BOUSSOLE Monthly Cruise Report

Cruise 219
June 15 & 17, 2020

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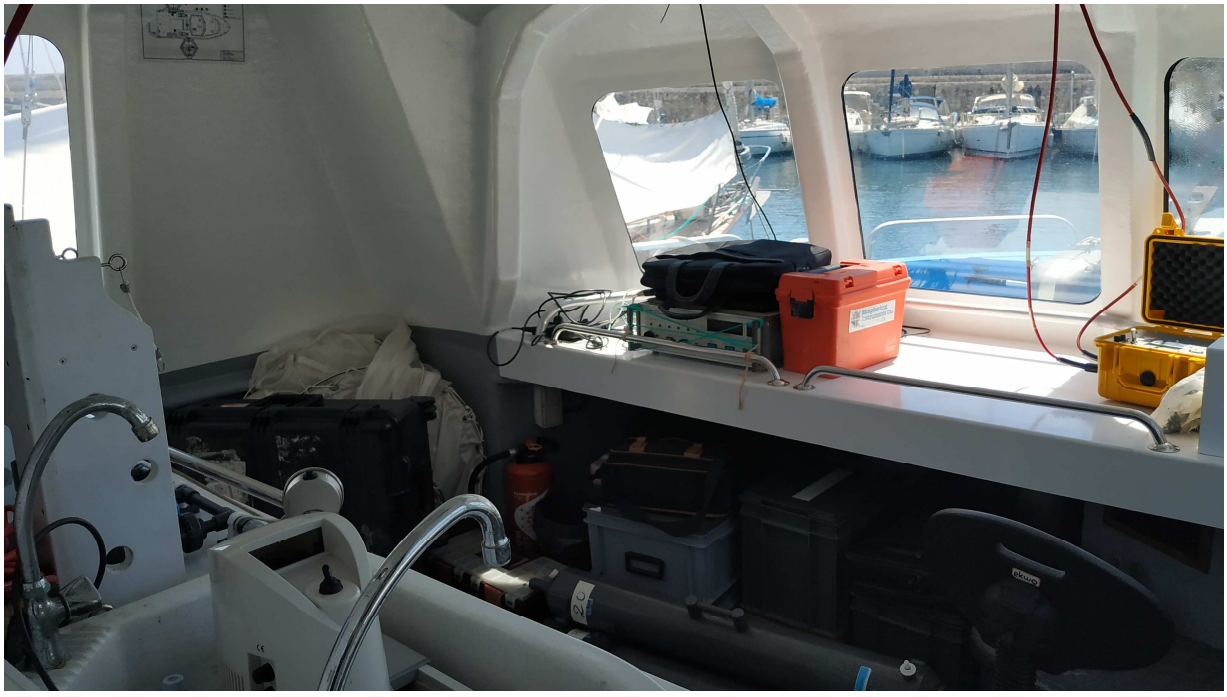

A view from the R/V *Sagitta III*'s lab in the Villefranche-sur-mer harbour.

BOUSSOLE project

ESA/ESRIN contract N° 4000119096/17/I-BG

June 30, 2020

Foreword

This report is part of the technical report series that is being established by the BOUSSOLE project.

BOUSSOLE is funded and supported by the following Agencies and Institutions

European Space Agency

Centre National d'Etudes Spatiales, France

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Cruise Objectives

Routine operations

Multiple Biospherical's C-OPS (Compact Optical Profiling System) radiometric profiles are performed at the BOUSSOLE site 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 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. CTD deployments are required at the start and the end of the C-OPS profiling day and around noon in the longer summer days or when there is a high possibility of a satellite matchup. The CTD package also includes a Chl fluorometer. Additional instrumentation for measurement of inherent optical properties has been added from December 2011. The package includes a hyperspectral absorption meter (Hobilabs a-Sphere), a multispectral backscattering meter (Hobilabs Hydroscat-6) and a multispectral beam transmissometer (Hobilabs Gamma-4). A CTD cast including a 0.2 µm filter installed on the inlet tube of the a-Sphere is to be performed once per cruise at the BOUSSOLE site for the dissolved matter absorption measurements. This cast will be stopped at ten depths during 2 or 7 min depending on the depths in order to ensure that the integrating cavity of the a-Sphere be completely filled at each of these depths during the ascent of the CTD.

