

MET / OCEAN Buoy



Service Observation
Observatoire Oceanologique de Banyuls
CNRS / UPMC / INSU
66650 Banyuls sur mer France

Scientific Context

Observation

Global climate changes

Scientific Objectives

DEVELOPMENT

of an AUTONOMOUS observing system
with REAL-TIME data monitoring
to improve temporal coverage
of MET/OCEAN parameters

Technical Objectives

Capability to service and repair with small qualified staff

Modularity (floater / tower)

Minimum work at sea

Useful spares

Operating Temperature Range (-20°/+50°)

12 VDC

RS-232 data acquisition

Linux

Real-time data access

Buoy System

Floater



Weight: 1.4 T

Height: 5 m

Diameter: 2.4 m

Buoyancy: 5.1 T

Tower



Modularity

Energy

Informatics / Electronics

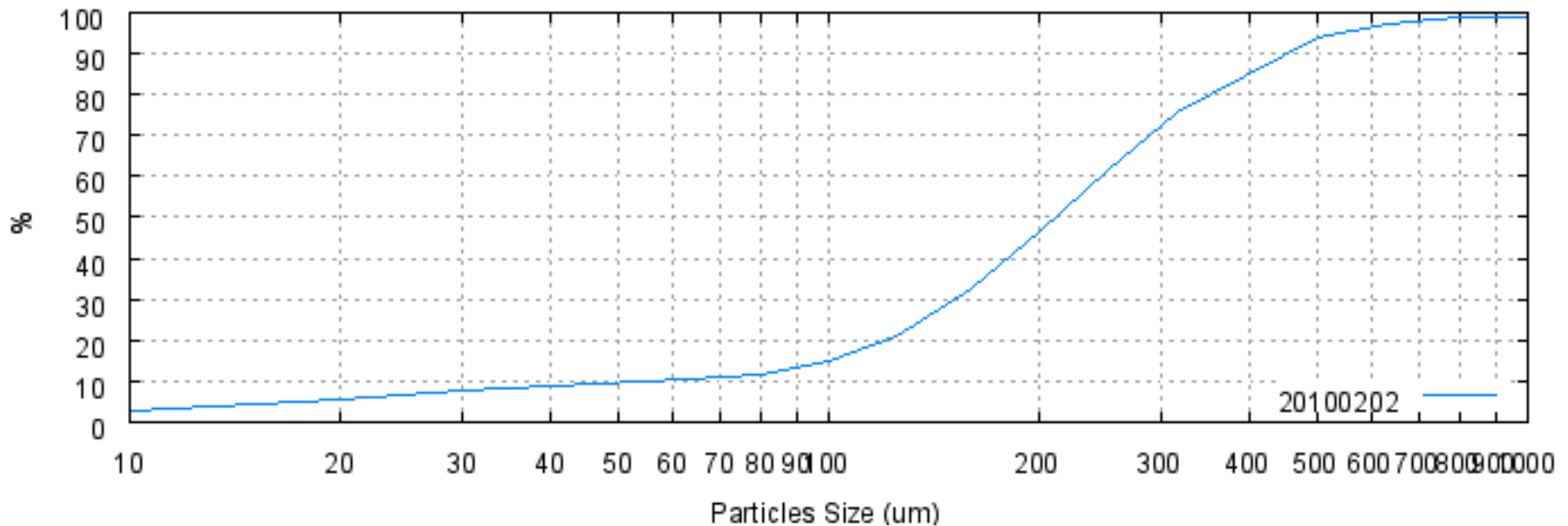
Telemetry

Sensors



Mooring

Since January 19, 2010
Position: Bay of Banyuls / mer
Latitude: 42.48853 d
Longitude: 3.14293 d
Distance to shore: 1 km
Depth: 27 m
Mooring: 170m (chain)
Anchor: 8000 kg
Sediment: sandy



Power System

400 Ah battery bank (12VDC)

4 solar panels (50 W)

Charge controller

Regulated 12VDC

for all instruments

Data System

PC104 board running Linux

Operating temperature (-40°/+70°)

Watchdog

Battery backed-up RTC

6 serial ports

1 RJ45

2 GB SD Card (OS and data storage)

Python programming language (data acquisition)

Sensors

Above Water

AIRMAR PB200



In Water

SEABIRD SBE16 CTD
(WETLABS ECO-FLNTU)



SYSTEAM WIZ



Parameters

Voltage / Current / Temperature

Uptime / CPU Load / Processes ...

