

The BOUSSOLE project technical reports; report #7-8, issue 1.

# **BOUSSOLE buoy deployment & maintenance log.**

## **February 23, 2007 – September 21, 2007**

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**BOUSSOLE project**

**ESA/ESRIN contract N° 17286/03/I-OL**

**Deliverable from WP#300/100**

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*October 08, 2007*

## Foreword

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

**BOUSSOLE** is funded/supported by the following Agencies, Institutions or Programs



European Space Agency



Centre National d'Etudes Spatiales, France



National Aeronautics and Space Administration of the USA



Centre National de la Recherche Scientifique, France



Institut National des Sciences de l'Univers, France



Université Pierre & Marie Curie, France



Observatoire Océanologique de Villefranche sur mer, France

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## **1. SCOPE OF DOCUMENT**

The BOUSSOLE buoy deployment and maintenance log is a record of all events that occur from the deployment to the recovery of one of the two upper sections of the buoy.

The aim is to keep track of all maintenance operations, such as instruments cleaning or rotations, instruments malfunctions, incidents with the buoy structure, if any, biofouling development and so on.

This information is crucial to a subsequent correct interpretation of the data.

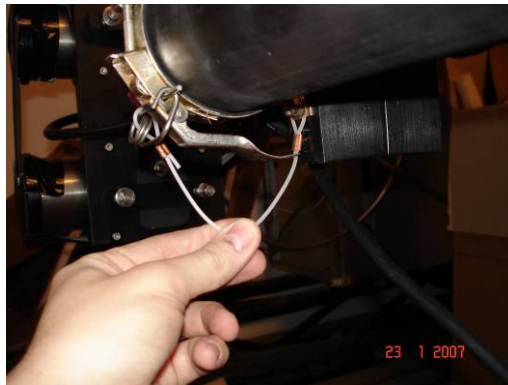
Keeping track of these events also allows their analysis in view of the permanent improvement of protocols.

The present report concerns "buoy deployment 5", from February 23 of 2007 to September 21 of 2007.

## 2. DESCRIPTION OF OPERATIONS

### 2.1 UPPER SECTION PREPARATION (2006-12 & 2007-01)

As usual, the buoy was equipped in the CCI local in Villefranche-Sur-Mer, and again the preparation was without any surprise thanks to the experience of the previous deployments. Copper sheets and pieces were again fixed wherever possible to avoid bio-fouling arising (see pictures), as well as some copper tape around the transmissometers.





## 2.2 MOORING DEPLOYMENT

### 2.2.1 Friday 23<sup>rd</sup> February 2007

The new upper structure of the buoy was brought to the "Rochambeau" area at 07am with the help of about 10 LOV colleagues. Two hour later, the buoy upper structure was equipped with the arms and ready to leave. The helicopter pilot was called to fetch the buoy a few minutes before 09am.

One hour later, the helicopter brought back the ancient buoy that was disassembled by divers on the preceding day. All the exchange operations were performed without any problem.

At this date, buoy is equipped with

- DACNet #2
- Stan's rads set (OCI s/n 030, 050, 048, 163, 164 and OCR s/n 036 and 037), MVDS062, OCP036 and OCP037
- HS2 #2031247
- No strain sensor
- Transmissionmeter C-Star #626PR (4m) and #847PR(9m)
- Fluorometer ECO\_FLNTUS #608 (4m) and #609 (9m)
- ARGOS beacon #17152
- CTD Seabird 37SI-30260-2404

### 2.2.2 Monday 05<sup>th</sup> March 2007

This day was used for a MARE NOSTRUM diving company cruise. Divers checked the buoy structure and sensors state under the sea surface, and cleaned the optical surface of the instruments.

### 2.2.3 Tuesday 10<sup>th</sup> April 2007

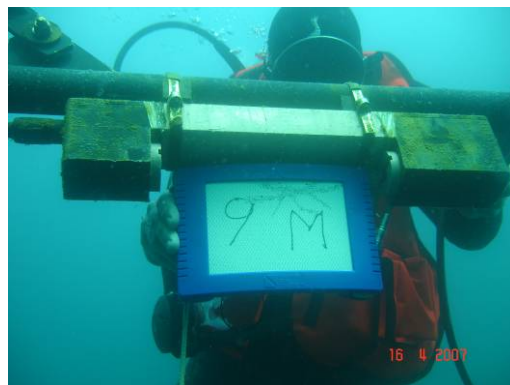
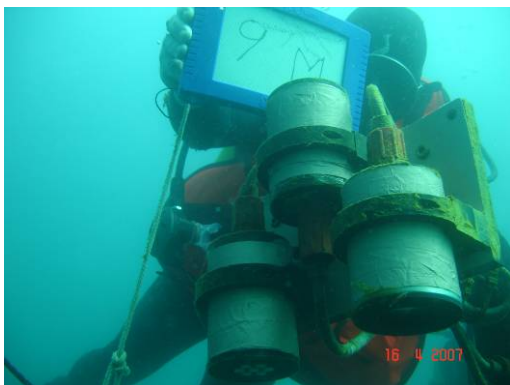
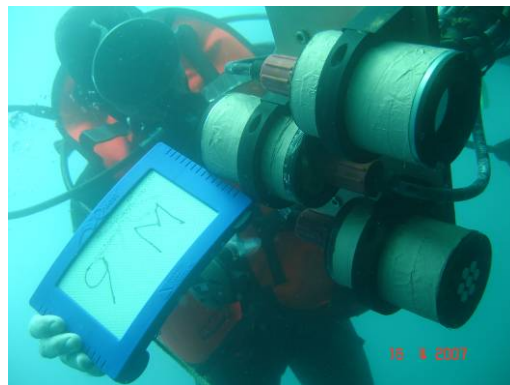
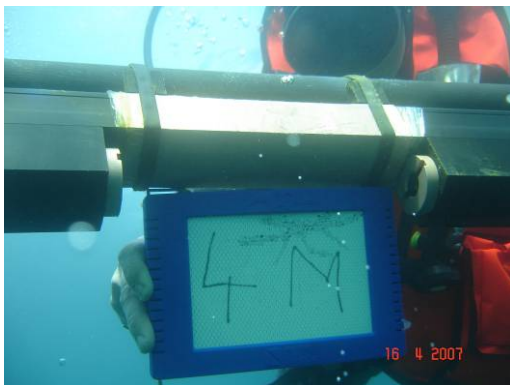
This day was used for a MARE NOSTRUM diving company cruise. Divers checked the buoy structure and sensors state under the sea surface, and cleaned the optical surface of the instruments.