Seawater samples are to be collected, filtered and stored into liquid nitrogen for subsequent HPLC pigment and particle absorption spectrophotometric filter analysis in the lab. Three replicates samples are to be collected at surface for total suspended matter weighting in the lab.

Divers check the underwater state of the buoy structure and instrumentation, take pictures for archiving, clean the sensor optical surfaces, and then take again some pictures after cleaning. Divers also put a neoprene cap on the backscattering meter and on the transmissometers for acquiring dark measurements (started in April 2009).

In addition, water samples are to be collected at two depths (5 m and 10 m) for dissolved oxygen (DO), total alkalinity (TA) and total inorganic carbon (TC) analysis (from March 2014). This operation is part of the BIOCAREX ANR project, in collaboration with the LOCEAN in Paris (J. Boutin and collaborators). The TA/TC samples will be processed by the National service for such analyses (SNAPOCO – LOCEAN in Paris). The results will allow checking the data collected by the two pCO_2 CARIOCA sensors and the two optodes installed on the buoy at 3 m and 10 m.
Water samples are to be collected at four depths for metagenomic analyses of different types of Synechococcus, cytometry and nutrients. This operation is part of the EFFICACY ANR project in collaboration with the *Roscoff Biological Station.* The aim is to study the distribution of different types of Synechococcus populations characterized by distinct pigmentation and adaptation to the colour of light. It includes two years of cytometry and metagenomic sampling at the BOUSSOLE site.

Further details about these operations and the data collection and processing protocols are to be found in:
Antoine, D. M. Chami, H. Claustre, F. D'Ortenzio, A. Morel, G. Bécu, B. Gentili, F. Louis, J. Ras, E. Roussier, A.J. Scott, D. Tailliez, S. B. Hooker, P. Guevel, J.-F. Desté, C. Dempsey and D. Adams. 2006, BOUSSOLE: a joint CNRS-INSU, ESA, CNES and NASA Ocean Color Calibration And Validation Activity. NASA Technical memorandum N° 2006 - 214147, 61 pp.
(http://www.obs-vlfr.fr/Boussole/html/publications/pubs/BOUSSOLE_TM_214147.pdf)

Additional operations

Monthly servicing cruises could not be carried out as normal on the R/V *Téthys*-II from April to May 2020 because of the restrictions due to the Covid-19 pandemic (all activities on the R/V *Téthys II* were cancelled until September). We were allowed to use the R/V *Sagitta III* instead, for joint operations of the BOUSSOLE and MOOSE programs during 2 days per month from June. The first day was dedicated to BOUSSOLE and DYFAMED operations and the second day to BOUSSOLE and its current adjunct operations (OBOO and EFFICACY project).

Cruise Summary

The first day, the cruise was cancelled because of a mechanical problem on the ship (engine overheating) and the second day planned two days after was cancelled because of the bad weather.

Monday 15 June 2020

The first day, a ship engine overheating occurred after 10 miles on our way to BOUSSOLE. It was decided to cancel the cruise and to return to Villefranche-sur-mer.

Wednesday 17 June 2020

Bad weather prevented departure from the Villefranche-sur-Mer harbour.

Pictures taken during this cruise can be found at:
https://photos.app.goo.gl/BiQqDDfJwoz4eysA8

Data from the BOUSSOLE cruises and buoy are available at:
http://www.obs-vlfr.fr/Boussole/html/boussole_data/login_form.php

Cruise Report

Monday 15 June 2020 (UTC)

People on board: Emilie Diamond-Riquier and Eduardo Soto Garcia.

0635 Departure from the Villefranche-sur-mer harbour.
0800 Mechanical problem on the Sagitta III: return to the Villefranche-sur-Mer harbour.
1035 Arrival to the Villefranche-sur-Mer harbour.

Wednesday 17 June

Bad weather prevented departure from the Villefranche-sur-Mer harbour.

Problems identified during the cruise

- The Sagitta-III engine overheating led to cancelling of the BOUSSOLE operations.