Latitude / Longitude

Pitch / Roll / Heading

Wind Speed / Direction

Air Temperature / Atmospheric Pressure

Pressure / Temperature / Salinity / Fluo / Turbidity /
Voltage

NO3 / NO2 / NH4 / PO4

Telemetry System

WIFI (802.11b)

Buoy: omni-directional antenna

Shore: directional antenna

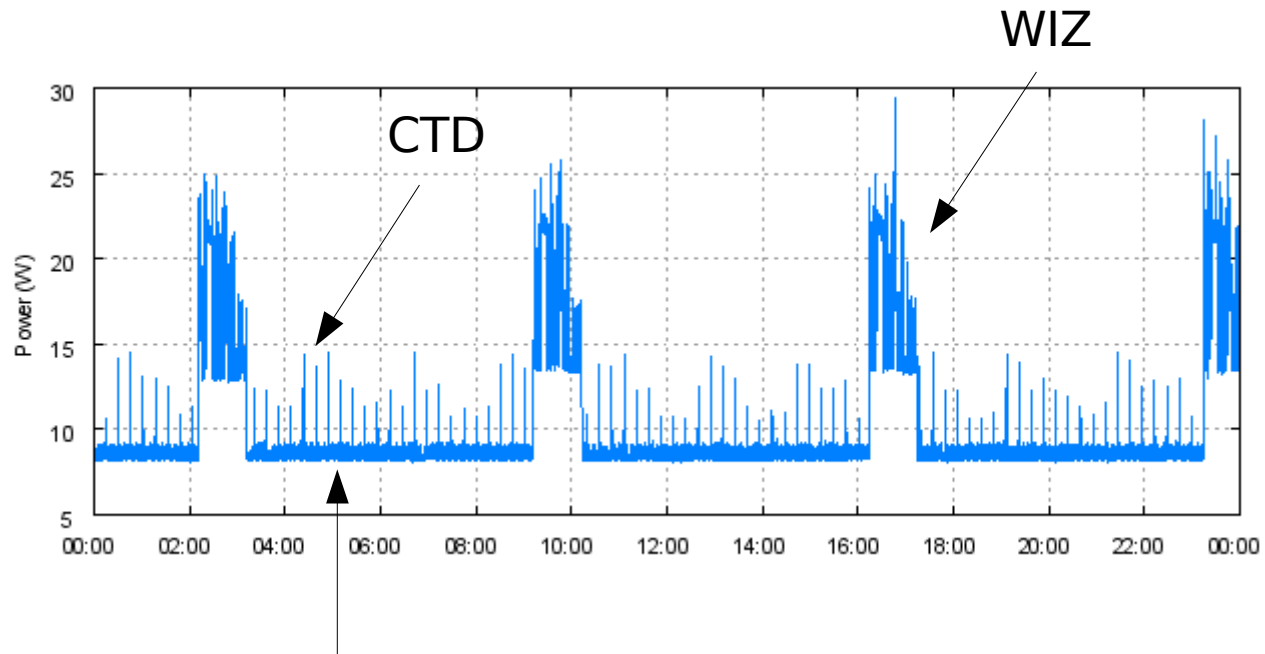
GSM

Buoy: omni-directional antenna

SMS reports / Alerts on threshold values

```
OOB SERVOB BUOY1  
WIF1,200901102,072346,0,0  
*REG1,200901102,072517,11.73,-0.7  
GPS1,200901102,072527,42.4803833,3.1367
```


Power Consumption



PC104 + AIRMAR + WIFI + GSM

Total load: 241 Wh / day

Theoric autonomy without recharge: 16 days

Shore System

Computer running Linux

Remote control (ssh)

Data download every 10 min (rsync over ssh)

Data storage in database (MySQL)

Time series plots (GnUpPlot)

Web page update (PHP)