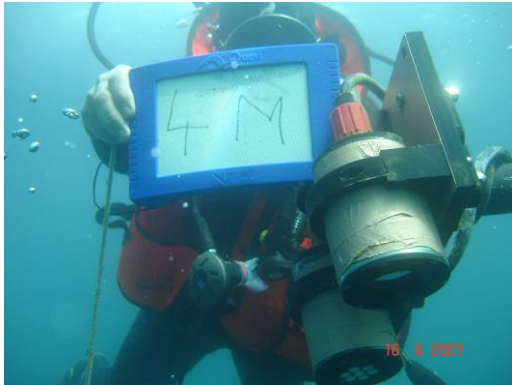
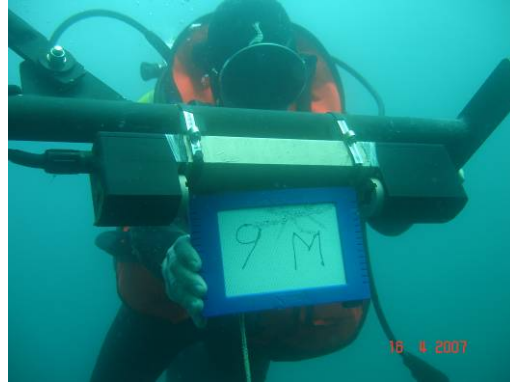
### 2.2.4 Monday 16<sup>th</sup> April 2007

This day is part of the BOUSSOLE 63 mission. Divers checked the buoy structure and sensors state under the sea surface, and cleaned the optical surface of the instruments.

Since the first day of the deployment, the daily ARGOS messages didn't include Temperature nor CTD depth data. Furthermore, since April 12<sup>th</sup>, 2007, these daily messages even stopped to be sent. A successful buoy connection and data retrieval from the R/V Tethys-2 on April 15<sup>th</sup>, 2007 refuted a buoy system halt and allowed to upgrade the "nodeman.jar" file with a bug-free version sent by Satlantic few days before the cruise (they found a bug in the former version).

A simple ARGOS beacon electronic contacts cleaning fix the usual problem of the daily messages sending.



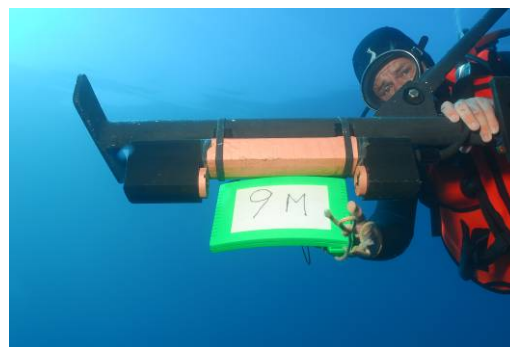


#### 2.2.5 Monday 07<sup>th</sup> May 2007

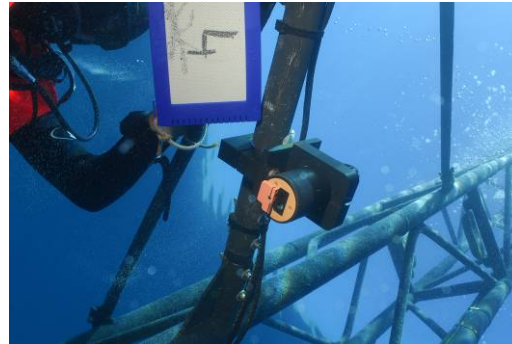
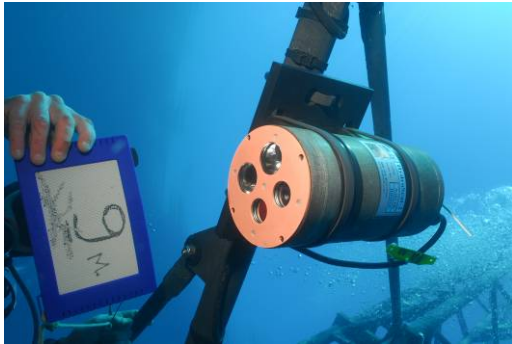
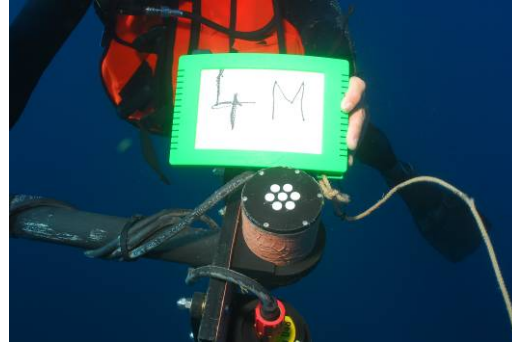
This day was used for a MARE NOSTRUM diving company cruise. Divers checked the buoy structure and sensors state under the sea surface, and cleaned the optical surface of the instruments.

#### 2.2.6 Saturday 19<sup>th</sup> May 2007

This day is part of the BOUSSOLE 64 mission. Divers checked the buoy structure and sensors state under the sea surface, and cleaned the optical surface of the instruments.







### 2.2.7 Friday 25<sup>th</sup> May 2007

Since 21<sup>st</sup> of May, ARGOS daily messages showed constant values of the parameters. So an emergency cruise was organized onboard a 11 meters rental ship (from "ABYS" company in Antibes). Unfortunately, no divers have been available for that cruise, and no buoy connection was possible this day, even with a manual "AK" switch of the DACNet (free diving with a scuba).





#### 2.2.8 Sunday 06<sup>th</sup> June 2007

Another rental ship from ABYS, brought 3 divers at the BOUSSOLE site. After having exchanged the DACNet hard disk (IBM Micro Drive), all was working fine again.



#### 2.2.9 Thursday 21<sup>st</sup> June 2007

This day is part of the BOUSSOLE 65 mission. Divers checked the buoy structure and sensors state under the sea surface, and cleaned the optical surface of the instruments.

