[BIOSWOT-Med]: SPASSO Images Analysis

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March 17, 2023

****
Executive Summary

Type here your executive summary
****

1 Ongoing operations and upcoming stations

SWOT passing time (UTC) over:

43°N - 5°E Asc	42.7°N - 4.8°E Asc
2023-03-17 02:14:37	2023-03-17 02:14:37
2023-03-18 02:05:15	2023-03-18 02:05:15
2023-03-19 01:55:52	2023-03-19 01:55:52
2023-03-20 01:46:30	2023-03-20 01:46:30
2023-03-21 01:37:07	2023-03-21 01:37:07

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2 Daily figures analysis

2.1 Altimetry, derived currents

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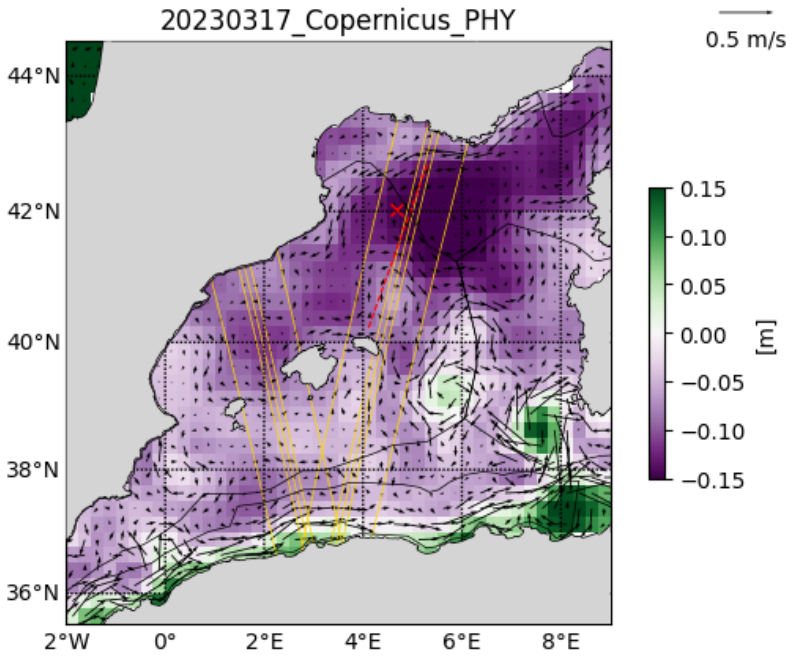

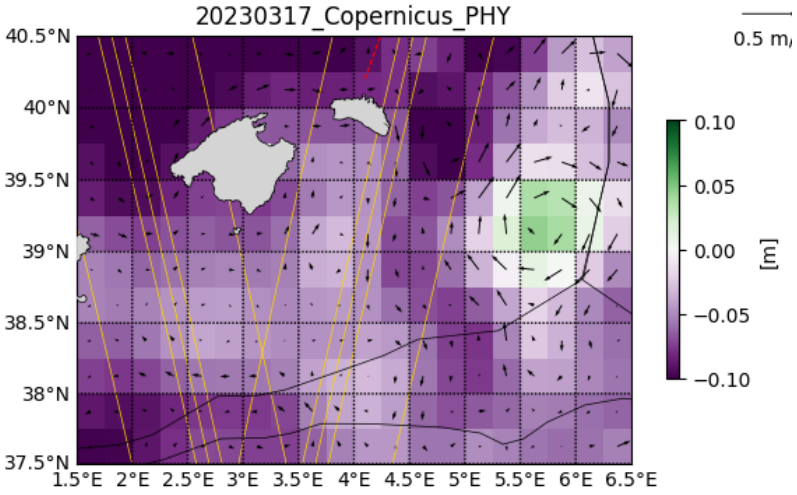

2.2 SST analysis

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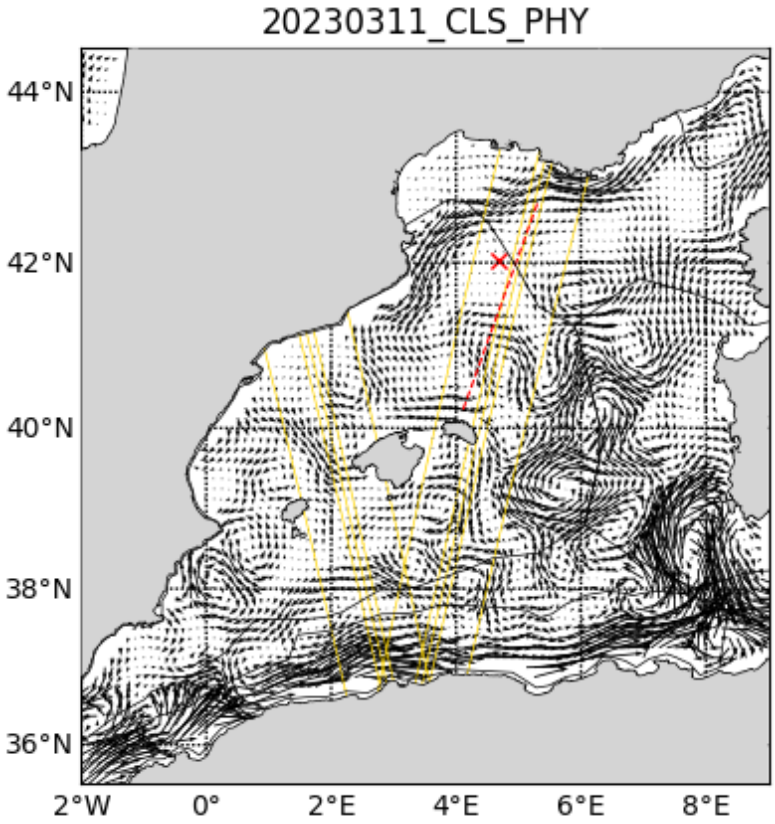

