

# BOUSSOLE Monthly Cruise Report

**Cruise 181**

**March 06-08, 2017**

Duty Chief: Melek Golbol ([golbol@obs-vlfr.fr](mailto:golbol@obs-vlfr.fr))

Vessel: R/V *Téthys II*  
(Captain: Dany Deneuve)

Science Personnel: Emilie Diamond, Guillaume De Liège, Bastien Gaucher (diver), Melek Golbol, David Luquet and Eduardo Soto Garcia.

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



A view of the *R/V Téthys II* on the BOUSSOLE site with the snow-covered Alps mountains on the background.

**BOUSSOLE project**

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

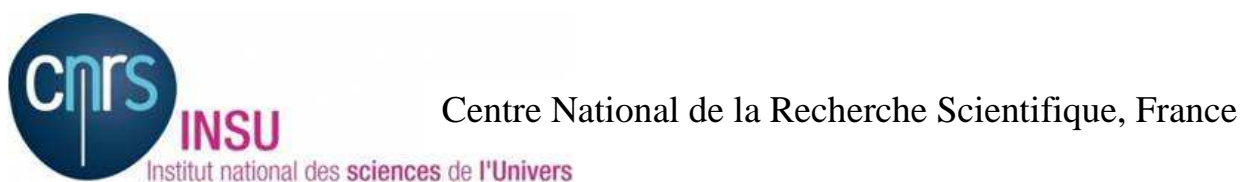
*March 24, 2017*



## 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



## Contents

1. Cruise Objectives
2. Cruise Summary
3. Cruise Report
4. Problems identified during the cruise

Appendices

## 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). Two CTD casts are to be performed at each data acquisition at the BOUSSOLE site: one cast with, and one cast without, a 0.2 $\mu$ m filter added on the a-sphere for the dissolved matter absorption measurements.

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<sub>2</sub> CARIOCA sensors installed on the buoy at 3m and 10m.

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](http://www.obs-vlfr.fr/Boussole/html/publications/pubs/BOUSSOLE_TM_214147.pdf)

### Additional operations

Two water samples for cytometry analysis were collected at 10 m depth in the frame of a collaboration with Collin Roesler (Bowdoin College, Maine, USA), about the installation of an ECO 3X1M multi-channel fluorimeter on the BOUSSOLE buoy at 9 m depth.

The MOOSE DYFAMED cruise was cancelled three days before because of the bad weather. So, the DYFAMED operations were performed during the BOUSSOLE cruise.

## Cruise Summary

The first two days of the cruise, bad weather prevented the departure from the Nice harbour. Therefore, only the third day was used for BOUSSOLE and DYFAMED operations, which included a deep CTD cast and zooplankton nets at the DYFAMED site, diving operations on the BOUSSOLE buoy, downloading of buoy data, optical profiles, a CTD cast with water sampling and a Secchi disk at the BOUSSOLE site.

## Monday 6 March 2017

Bad weather prevented departure from the Nice harbour.

## Tuesday 07 March 2017

Bad weather prevented departure from the Nice harbour.

## Wednesday 08 March 2017

The sea state was slight with a gentle breeze on the morning and a moderate breeze on the afternoon. The sky was blue and the visibility was excellent. It was decided to perform the MOOSE program first because the weather forecasts were better in the afternoon than in the morning, and the diving operations at BOUSSOLE required good weather conditions. Firstly, 3 zooplankton profiles and 1 deep CTD cast were performed at the DYFAMED site. When arrived at the BOUSSOLE site on the afternoon, divers went at sea to clean the sensors, to perform dark measurements of the transmissometers and backscattering meter and to take pictures. In the meantime, surface sensors of the buoy, solar panels and the ARGOS connector were cleaned. Buoy data were retrieved using the cable available on the top of the buoy and with the AK connector.

Then, 2 CTD casts with water sampling and a Secchi disk were performed at the BOUSSOLE site. C-OPS balance tests were performed in order to check and adjust it during the descent phase of the profiles. Finally, 3 C-OPS profiles were performed before returning to the Port of Nice.

Pictures taken during this cruise can be found at:

<https://get.google.com/albumarchive/114686870380724925974/album/AF1QipP3LbASBQQrjYIIgSOu4MFMMi1NpxwnsteHmFaZ>

Data from the BOUSSOLE cruises and buoy are available at:

[http://www.obs-vlfr.fr/Boussole/html/boussole\\_data/login\\_form.php](http://www.obs-vlfr.fr/Boussole/html/boussole_data/login_form.php)

## Cruise Report

### Monday 6 March 2017 (UTC)

Bad weather prevented departure from the Nice harbour.

### Tuesday 07 February 2017 (UTC)

Bad weather prevented departure from the Nice harbour.