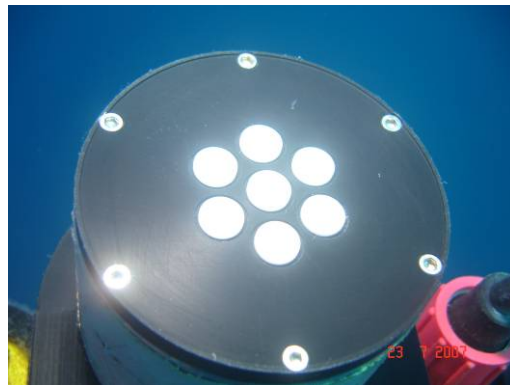
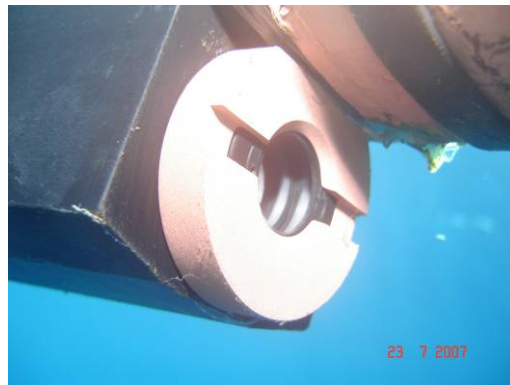
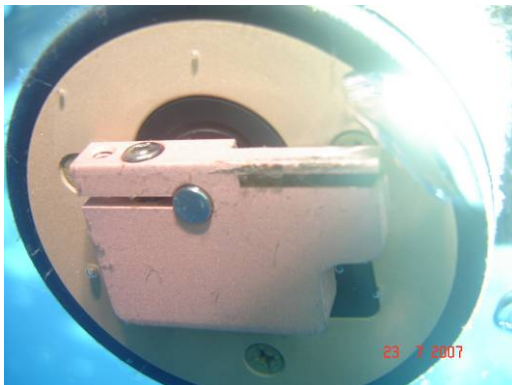
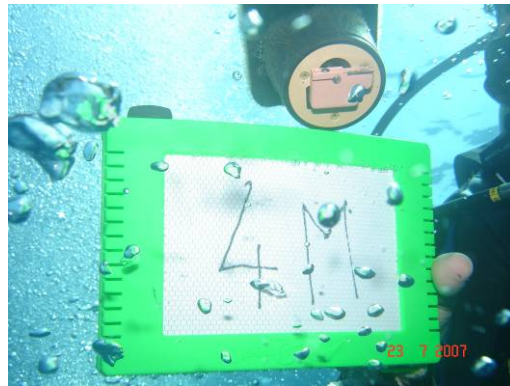
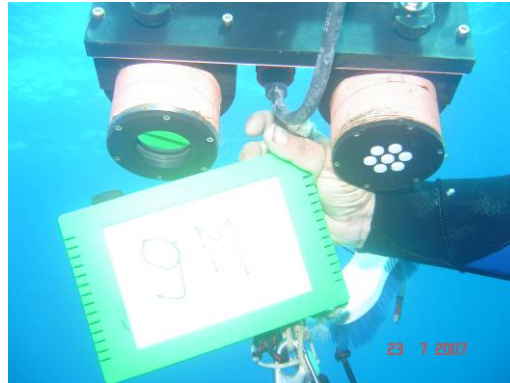
Since last cruise on the rental ship (06<sup>th</sup> June), the buoy clock was reset to January 1970, despite the fact that the small battery (inside of the DACNet) was exchanged and the clock reset to the good date on 06<sup>th</sup> of June...

#### 2.2.10 Friday 06<sup>th</sup> July 2007

This day was used for a MARE NOSTRUM diving company cruise. Divers checked the buoy structure and sensors state under the sea surface, and cleaned the optical surface of the instruments.

2.2.11 Monday 23<sup>rd</sup> July 2007

This day is part of the BOUSSOLE 66 mission. Divers checked the buoy structure and sensors state under the sea surface, and cleaned the optical surface of the instruments.

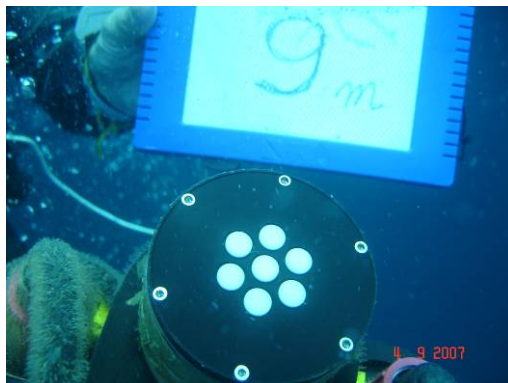
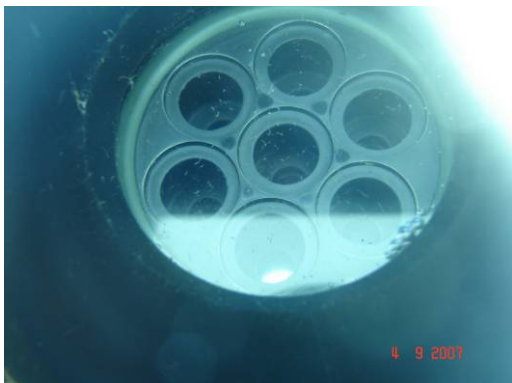
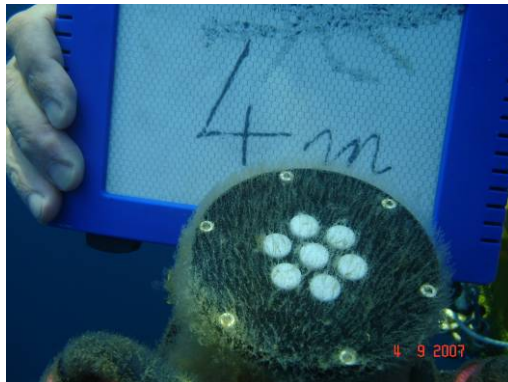
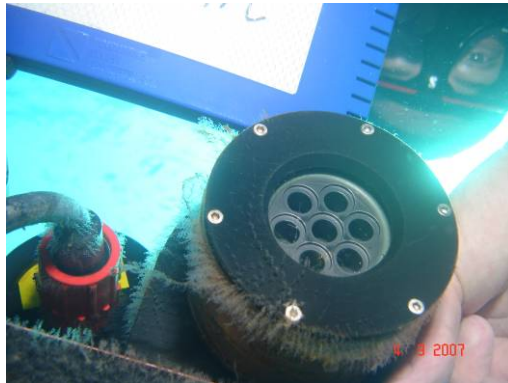
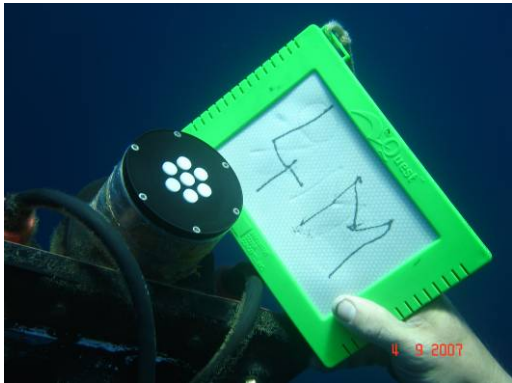