2.3 Chlorophyll analysis

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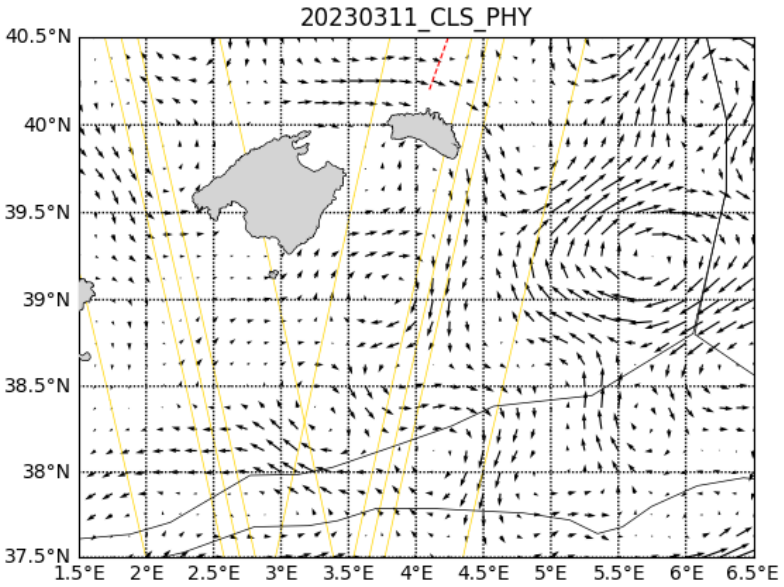
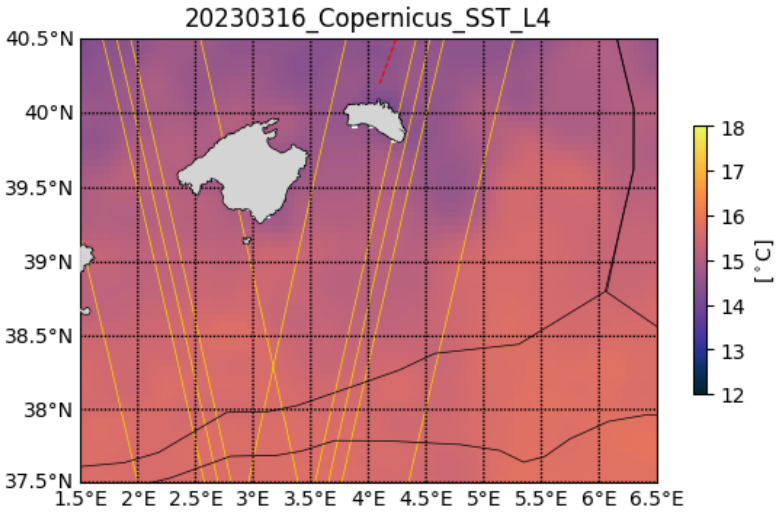
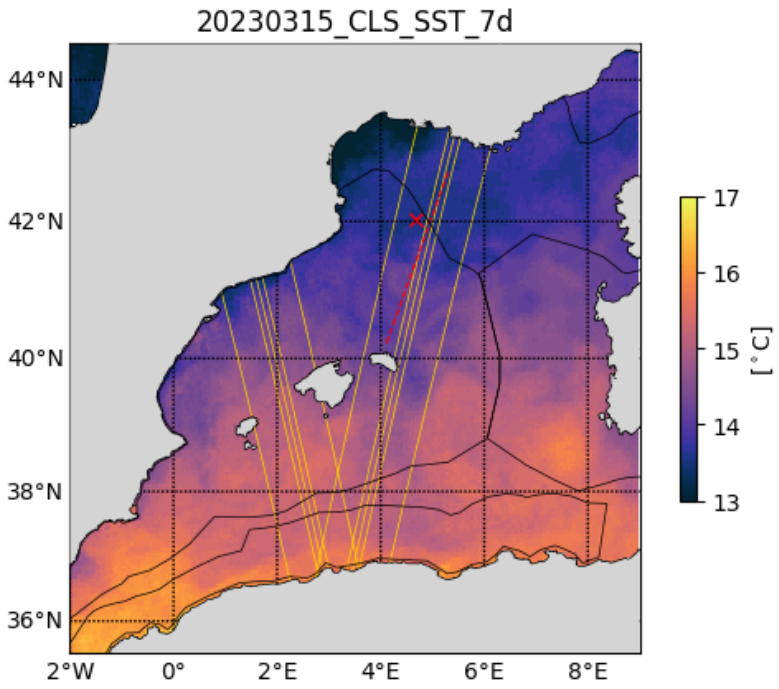




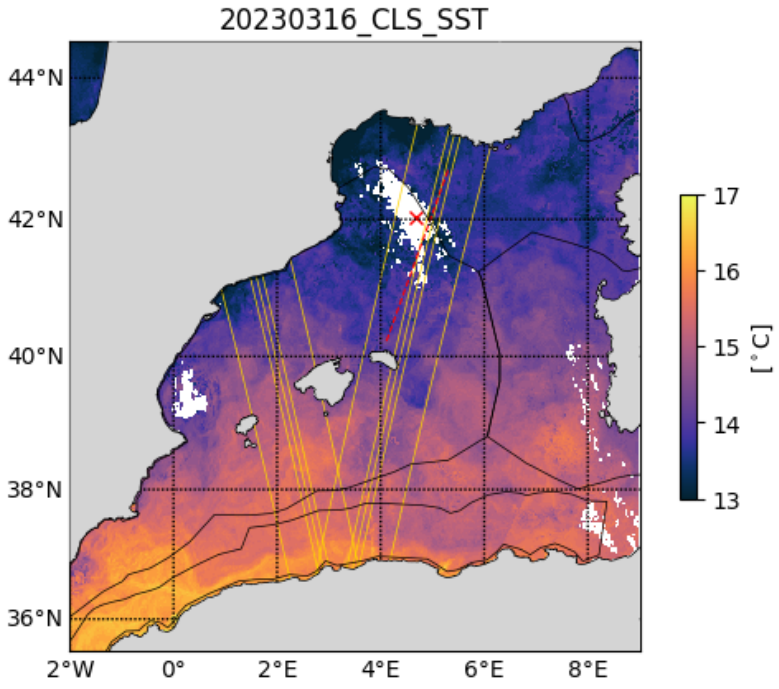
2.4 Eulerian/Lagrangian analysis

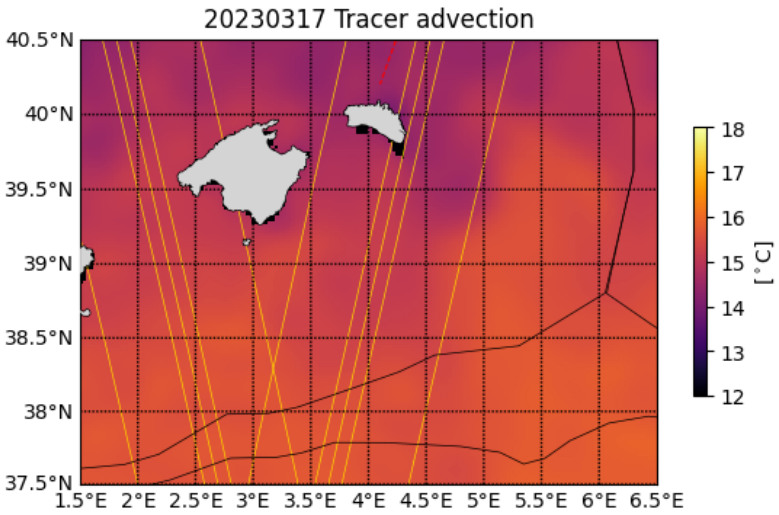
Eulerian diagnostics computed with Copernicus_PHY velocities:
KE: kinetic energy
OW: Okubo-Weiss parameter

Lagrangian diagnostics computed by seeding Lagrangian particles every 0.02deg and advected for 30 days backward in time with Copernicus_PHY velocities:



FTLE: finite time Lyapunov exponents (convergent fronts detection)
LLADV: longitude and latitude advection
Retention parameter (based on computing the okubo Weiss parameter along a particle trajectory): Detect trapping structures (colorbar = days water parcels have a positive vorticity)





