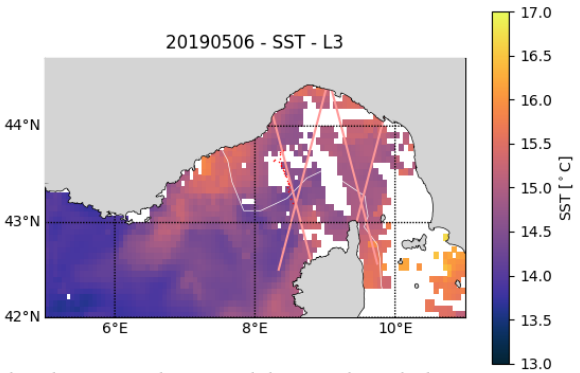
The OW Near Real Time (NRT) data look now perfectly fine.





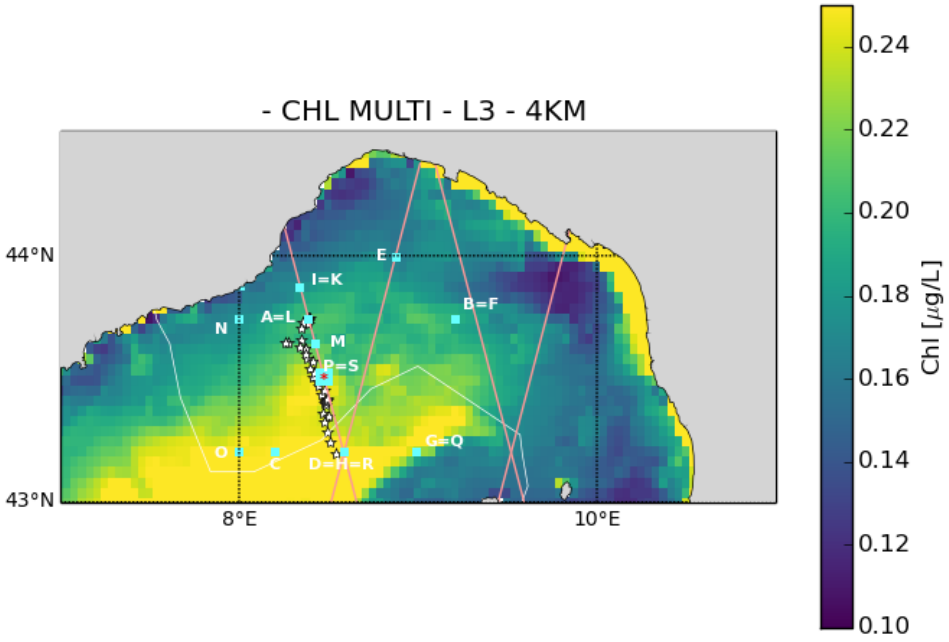
Note the tilting of the FSLE2 structure that is not parallel to the satellite track anymore, but tilted more Southeast to Northwest, with a bend at its northern end.
Reminder: In the Lat_adv, the red goes North while the green goes south; in the Long_adv, the green goes east, the blue goes west).

2.2 SST analysis



Some clouds are coming back since the wind has calmed down.