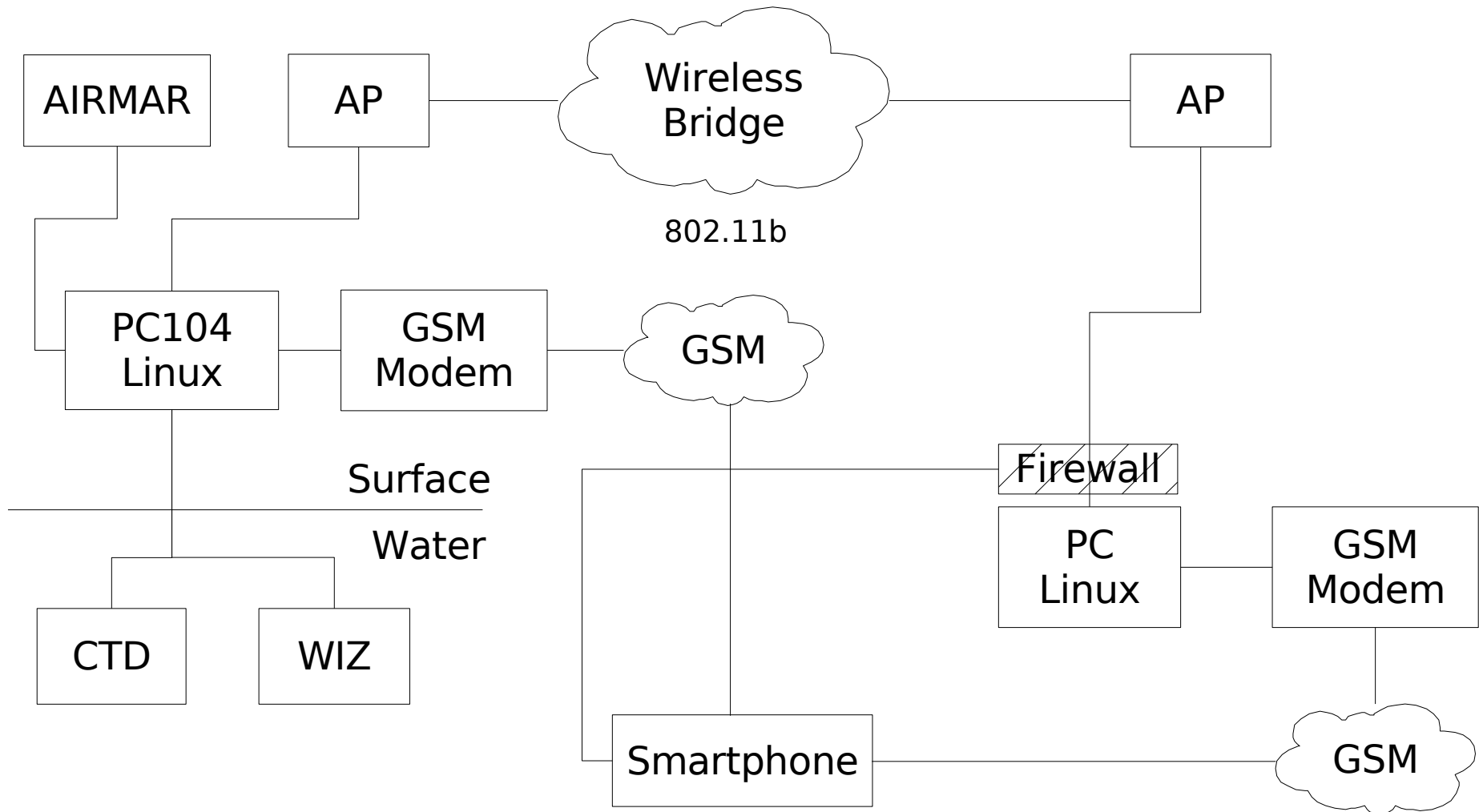
SMS and Email alerts on threshold values

Data export in CSV files (Python)