2.5 Other analysis

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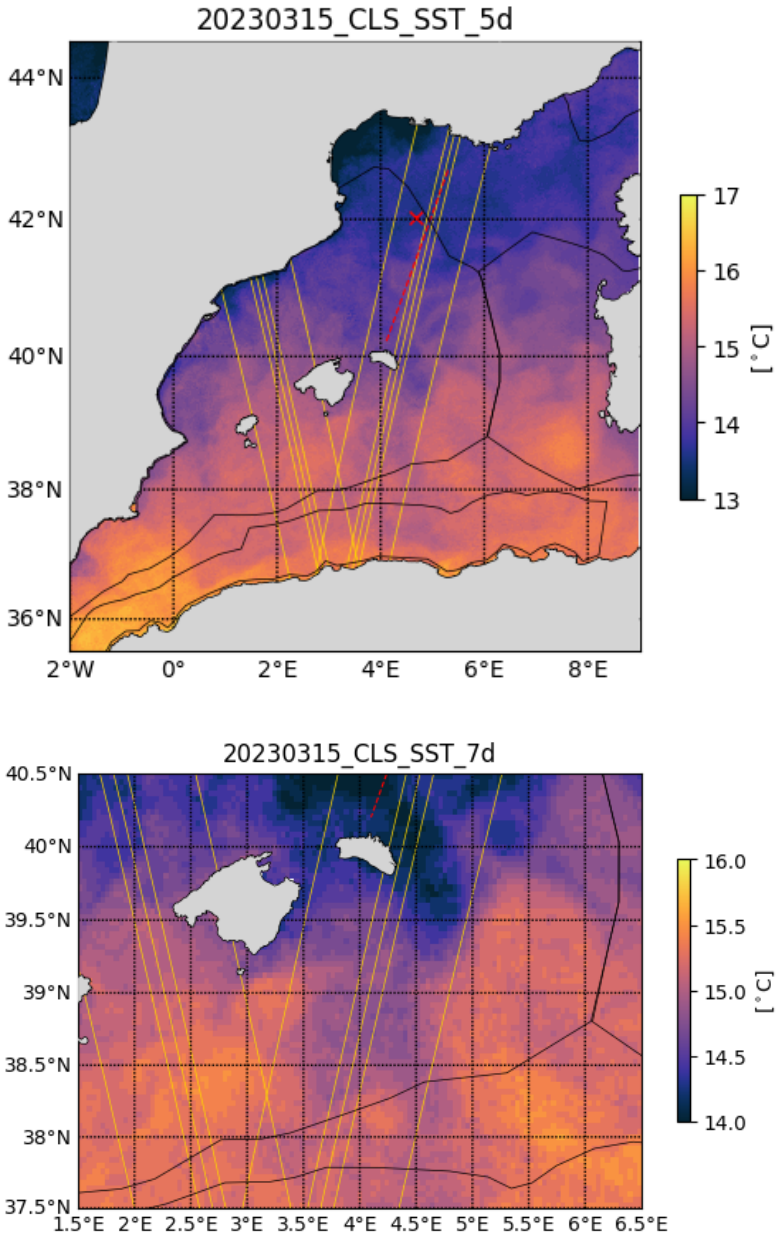
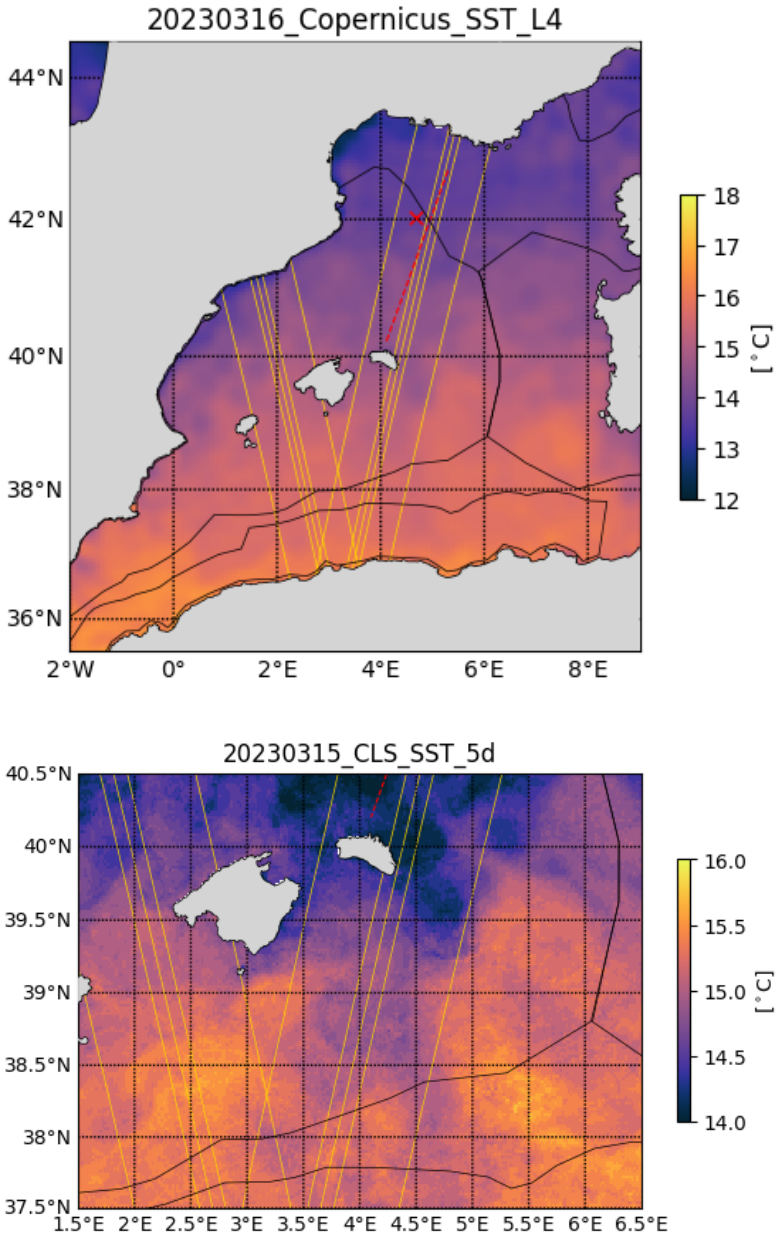
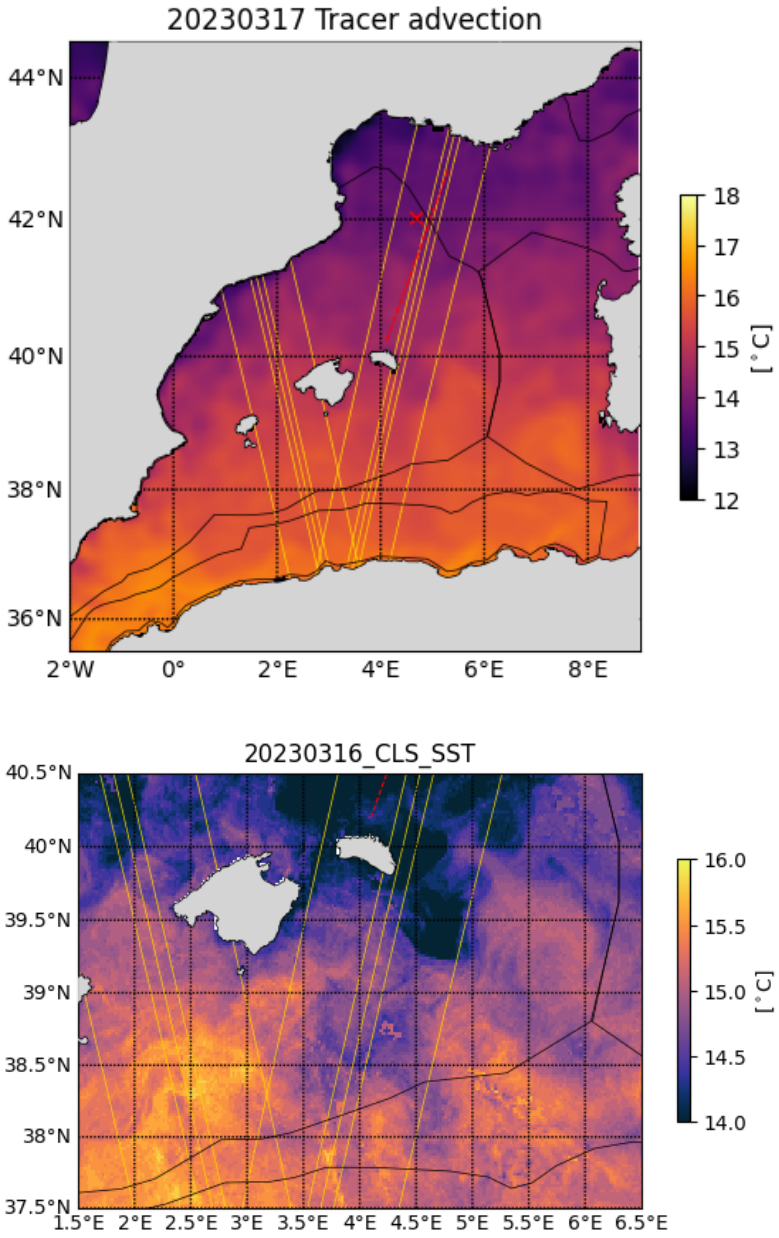
Acknowledgments