2.3 Chlorophyll analysis



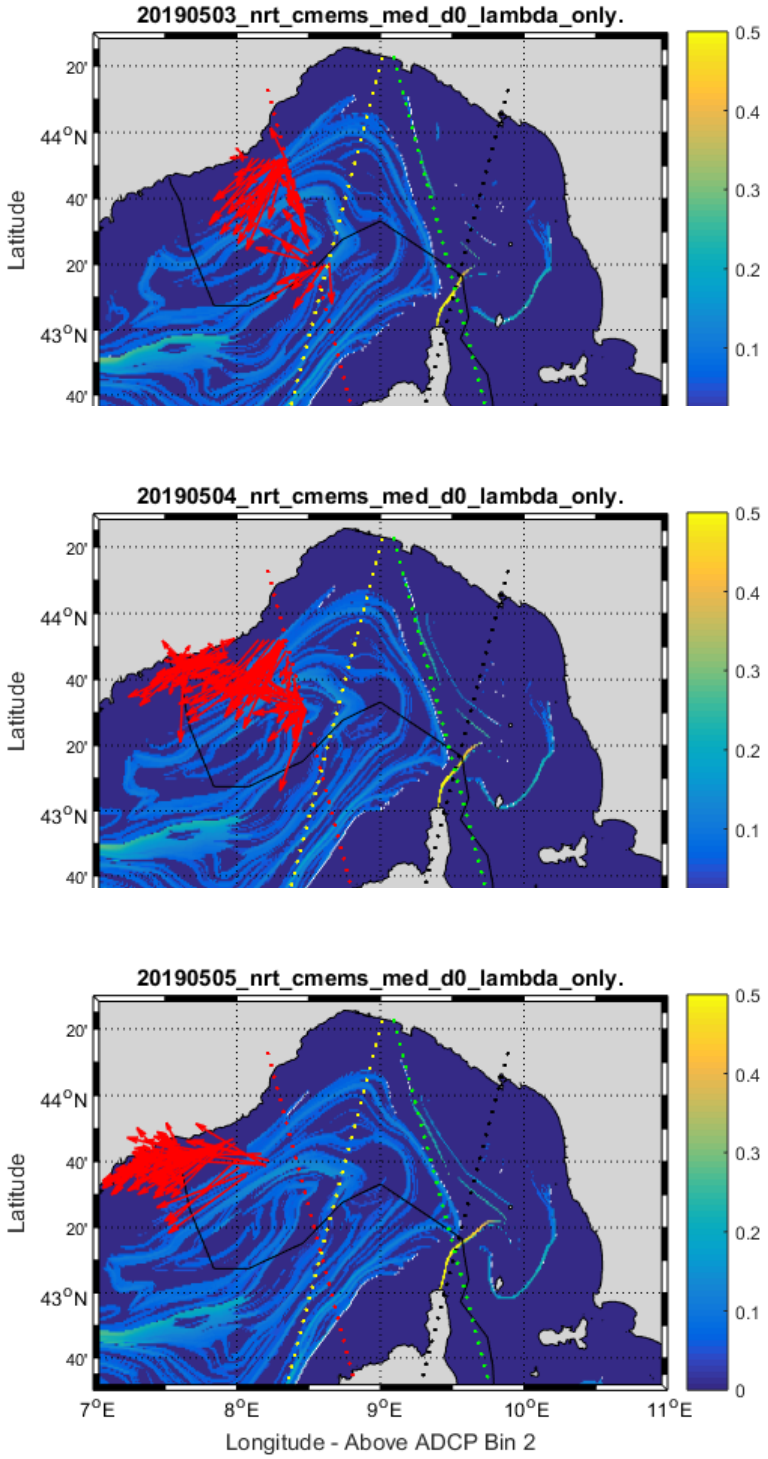
Note the change of scale in the Chl data. Before the scale was between 0.1 and 0.4, now it is between 0.1 and 0.25 mg/m3.

2.4 Glider

The Téthys II is close to the glider but the wave height prevents its recovery for the moment.

