

1. Project Information

Proposal reference number¹	
Project Acronym (ID)²	FRIPP-spring
Title of the project³	Frontal dynamics influencing Primary Production: investigating the onset of the spring bloom mechanism through gliders
Host Research Infrastructure⁴	SOCIB
Starting date - End date⁵	1 March - 30 April 2021
Name of Principal Investigator⁶	ANTONIO OLITA ISAC - Institute of Atmospheric sciences and Climate, Cagliari section, Italy, % Dipartimento di Fisica - Università degli studi di Cagliari, Cittadella Universitaria di Monserrato
Home Laboratory Address	antonio.olita@cnr.it
E-mail address	+39 328 532 11 16
Telephone	

2. Project objectives⁷ (250 words max.)

The project aims to study, through a multisensor sea-glider mission supported by modeled and remotely-sensed data, the impact of frontal dynamics on the Phytoplankton production and distribution as inferred from fluorometric measurements.

The specific objectives are the following:

¹ Reference number assigned to the proposal by the TA-Office.

² User-project identifier used in the proposal.

³ Title of the approved proposal. The length cannot exceed 255 characters

⁴ Name of the installation/infrastructure accessed with this project. If more than one installations/infrastructures are used by the same project, please list them in the box.

⁵ Specify starting and end date of the project (including eventual preparatory phase before the access).

⁶ Fill in with the full contact of the Principal Investigator (user group leader).

⁷ Write the short-term, medium and long-term objectives of the project. Use no more than 250 words.

1) Observe the dynamics of the front in terms of: horizontal and vertical velocities; instabilities; mixing and enhanced dynamical stratification

2) Study the impact of such frontal dynamics on new production and on displacement of phytoplanktonic biomass in a well mixed regime, during the first onset of the early spring bloom, *and characterize phytoplankton community composition through an Optical Community Index*

3. Main achievements and difficulties encountered (250 words max.)⁸

No particular technical difficulties have been encountered. The sampling was postponed of some week because of logistic issues. The glider started sampling the area on April 5. The mission ended on May 3, 2021. The main technical difficulties were due to strong currents encountered that obliged to correct the trajectory of the glider twice. Postponing the glider mission allowed to observe already structured DCM instead of the initiation of the Bloom along the front. Anyway interesting features have been matched.

4. Dissemination of the results⁹

Dissemination by preparation of abstract for congresses was stopped because of COVID-19 pandemic that didn't allow people to attend conferences . Anyway I'm working on a paper based on the results of the sampling. Compatible with pandemic dynamic, I will also attend congresses (e.g. next EGU in WIEN) in 2022 to disseminate results.

Data are available here:

https://thredds.socib.es/thredds/catalog/auv/glider/sdeep06-scb_sldeep006/L0/2021/catalog.html?dataset=auv/glider/sdeep06-scb_sldeep006/L0/2021/dep0003_sdeep06_scb_sldeep006_L0_2021-03-30_data_dt.nc

⁸ Describe briefly the main achievements obtained and possible impacts, as well as possible difficulties encountered during the execution of the project. Use no more than 250 words.

⁹ Describe any plan you have to disseminate and publish the results resulting from work carried out under the Transnational Access activity in JERICO -S3: scientific articles, books - or part of them -, patents, as well as reports and communication to scientific conferences, meetings and workshops. Highlight peer-reviewed publications. **Note that any publications resulting from work carried out under the JERICO -S3 TA activity must acknowledge the support of the European Commission – H2020 Framework Programme, JERICO -S3 under grant agreement No. 871153.**

https://thredds.socib.es/thredds/catalog/auv/glider/sdeep06-scb_sldeep006/L1/2021/catalog.html?dataset=auv/glider/sdeep06-scb_sldeep006/L1/2021/dep0003_sdeep06_scb_sldeep006_L1_2021-03-30_data_dt.nc

https://thredds.socib.es/thredds/catalog/auv/glider/sdeep06-scb_sldeep006/L2/2021/catalog.html?dataset=auv/glider/sdeep06-scb_sldeep006/L2/2021/dep0003_sdeep06_scb_sldeep006_L2_2021-03-30_data_dt.nc

5. Technical and Scientific preliminary Outcomes (2 pages max.)¹⁰

The sampling was conducted as planned. A “butterfly” sampling was designed and conducted as represented in figure 1, where the planned track it is also shown.