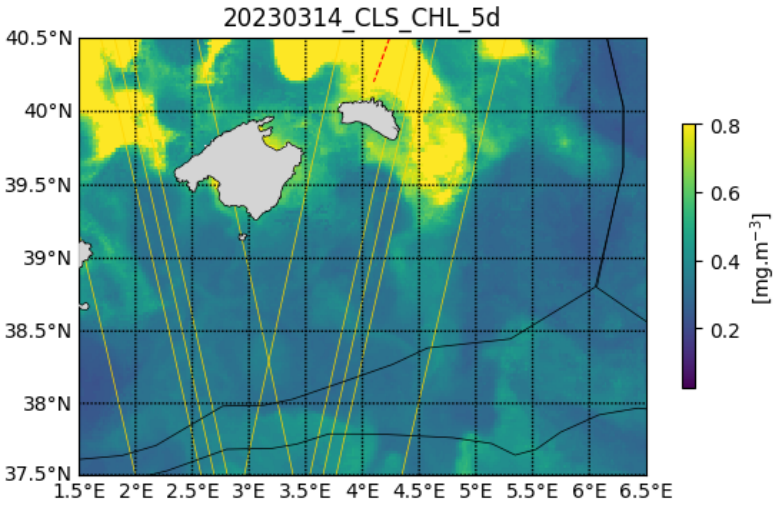
Example:
The altimetry data are the AVISO Mediterranean regional product: http://www.aviso.altimetry.fr/index.php?id
The derived currents are processed by SPASSO to derive Eulerian and Lagrangian diagnostics of ocean circulation: OkuboWeiss parameter, particle re-

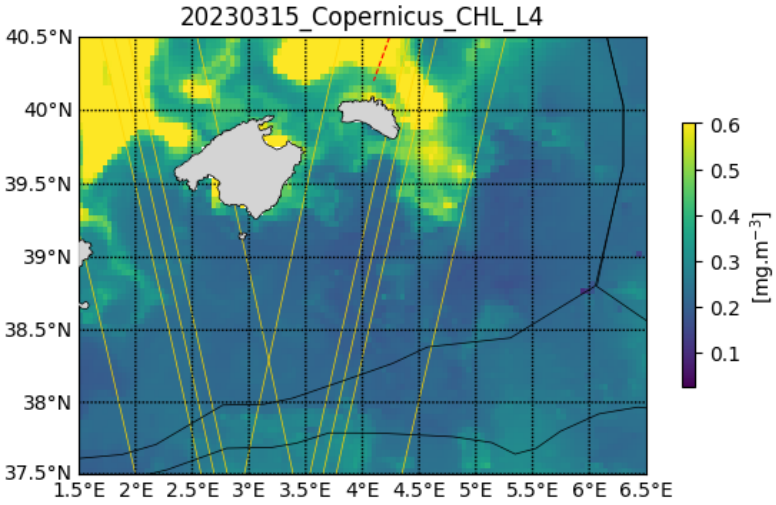


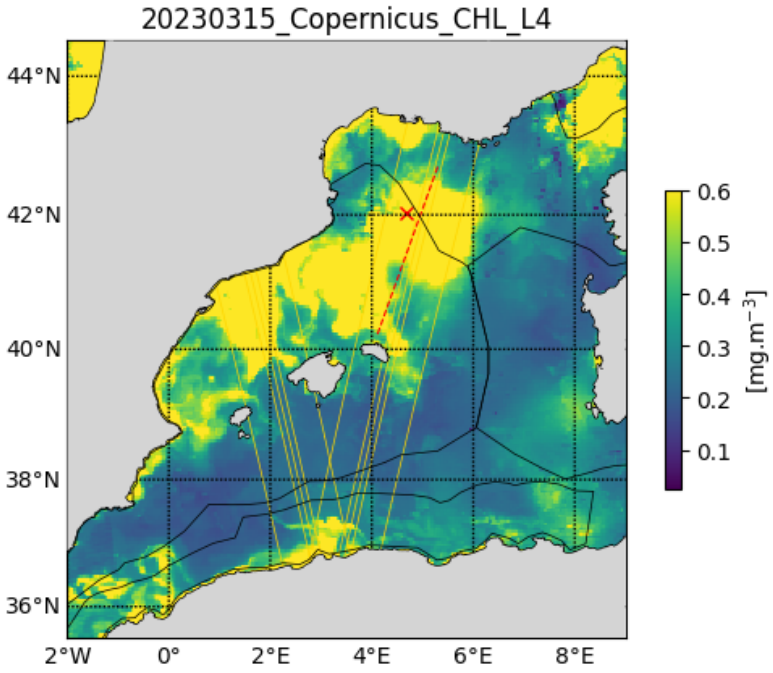
tention time and advection, Lagrangian Coherent Structures. CLS provided the SST and surface CHL concentration composite products. Sea surface temperature (level 3 and 4, 1 km resolution) and chlorophyll concentration (level 3, 1km resolution, MODISAqua and NPPVIIRS sensors combined (after May 27, 2017)

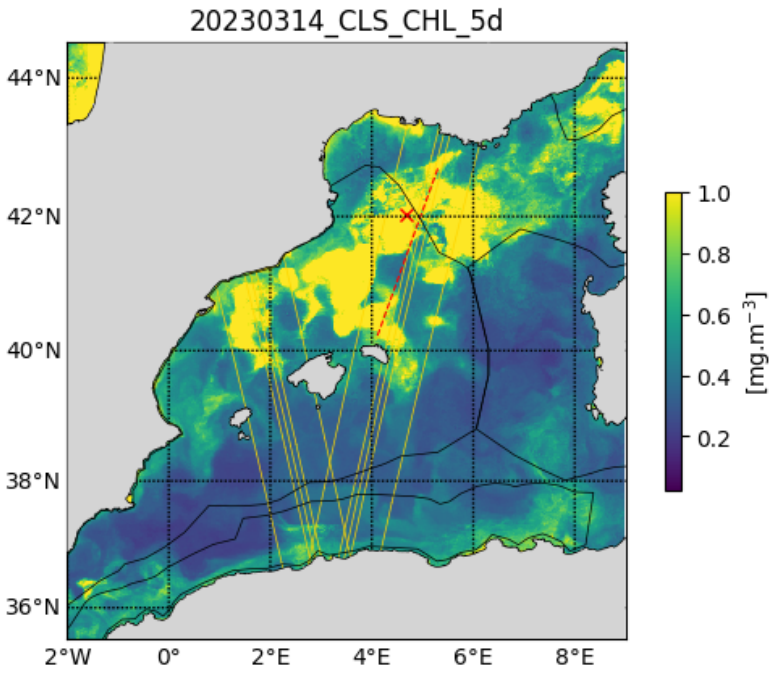


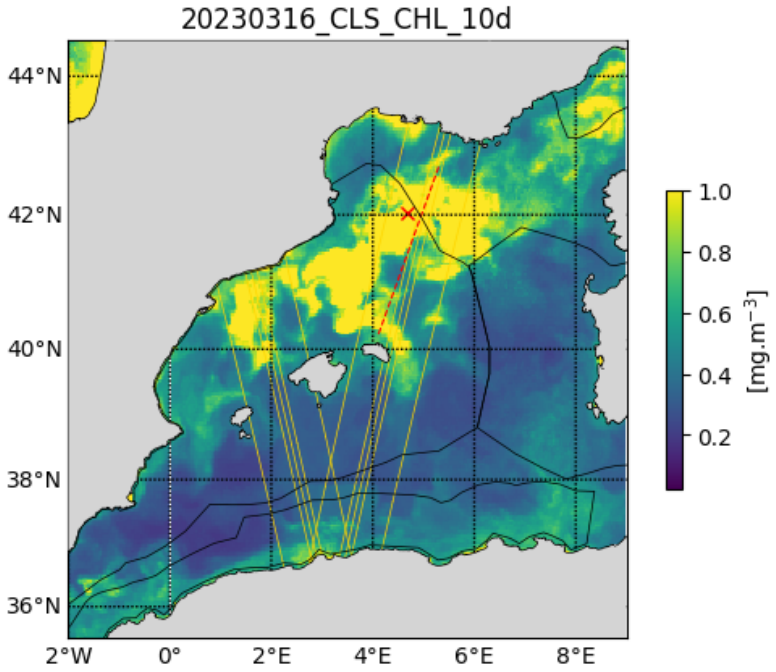
into a new product called MULTI) have been provided by CMEMS Copernicus Marine Environment Monitoring Service (http://marine.copernicus.eu). Another SST product (level 4, composite, 1 km resolution) is provided by the Jet Propulsion Laboratory (JPL), Pasadena, CA.