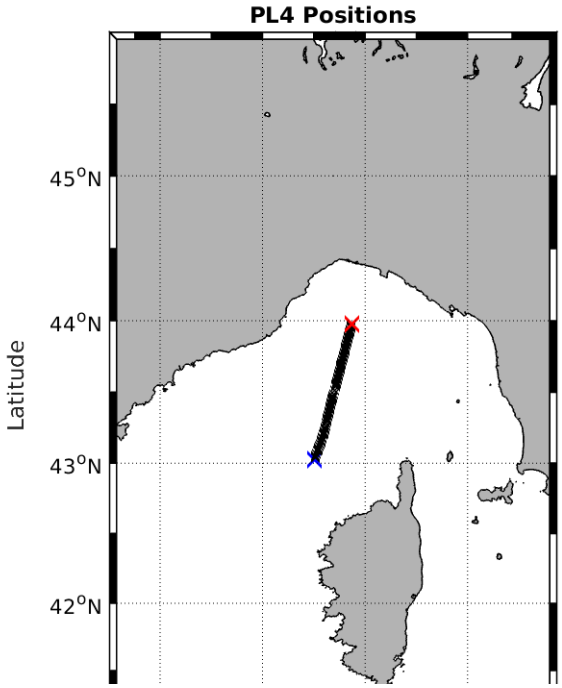
2.5 Hull-mounted ADCP

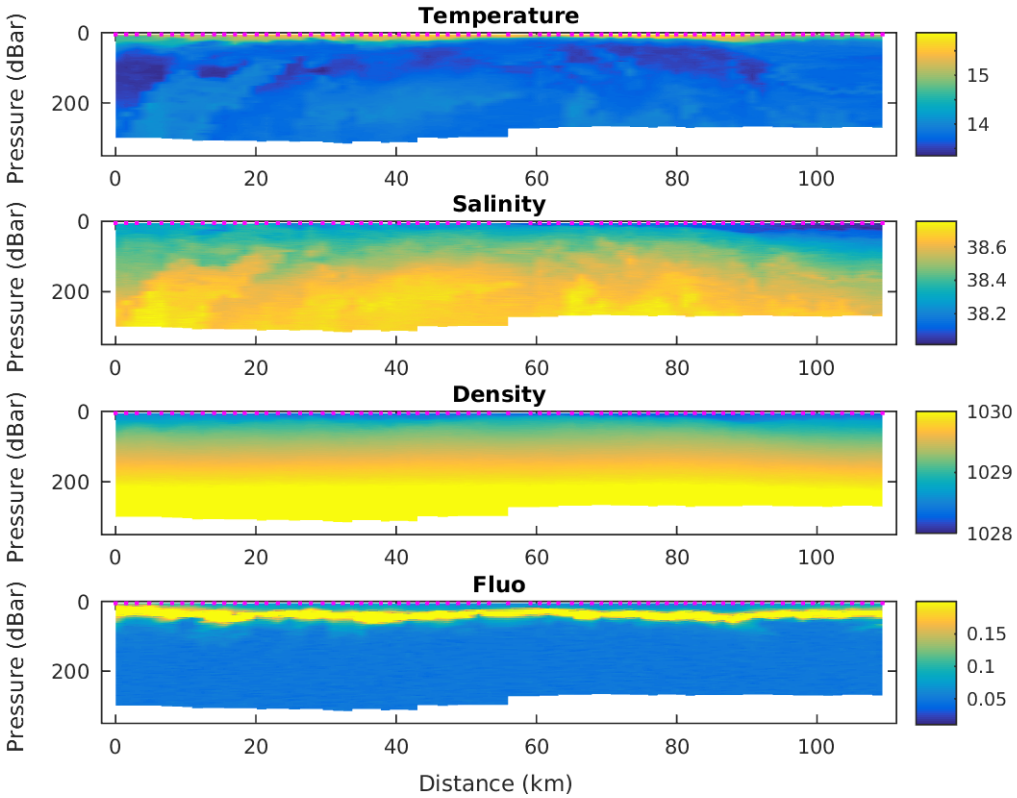
Here are three pictures of ADCP horizontal currents along the track of the Téthys II during May 3rd, 4th and 5th at 27m depth, superimposed on the corresponding FSLE.

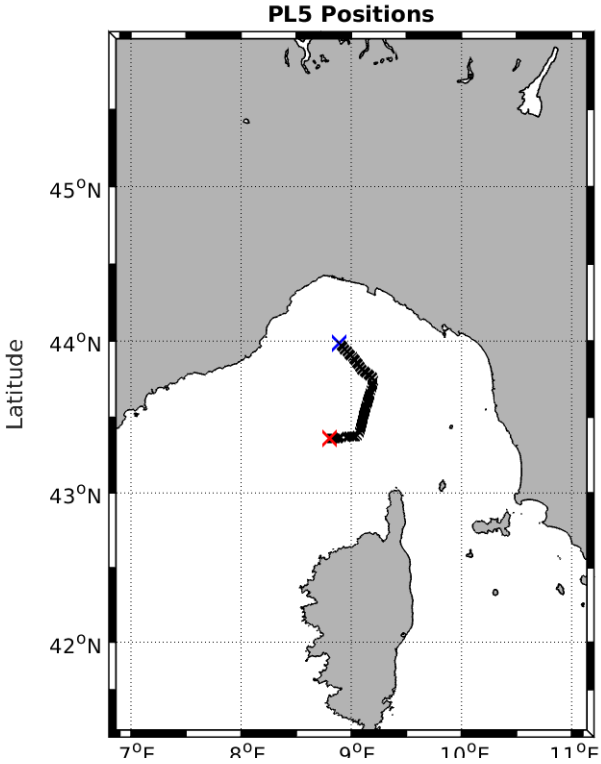

20190503_nrt_cmems_med_d0_lambda_only.
20190504_nrt_cmems_med_d0_lambda_only.
20190505_nrt_cmems_med_d0_lambda_only.
Latitude
Longitude - Above ADCP Bin 2
20'
44°N
40'
20'
43°N
40'
7°E
8°E
9°E
10°E
11°E
0.5
0.4
0.3
0.2
0.1
0