**2.2.12 Monday 06<sup>th</sup> August 2007**

This day was used for a MARE NOSTRUM diving company cruise. Divers checked the buoy structure and sensors state under the sea surface, and cleaned the optical surface of the instruments.

**2.2.13 Tuesday 04<sup>th</sup> September 2007**

This day is part of the BOUSSOLE 67 mission. Divers checked the buoy structure and sensors state under the sea surface, and cleaned the optical surface of the instruments.



#### 2.2.14 Friday 21<sup>st</sup> September 2007

The upper part of the buoy was recovered with the help of the usual divers (from IXSEA surveys). No difficulties were encountered during all the scheduled operations.



#### 2.3 ENTIRE MOORING REINSTALLATION (2007-09-22)

This operation was scheduled with the help of a helicopter to bring the upper part on BOUSSOLE site, while the CASTOR-2 vessel helped the divers and sailors to recover all the mooring line (21<sup>st</sup> Sept.) and to deploy again a brand new mooring line (including new acoustic releases, kevlar cable, chain, manilas etc...).

### **3. QUANTITATIVE SUMMARY**

The deployment lasted 211 days, among which 18 days were without data acquisition, due to a stuck Micro Drive.

### **4. INSTRUMENT SCHEDULE**

?????

### **5. ANY PROBLEMS ENCOUNTERED ?**

1 - MicroDrive bugged for unknow reason...

### **6. LESSONS LEARNED**

sidem section 5 !!!

### **7. ACKNOWLEDGEMENTS**

The BOUSSOLE project has been set up thanks to the work of numerous people, and thanks to the support and funding of several Agencies and Institutions. The latter are listed in the foreword of this report. Specifically, the following contracts are acknowledged : the French Space Agency CNES provided funds through the TAOB and TOSCA scientific committees, ESA through ESTEC contract N°14393/00/NL/DC, including CCNs #1, #2 and #3, ESRIN through contract N° 17286/03/I-OL, and NASA through a "Letter of Agreement". Funding has been also obtained from the French CSOA committee and the "Observatoire Océanologique de Villefranche".

The crews and Captains of the following ships are also warmly thanked for their help at sea : the Castor-02 vessel from the Fosevel Marine company (buoy/mooring operations), the INSU R/V Téthys-II and Georges Petit (regular monthly cruises), the GG-IX from the Samar company and the Nika-III (on-demand short operations on site). Pilots and crew members of the Valair and Commerçair helicopter companies are also thanked for their willingness in accomplishing for us unusual survey missions above the BOUSSOLE site. Emmanuel Bosc, Maria Vlachou, Guillaume Lecomte, who have occasionally provided some help in collecting data, are also thanked for their help.

The French institute IFREMER and the Norwegian Marintek company are also thanked for their help and fairness in the engineering studies that were ordered to them after the major failure of the buoy in spring of 2002.

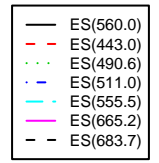
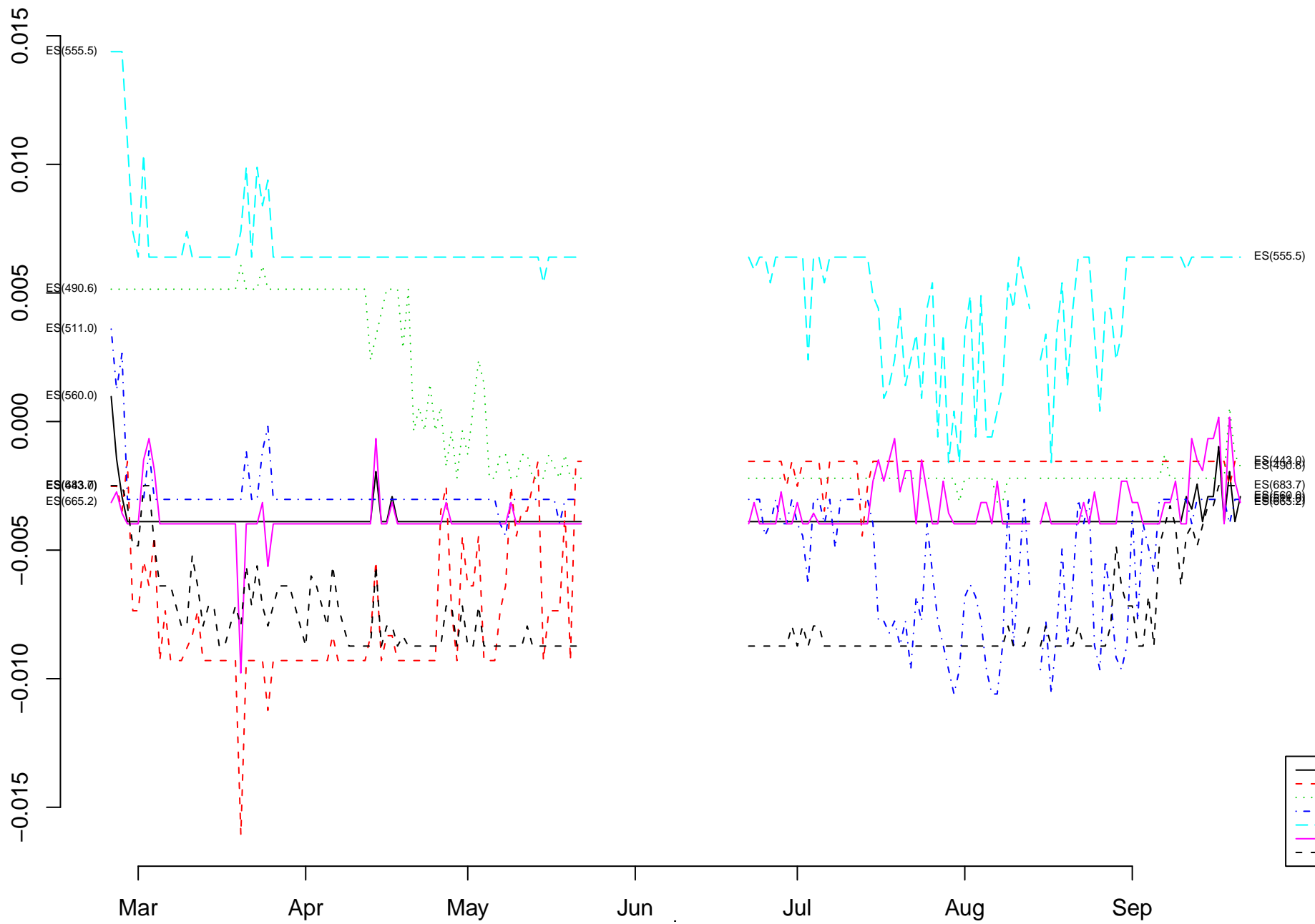
The data that are collected for several years near the BOUSSOLE site by the French weather forecast Agency, "Meteo France", and which are provided in real time on the internet, have been of great help in the day-to-day management of the monthly cruises.