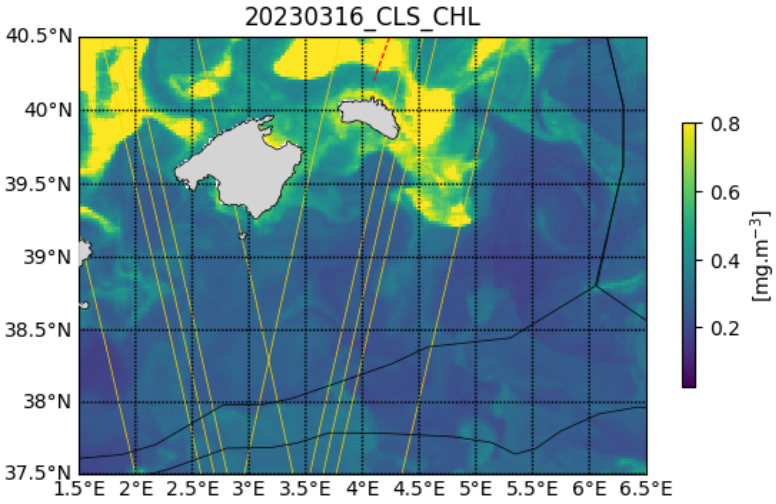

20230314_CLS_CHL_5d
40.5°N
40°N
39.5°N
39°N
38.5°N
38°N
37.5°N
1.5°E 2°E 2.5°E 3°E 3.5°E 4°E 4.5°E 5°E 5.5°E 6°E 6.5°E
0.8
0.6
0.4
0.2
[mg.m^{-3}]

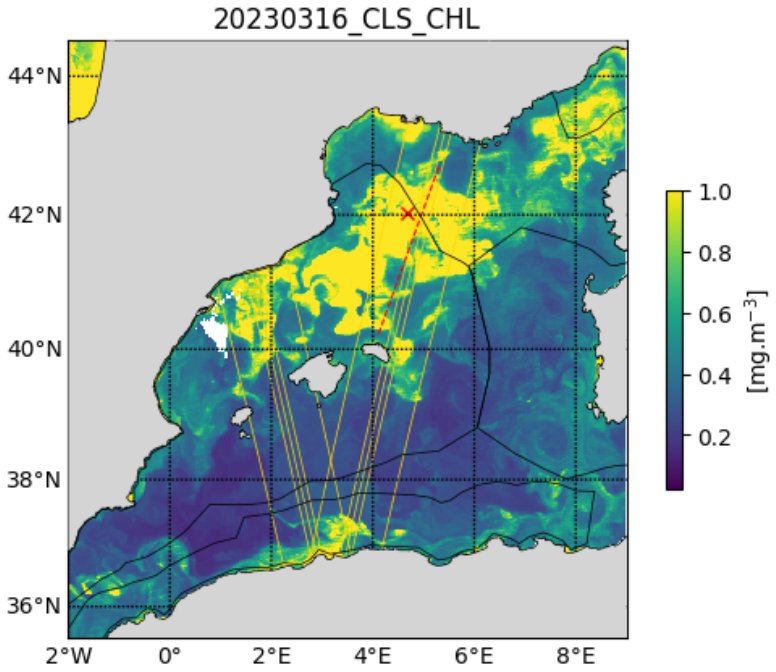

20230315_Copernicus_CHL_L4
40.5°N
40°N
39.5°N
39°N
38.5°N
38°N
37.5°N
1.5°E 2°E 2.5°E 3°E 3.5°E 4°E 4.5°E 5°E 5.5°E 6°E 6.5°E
0.6
0.5
0.4
0.3
0.2
0.1
[mg.m^{-3}]

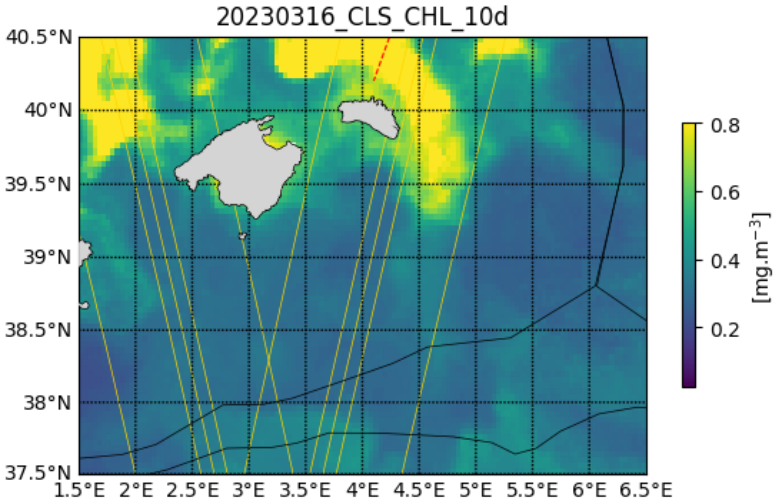

20230315_Copernicus_CHL_L4
44°N
42°N
40°N
38°N
36°N
2°W
0°
2°E
4°E
6°E
8°E
0.6
0.5
0.4
0.3
0.2
0.1
[mg.m⁻³]

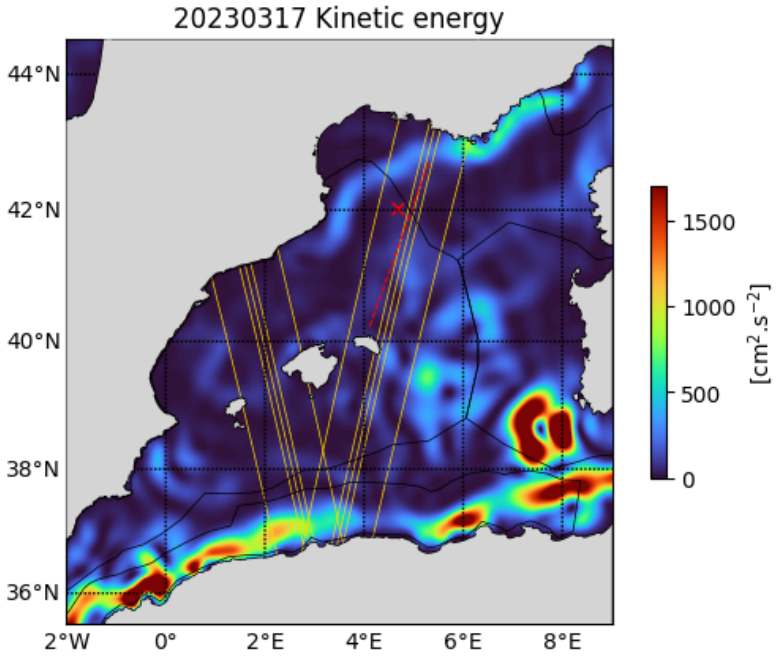

20230314_CLS_CHL_5d
44°N
42°N
40°N
38°N
36°N
2°W
0°
2°E
4°E
6°E
8°E
1.0
0.8
0.6
0.4
0.2
[mg.m⁻³]