### Wednesday 08 February 2017 (UTC)

People on board: Emilie Diamond, Guillaume De Liège, Bastien Gaucher (diver), Melek Golbol, David Luquet and Eduardo Soto Garcia.

0620	Departure from the Nice harbour.
0915	Arrival at the DYFAMED site.
0920	Zooplankton nets x 3 (MOOSE).
1015	Deep CTD cast (MOOSE).
1150	Departure from the DYFAMED site.
1225	Arrival at the BOUSSOLE site. Lunch and water sampling for MOOSE program.
1315	Diving operations: cleaning, dark measurements, pictures.
1330	Cleaning of surface sensors, solar panels and ARGOS connector.
1350	Connexion with the buoy and data retrieval (with AK connector).
1350	CTD 01, 15 m with water sampling at 10 and 5 m for O <sub>2</sub> , TA/TC and TSM.
1400	Secchi disk, 17 m.

1445 CTD 02, 400 m with water sampling at 400, 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC,  $a_p$  and cytometry.  
1530 C-OPS balance tests.  
1600 COPS 01, 02, 03.  
1635 Departure to the Nice harbour.  
1945 Arrival at the Nice harbour.

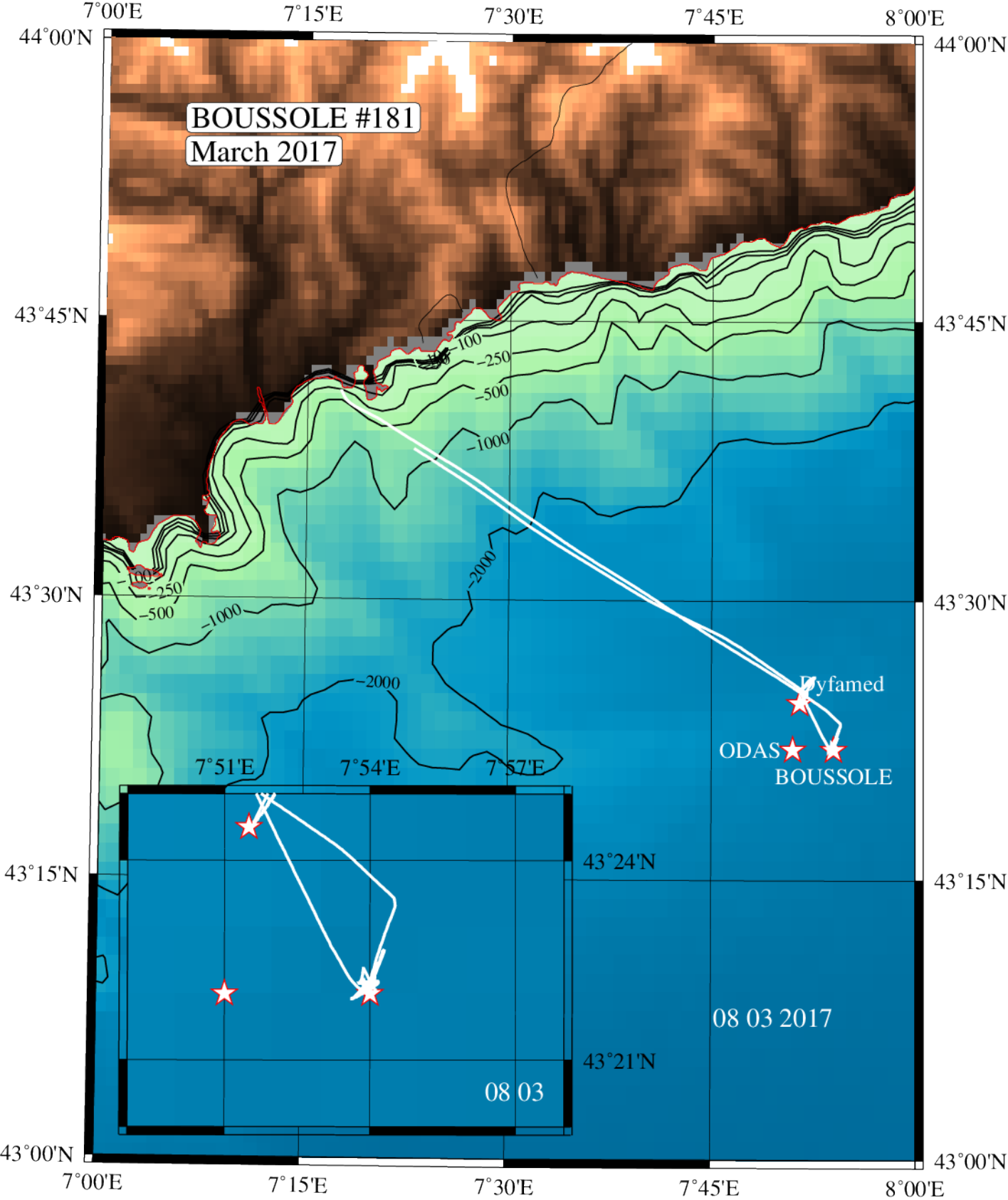
## **Problems identified during the cruise**

- The IOP package was not available for this cruise.