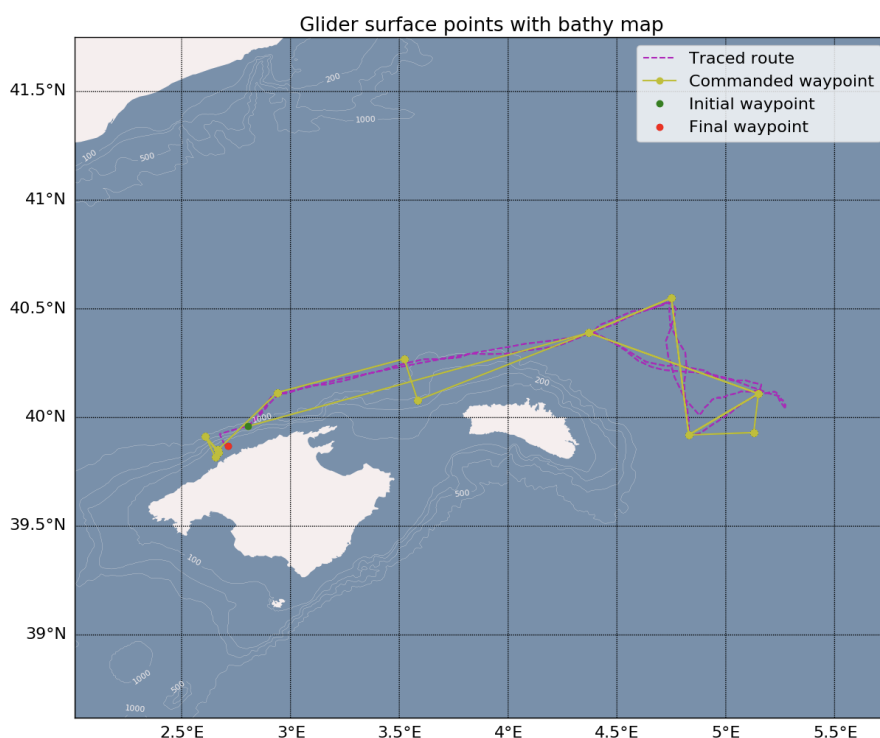


Fig.1 - Planned vs actual tracks of the glider flight.

As above mentioned, a structured Deep Chlorophyll Maximum was already onset on the area and period sampled, as a consequence of the dynamical and thermal stratification.

¹⁰ Describe in detail results and main findings of your experiment at the present stage.

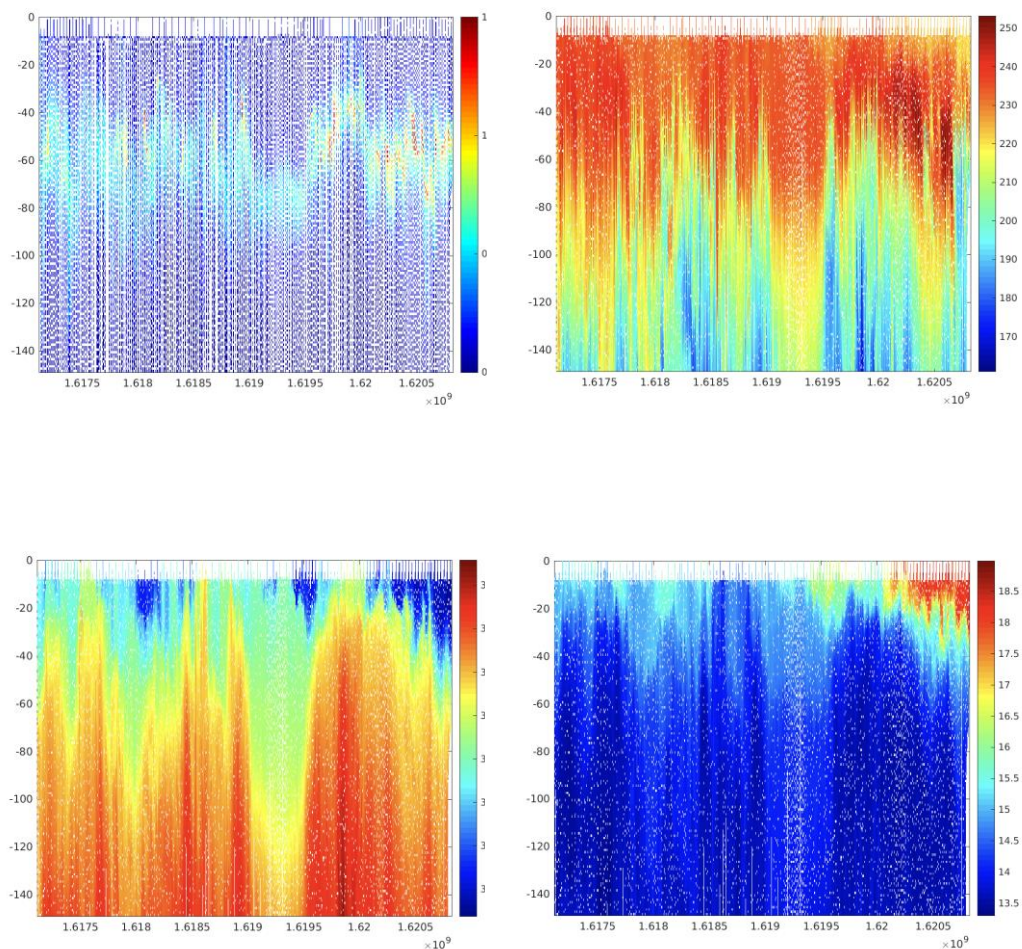


Fig.2 - From top left, clockwise: Chlorophyll, Oxygen concentration, Temperature and Salinity sections.

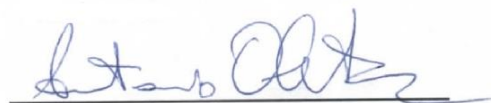
In figure 2 the modulation of biological features (namely CHI concentration and Oxygen distribution) operated by physical features (the salinity front) are evident in the section. In particular the shallowing of the DCM depth in correspondence of the salinity front and the larger Chl concentration are probably linked to an enhanced production (as testified by the exceeding Oxygen concentration just above the production area).

The preliminary results are very promising and further analysis will be conducted to assess the role of the front in the increased DCM production.

[Location], [Date (dd/mm/yyyy)]

Cagliari, September 7, 2021

Location and date



Signature of principal investigator