Block Diagram

Buoy Station

Shore Station



Recorded Events

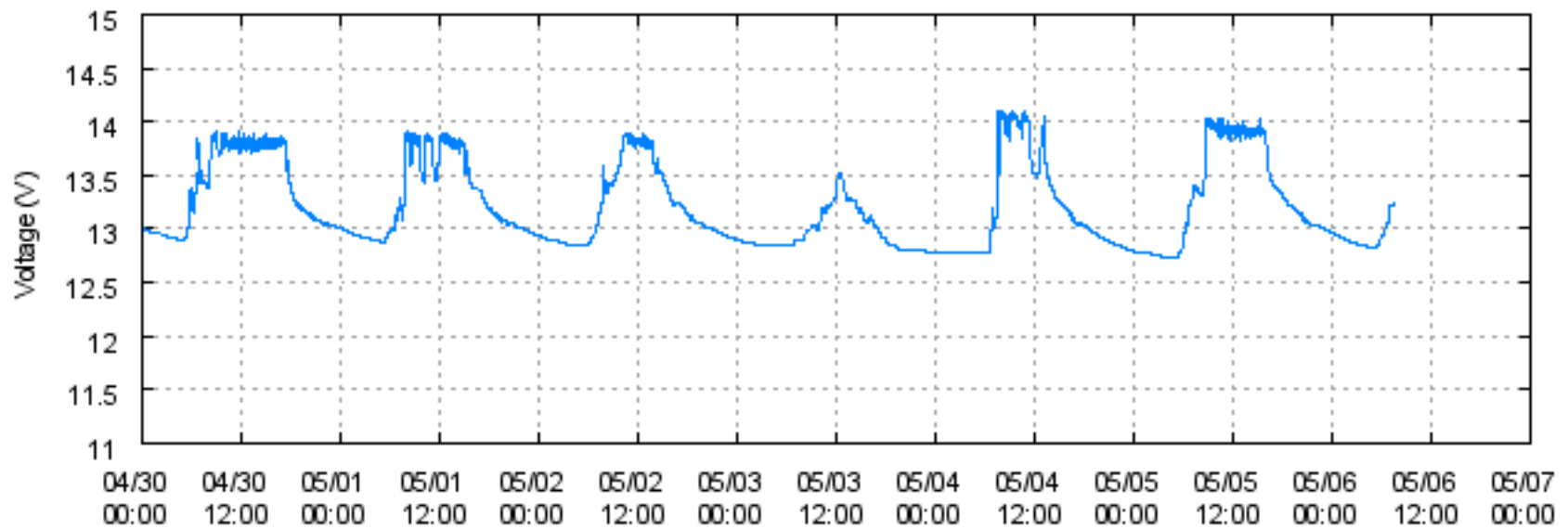
Rough winds > 120 km/h (NW)

Rough waves > 8 m (E)