# Appendices

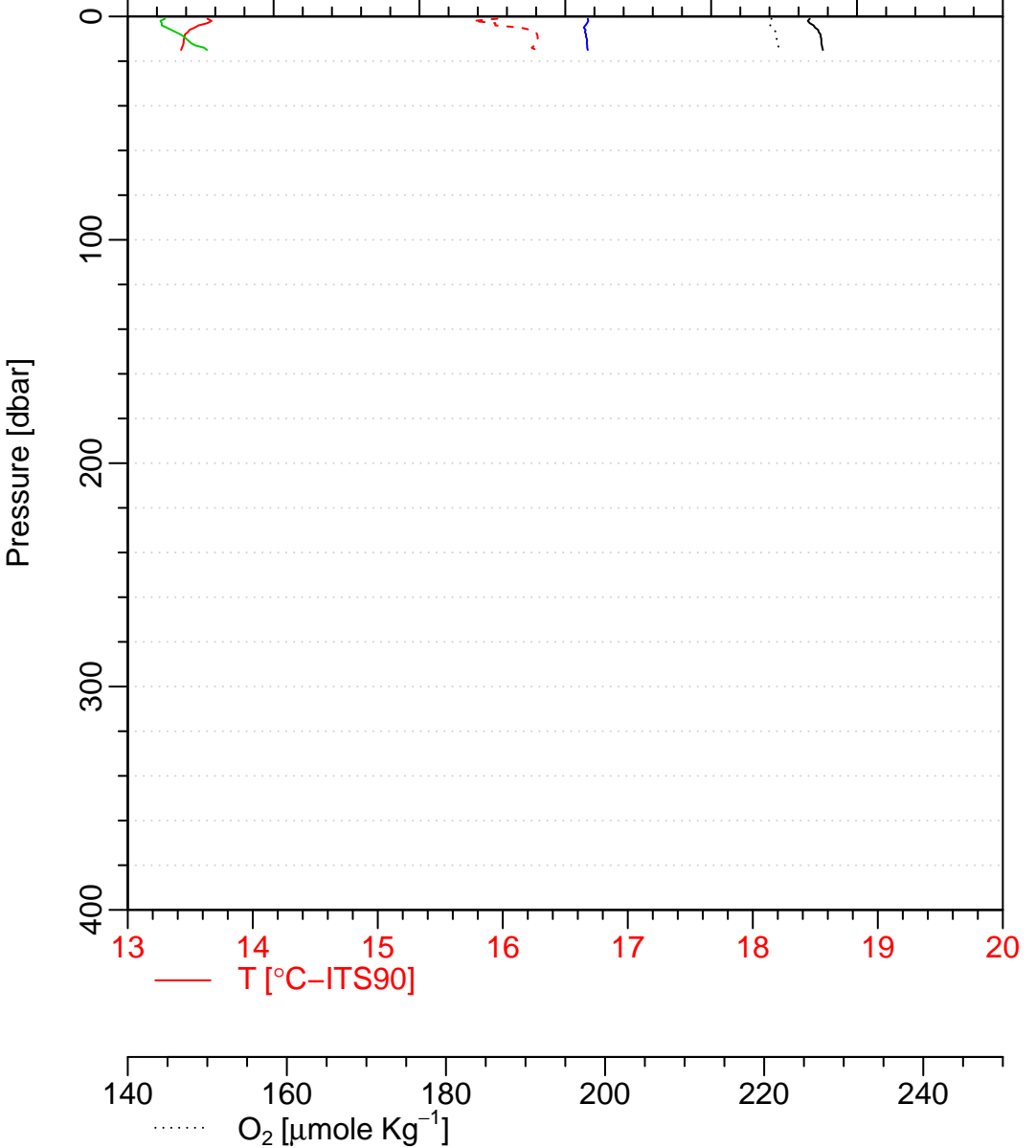
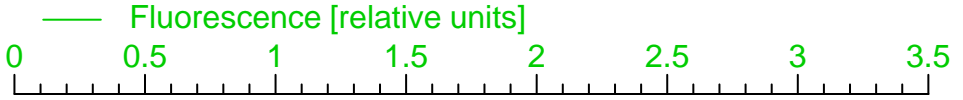






bous181\_01

Date = 08/03/2017  
Heure debut [TU] = 13:36  
Longitude = 007 53.98 E  
Latitude = 43 22.17 N



bous181\_02

Date = 08/03/2017  
Heure debut [TU] = 14:44  
Longitude = 007 53.85 E  
Latitude = 43 22.15 N