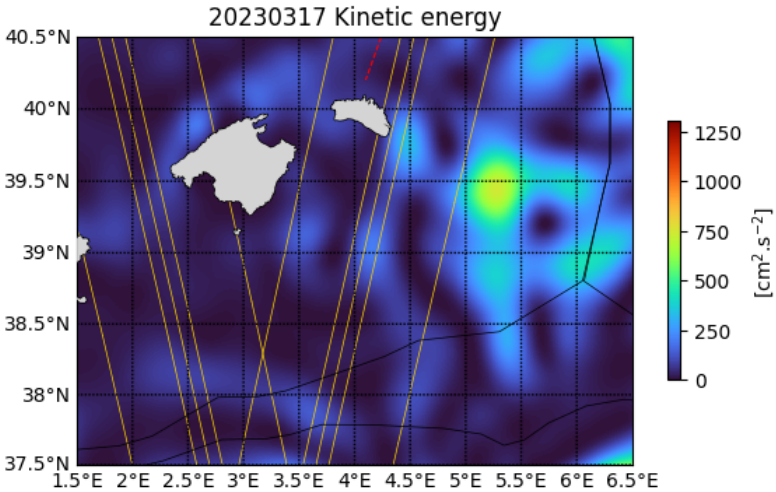

20230316_CLS_CHL_10d
44°N
42°N
40°N
38°N
36°N
2°W
0°
2°E
4°E
6°E
8°E
1.0
0.8
0.6
0.4
0.2
[mg.m^{-3}]

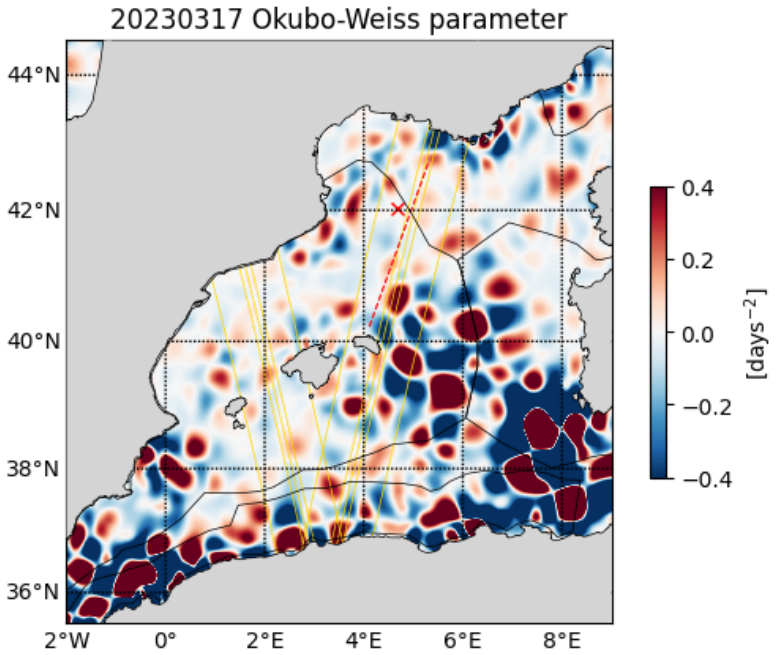

20230316_CLS_CHL
40.5°N
40°N
39.5°N
39°N
38.5°N
38°N
37.5°N
1.5°E
2°E
2.5°E
3°E
3.5°E
4°E
4.5°E
5°E
5.5°E
6°E
6.5°E
0.8
0.6
0.4
0.2
[mg.m^{-3}]

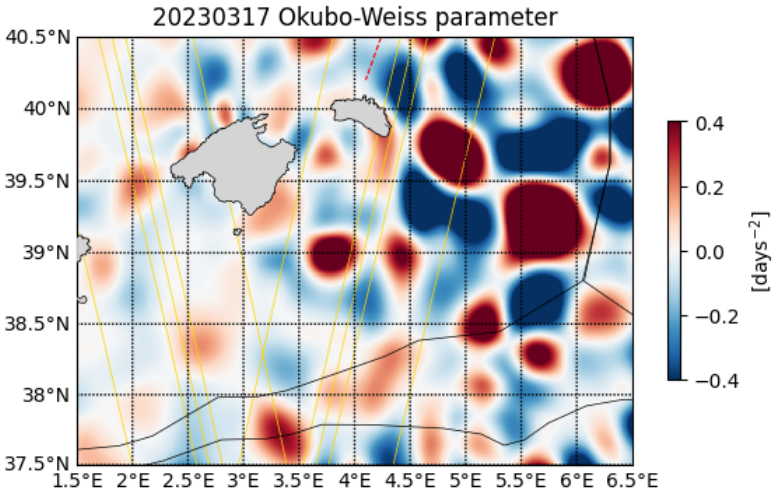

20230316_CLS_CHL
44°N
42°N
40°N
38°N
36°N
2°W
0°
2°E
4°E
6°E
8°E
1.0
0.8
0.6
0.4
0.2
[mg.m^{-3}]

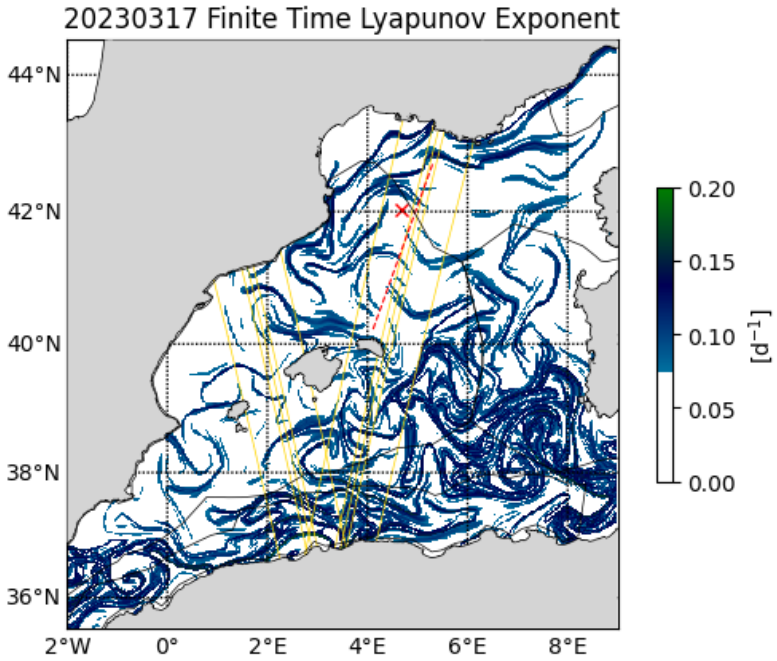

20230316_CLS_CHL_10d
40.5°N
40°N
39.5°N
39°N
38.5°N
38°N
37.5°N
1.5°E
2°E
2.5°E
3°E
3.5°E
4°E
4.5°E
5°E
5.5°E
6°E
6.5°E
0.8
0.6
0.4
0.2
[mg.m^{-3}]