Two companies have largely contributed to the BOUSSOLE project, namely the ACRI-in/Genimar company, Sophia Antipolis, France (buoy conception) and Satlantic Inc., Halifax, NS Canada (buoy centralized acquisition system and radiometers); their help is specifically acknowledged here.

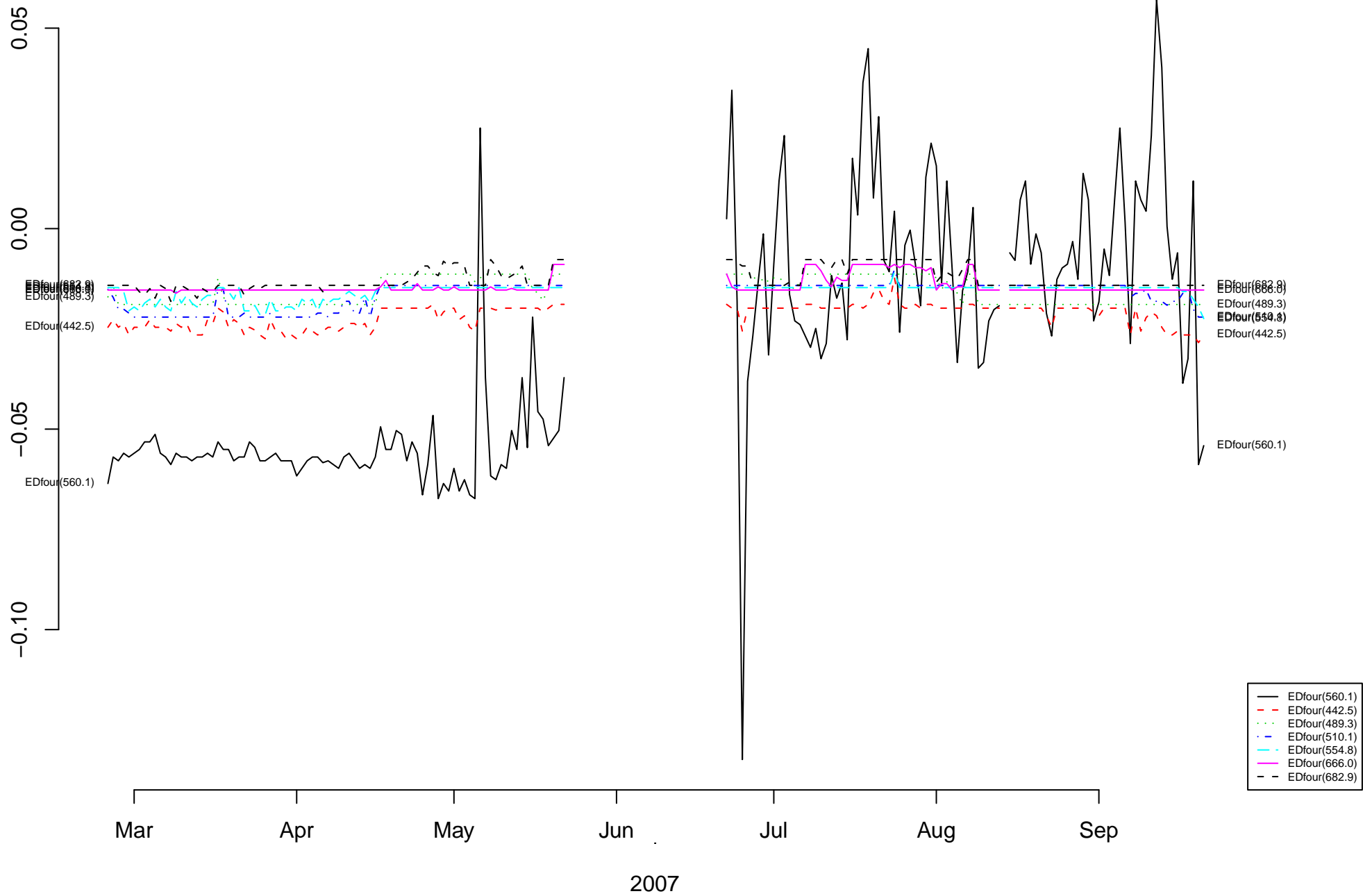
## **8. DAILY DATA COLLECTION SHEETS**

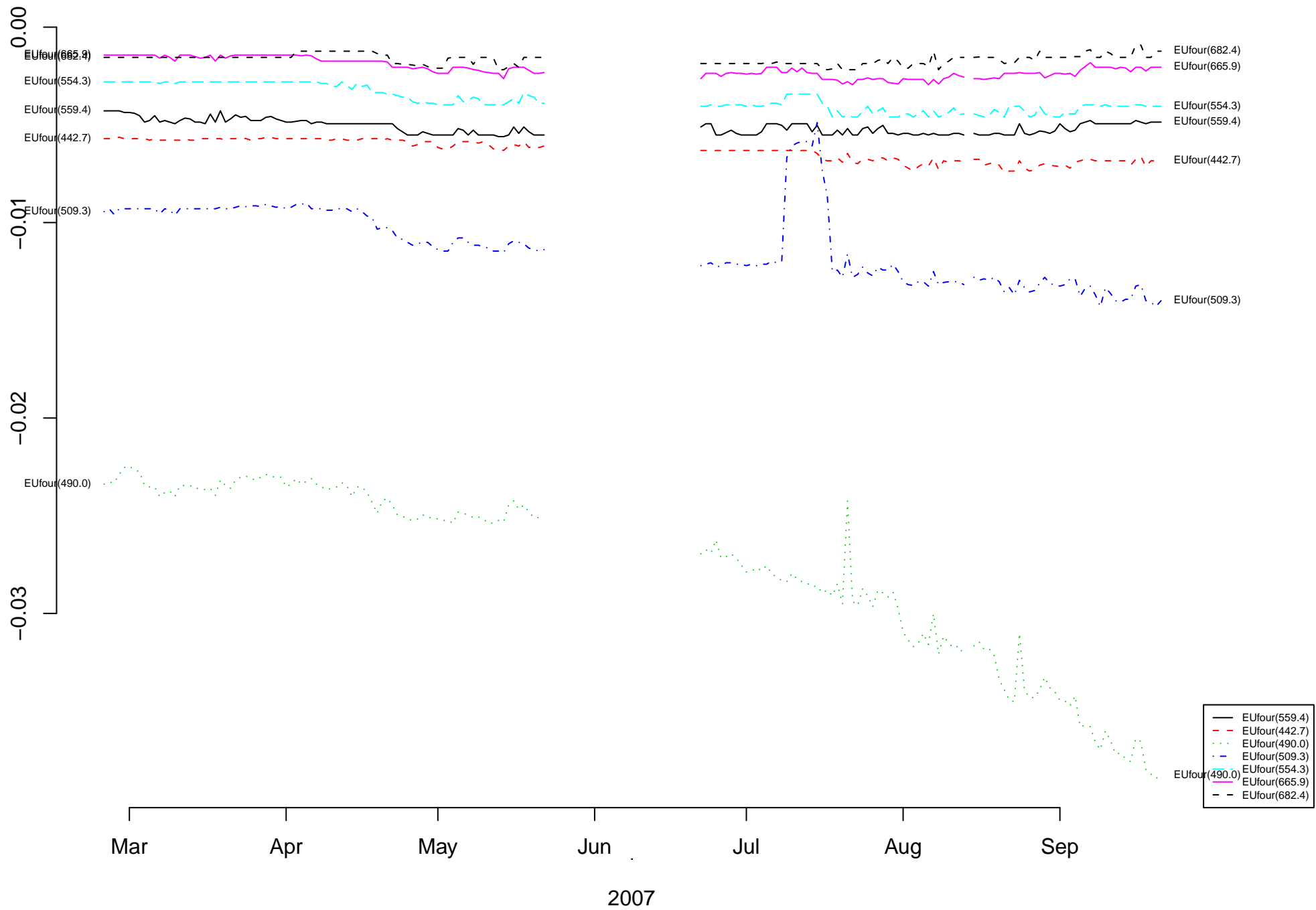
The following pages are meant to summarize the data collected each day by the buoy.