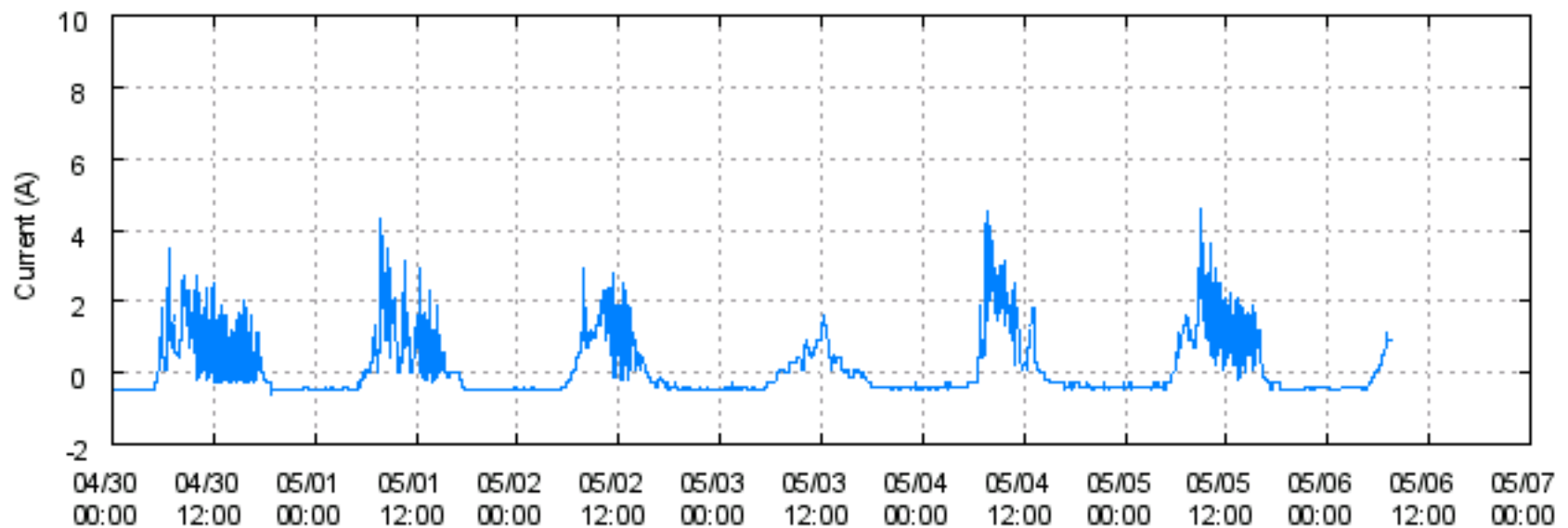
Heavy snow

Heavy rain with flood

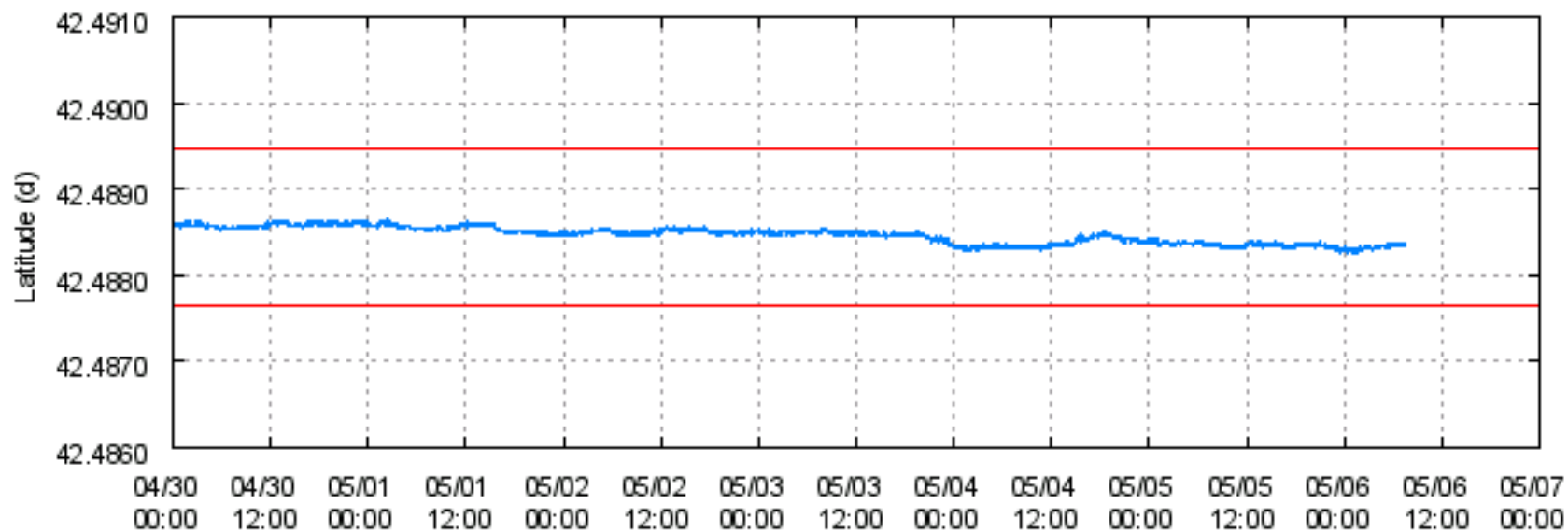
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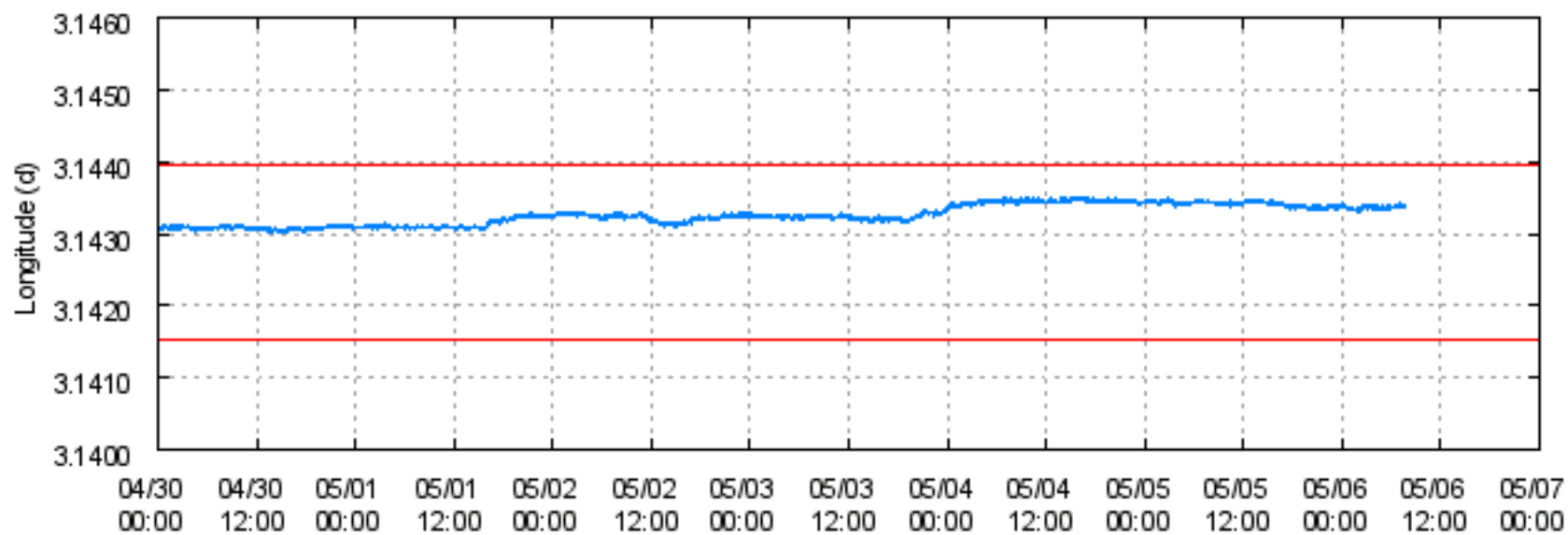
min=-0.6 max=4.6