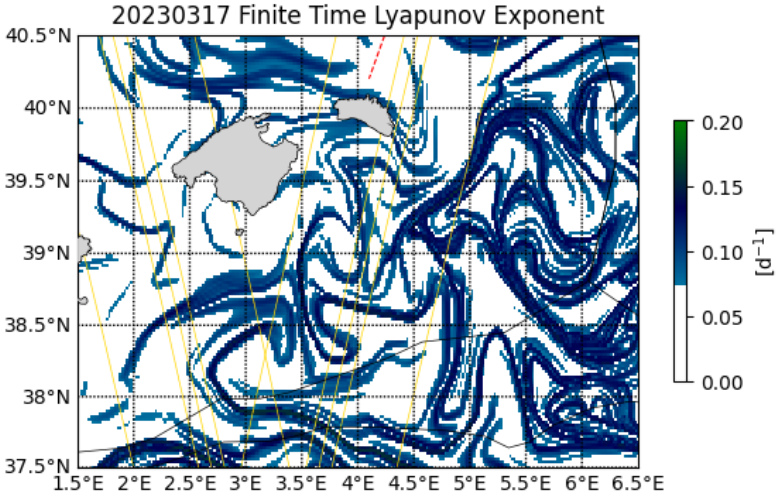

20230317 Kinetic energy
44°N
42°N
40°N
38°N
36°N
2°W
0°
2°E
4°E
6°E
8°E
1500
1000
500
0
[cm².s⁻²]

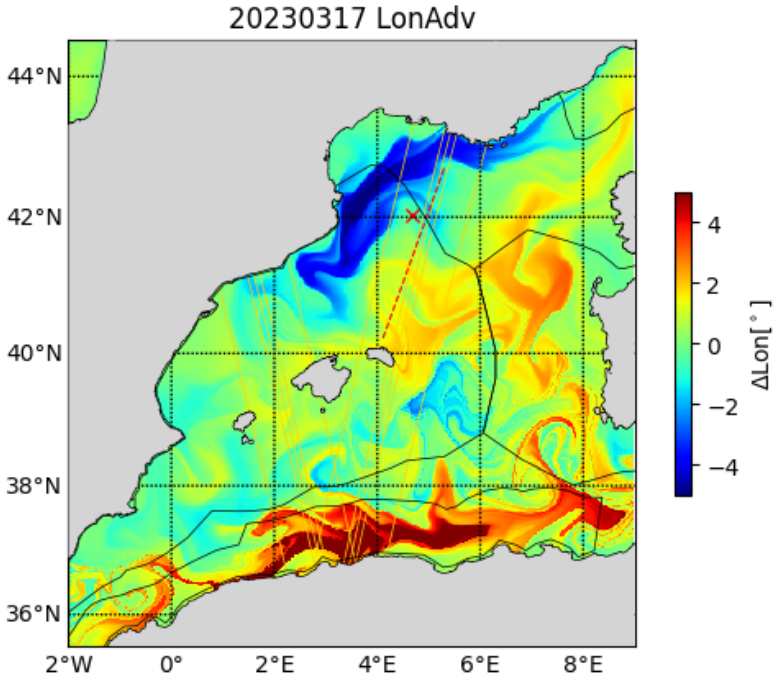

20230317 Kinetic energy
40.5°N
40°N
39.5°N
39°N
38.5°N
38°N
37.5°N
1.5°E
2°E
2.5°E
3°E
3.5°E
4°E
4.5°E
5°E
5.5°E
6°E
6.5°E
1250
1000
750
500
250
0
[cm².s⁻²]

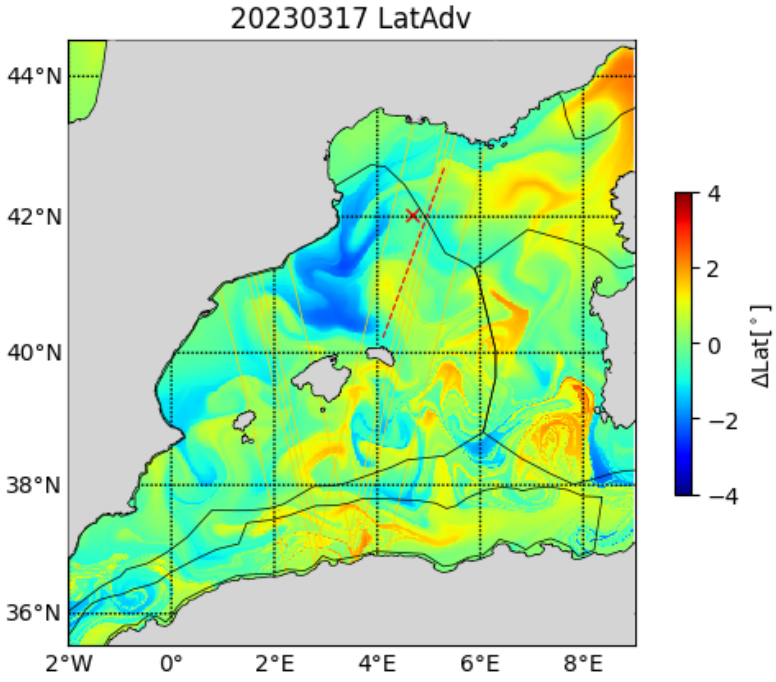

20230317 Okubo-Weiss parameter
44°N
42°N
40°N
38°N
36°N
2°W
0°
2°E
4°E
6°E
8°E
0.4
0.2
0.0
−0.2
−0.4
[days^{-2}]

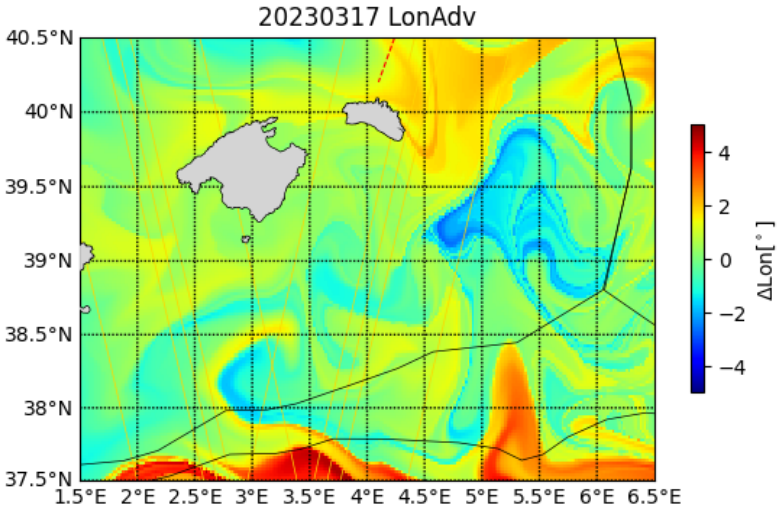

20230317 Okubo-Weiss parameter
40.5°N
40°N
39.5°N
39°N
38.5°N
38°N
37.5°N
1.5°E
2°E
2.5°E
3°E
3.5°E
4°E
4.5°E
5°E
5.5°E
6°E
6.5°E
0.4
0.2
0.0
−0.2
−0.4
[days^{-2}]