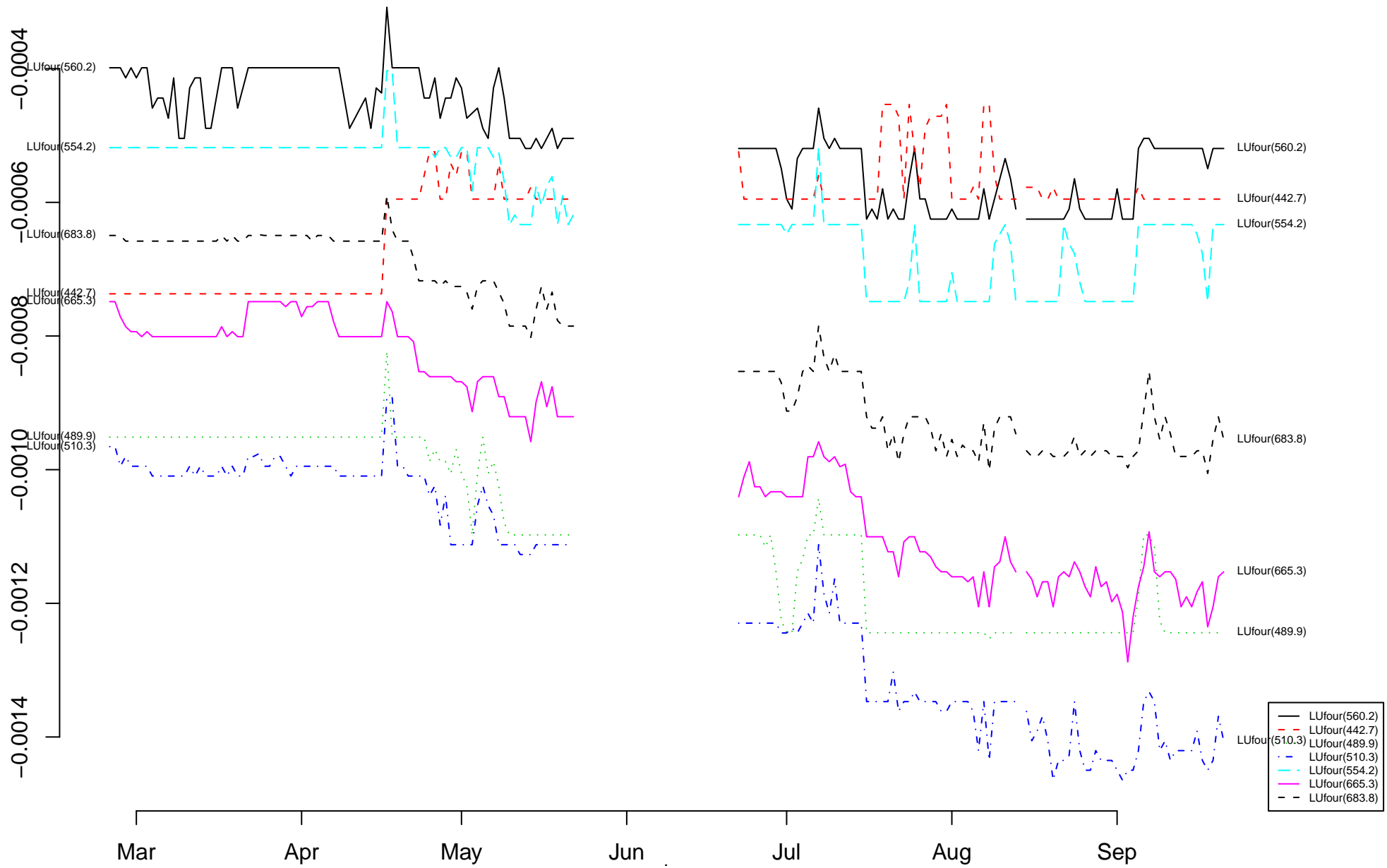




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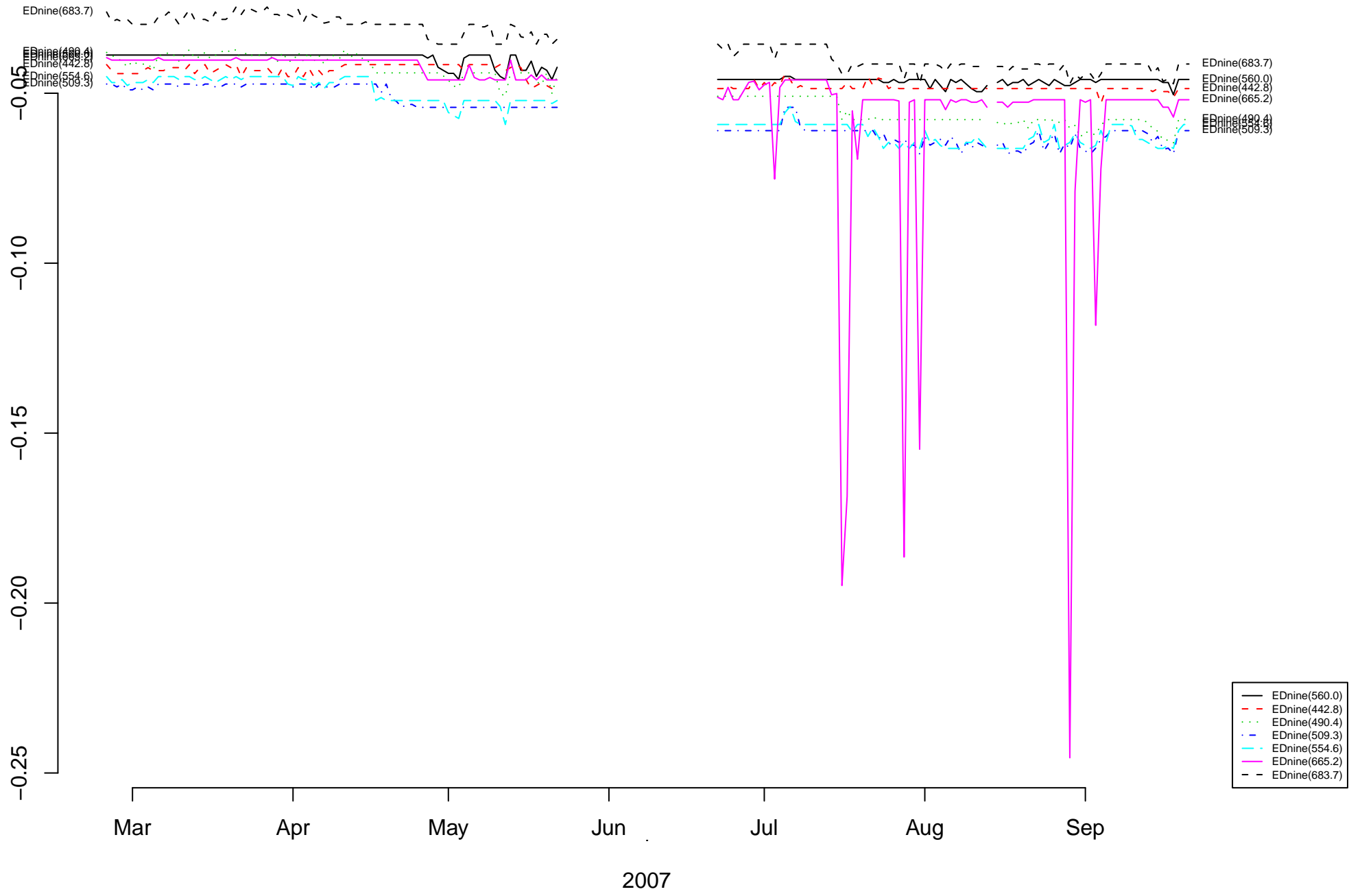