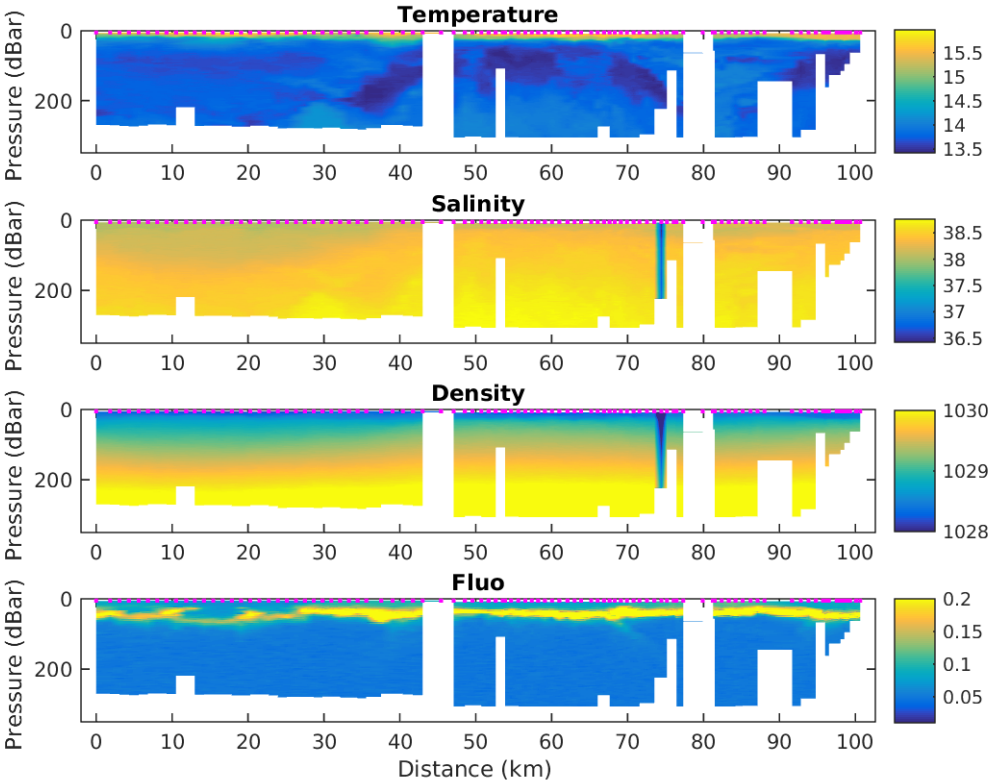
2.6 MVP

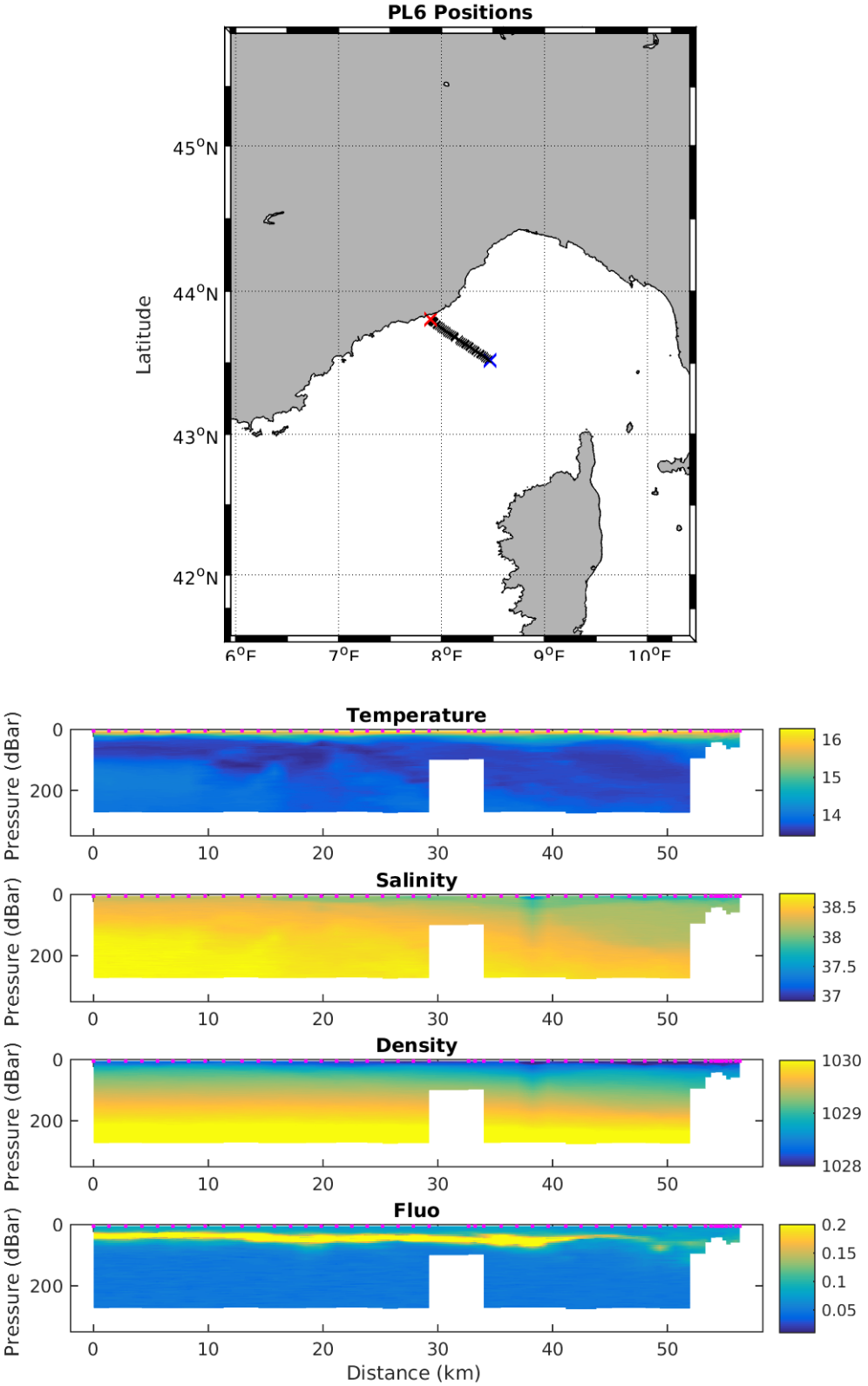
Here are figures of the 4th, 5th and 6th MVP transects (two figures each: the map of the transect route and the vertical transect). Some salinity corrections need to be done. The blue dot is the start, the red one the final point.






PL5 Positions
45°N
44°N
43°N
42°N
Latitude
7°E
8°E
9°E
10°E
11°E


Temperature
Salinity
Density
Fluo
Pressure (dBar)
0
200
0
10
20
30
40
50
60
70
80
90
100
Distance (km)
15.5
15
14.5
14
13.5
38.5
38
37.5
37
36.5
1030
1029
1028
0.2
0.15
0.1
0.05



We can observe the nice signature of the Northern Current when crossed from offshore toward the coast.

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Acknowledgements

The FUMSECK cruise is part of the BIOSWOT program.
The calculated hull-mounted ADCP currents are processed by Celine Heyndrickx, La Seyne sur Mer.
The altimetry data are the AVISO Mediterranean regional product:
http://www.aviso.altimetry.fr/index.php?id=1275.
The derived currents are processed by SPASSO to derive Eulerian and Lagrangian diagnostics of ocean circulation: OkuboWeiss parameter, particle retention time and advection, Lagrangian Coherent Structures. Sea surface temperature (level 3 and 4, 1 km resolution) and chlorophyll concentration (level 3, 1km resolution, MODISAqua and NPPVIIRS sensors combined (after May 27, 2017) into a new product called MULTI) have been provided by CMEMS Copernicus Marine Environment Monitoring Service (http://marine.copernicus.eu). Another SST product (level 4, composite, 1 km resolution) is provided by the Jet Propulsion Laboratory (JPL), Pasadena, CA.

Useful links:

FUMSECK is a cruise from the BIOSWOT project

SPASSO FUMSECK webpages