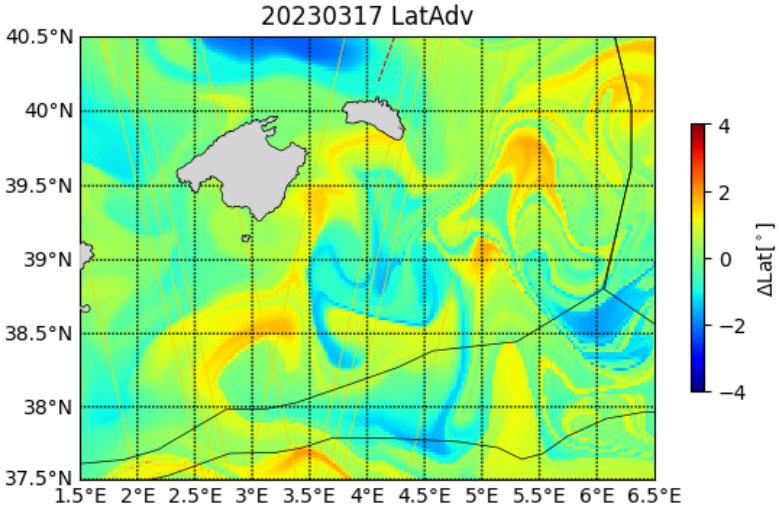

20230317 Finite Time Lyapunov Exponent
44°N
42°N
40°N
38°N
36°N
2°W
0°
2°E
4°E
6°E
8°E
0.20
0.15
0.10
0.05
0.00
[d⁻¹]

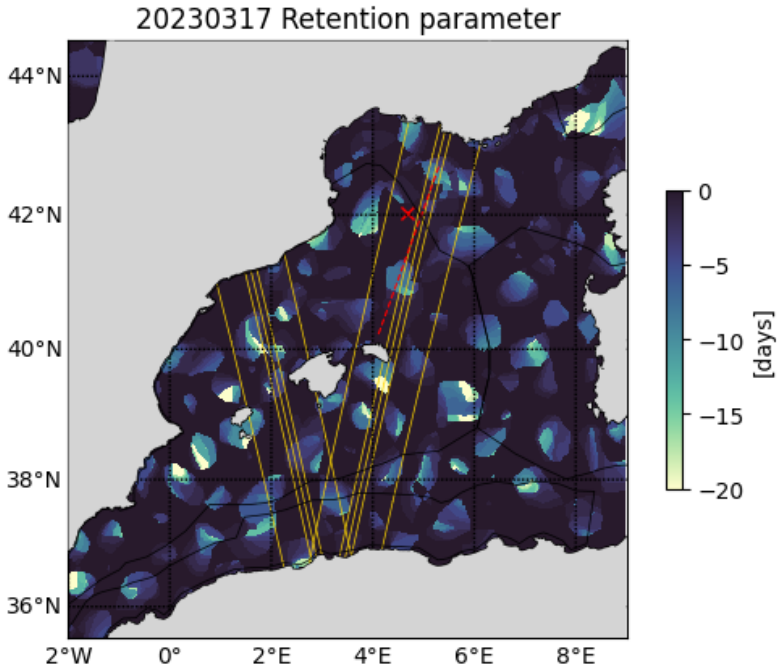

20230317 Finite Time Lyapunov Exponent
40.5°N
40°N
39.5°N
39°N
38.5°N
38°N
37.5°N
1.5°E
2°E
2.5°E
3°E
3.5°E
4°E
4.5°E
5°E
5.5°E
6°E
6.5°E
0.20
0.15
0.10
0.05
0.00
[d⁻¹]

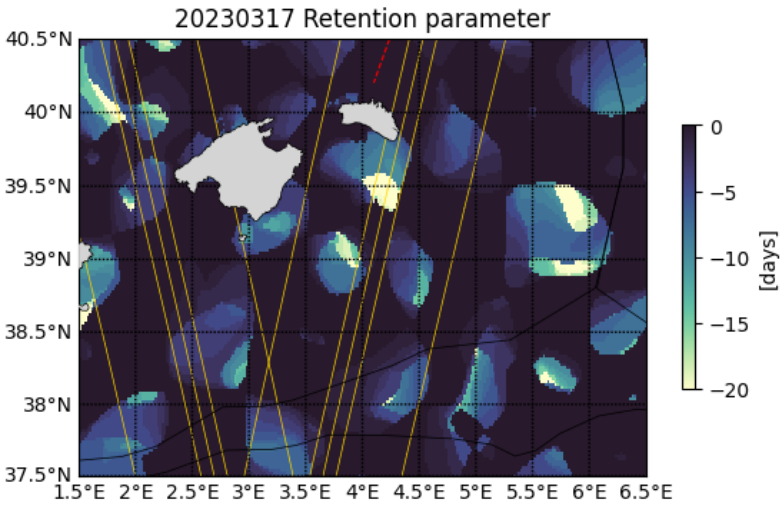

20230317 LonAdv
44°N
42°N
40°N
38°N
36°N
2°W
0°
2°E
4°E
6°E
8°E
4
2
0
−2
−4
ΔLon[°]

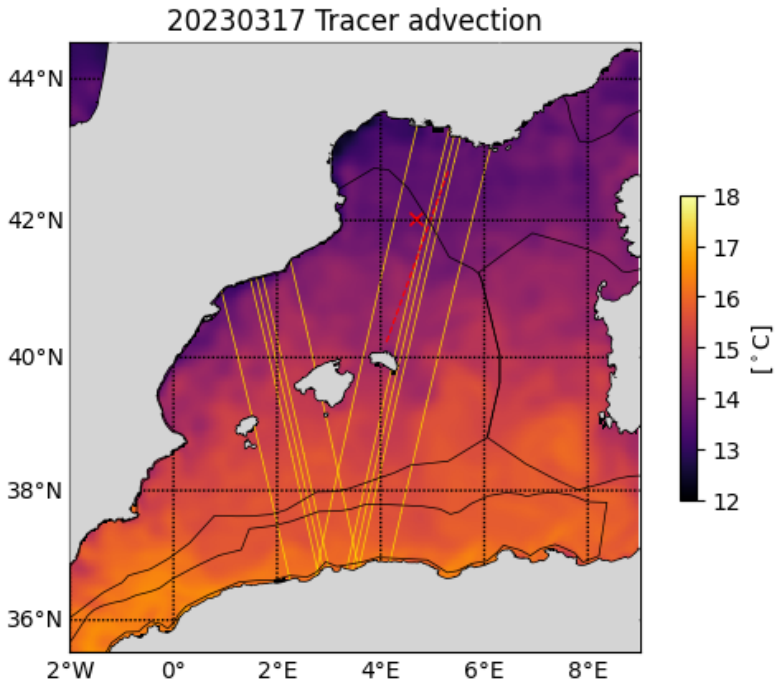

20230317 LatAdv
44°N
42°N
40°N
38°N
36°N
2°W
0°
2°E
4°E
6°E
8°E
4
2
0
−2
−4
ΔLat[°]

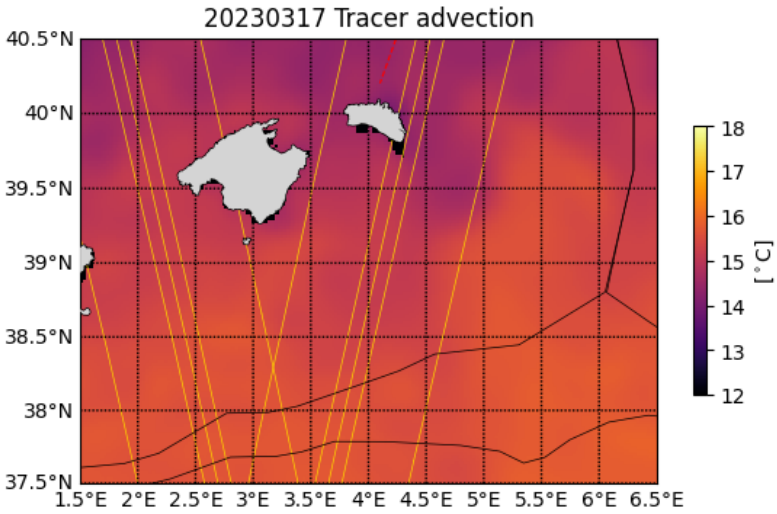

20230317 LonAdv
40.5°N
40°N
39.5°N
39°N
38.5°N
38°N
37.5°N
1.5°E 2°E 2.5°E 3°E 3.5°E 4°E 4.5°E 5°E 5.5°E 6°E 6.5°E
4
2
0
−2
−4
ΔLon[°]


20230317 LatAdv
40.5°N
40°N
39.5°N
39°N
38.5°N
38°N
37.5°N
1.5°E 2°E 2.5°E 3°E 3.5°E 4°E 4.5°E 5°E 5.5°E 6°E 6.5°E
4
2
0
−2
−4
ΔLat[°]


20230317 Retention parameter
44°N
42°N
40°N
38°N
36°N
2°W
0°
2°E
4°E
6°E
8°E
0
−5
−10
−15
−20
[days]


20230317 Retention parameter
40.5°N
40°N
39.5°N
39°N
38.5°N
38°N
37.5°N
1.5°E
2°E
2.5°E
3°E
3.5°E
4°E
4.5°E
5°E
5.5°E
6°E
6.5°E
0
−5
−10
−15
−20
[days]


20230317 Tracer advection
44°N
42°N
40°N
38°N
36°N
2°W
0°
2°E
4°E
6°E
8°E
18
17
16
15
14
13
12
[°C]


20230317 Tracer advection
40.5°N
40°N
39.5°N
39°N
38.5°N
38°N
37.5°N
1.5°E
2°E
2.5°E
3°E
3.5°E
4°E
4.5°E
5°E
5.5°E
6°E
6.5°E
18
17
16
15
14
13
12
[°C]