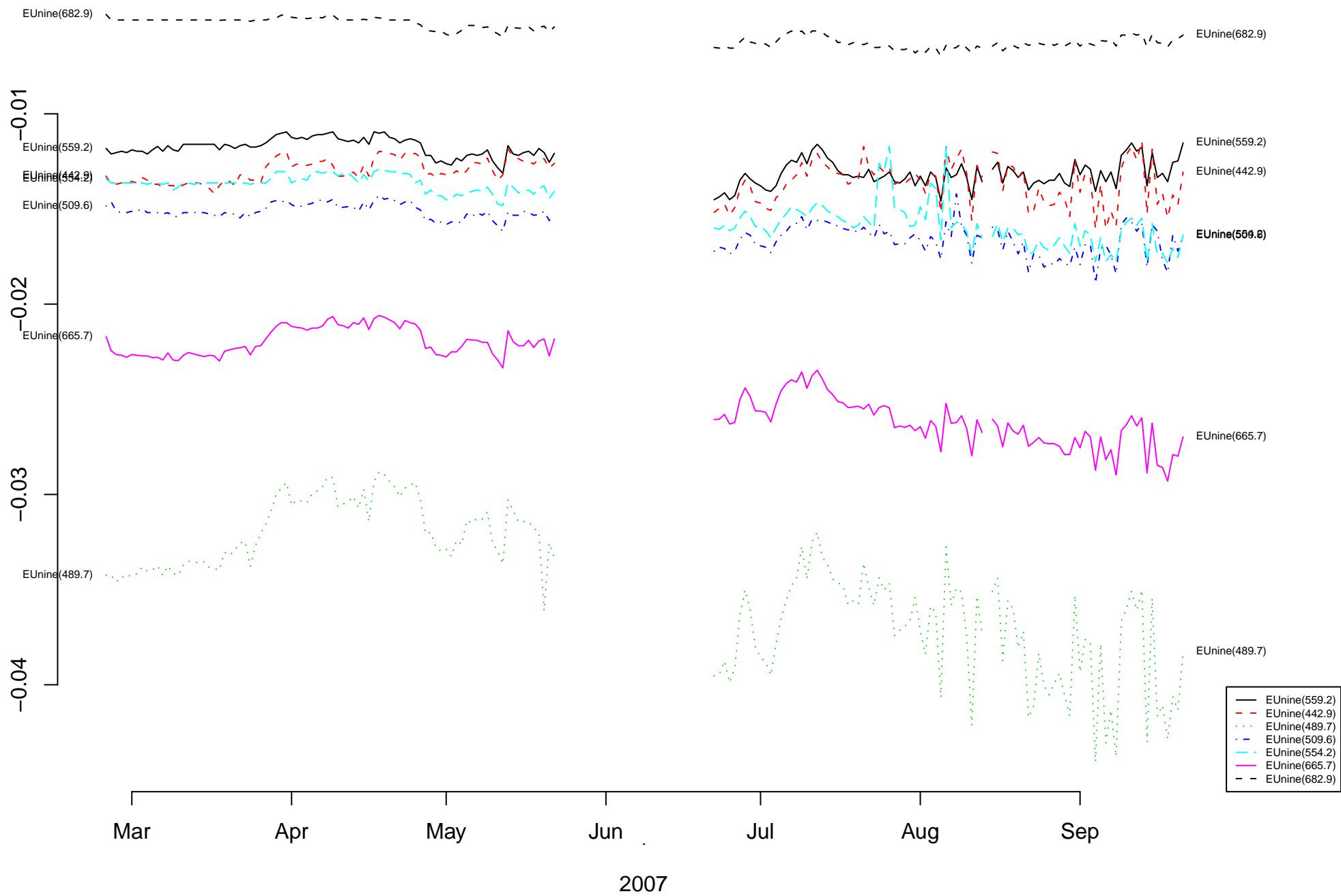


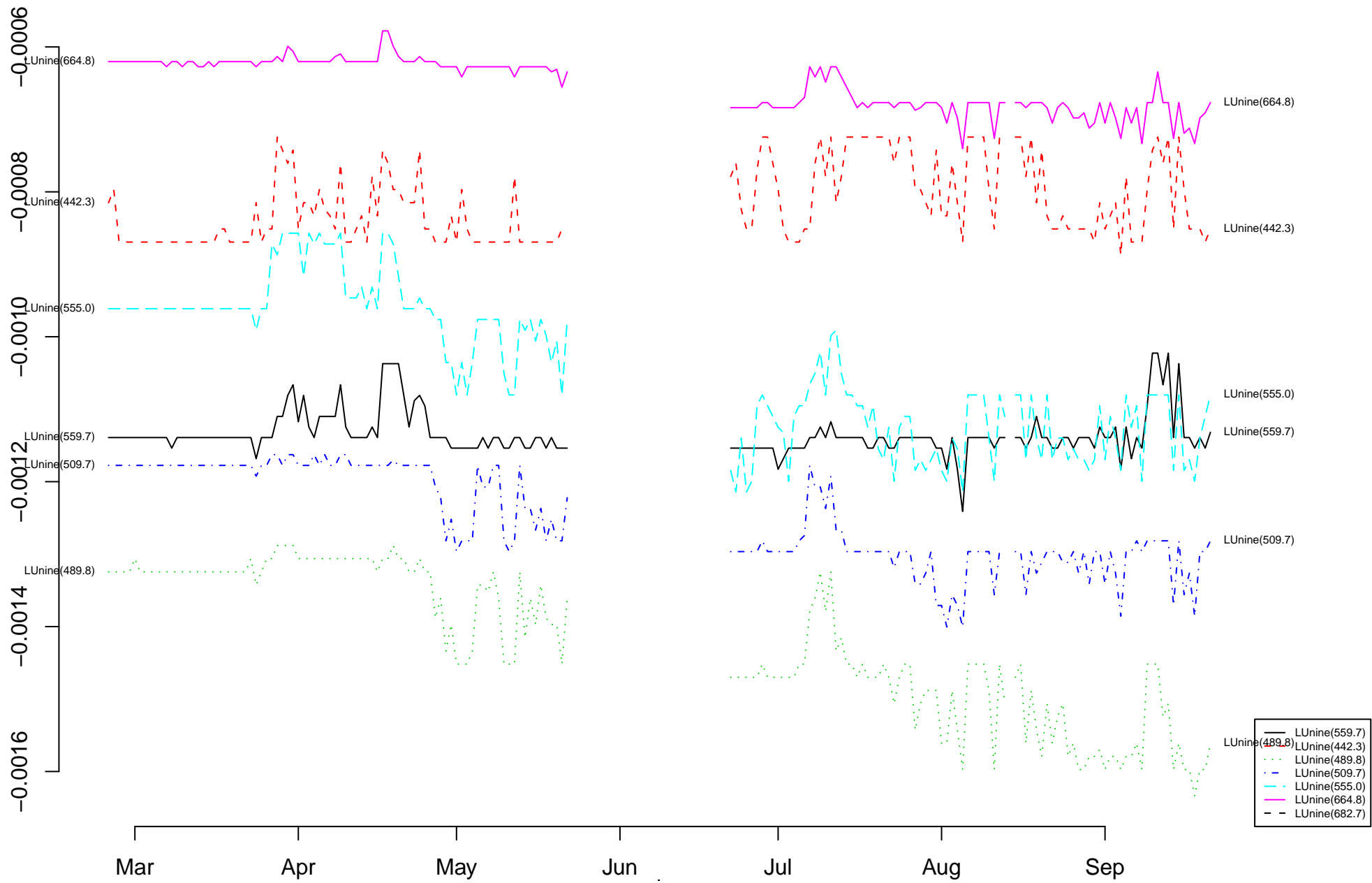


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- - LUfour(442.7)
- - LUfour(489.9)
- - LUfour(510.3)
- - LUfour(554.2)
- LUfour(665.3)
- - LUfour(683.8)







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