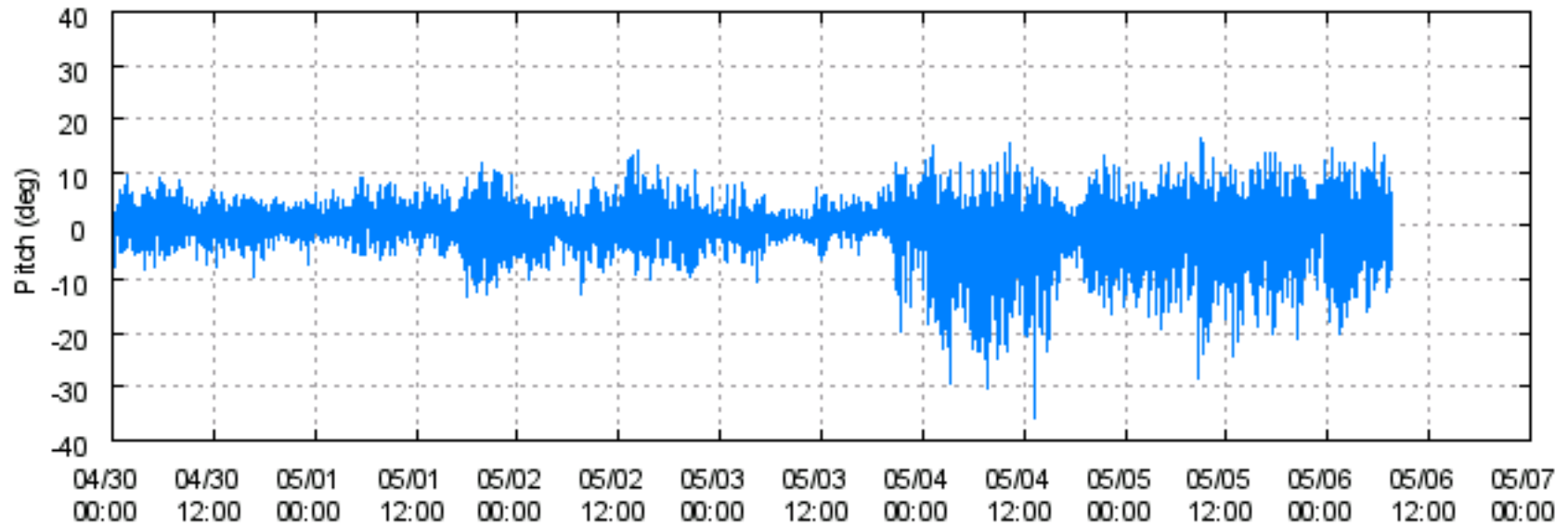
min=42.48827 max=42.48865



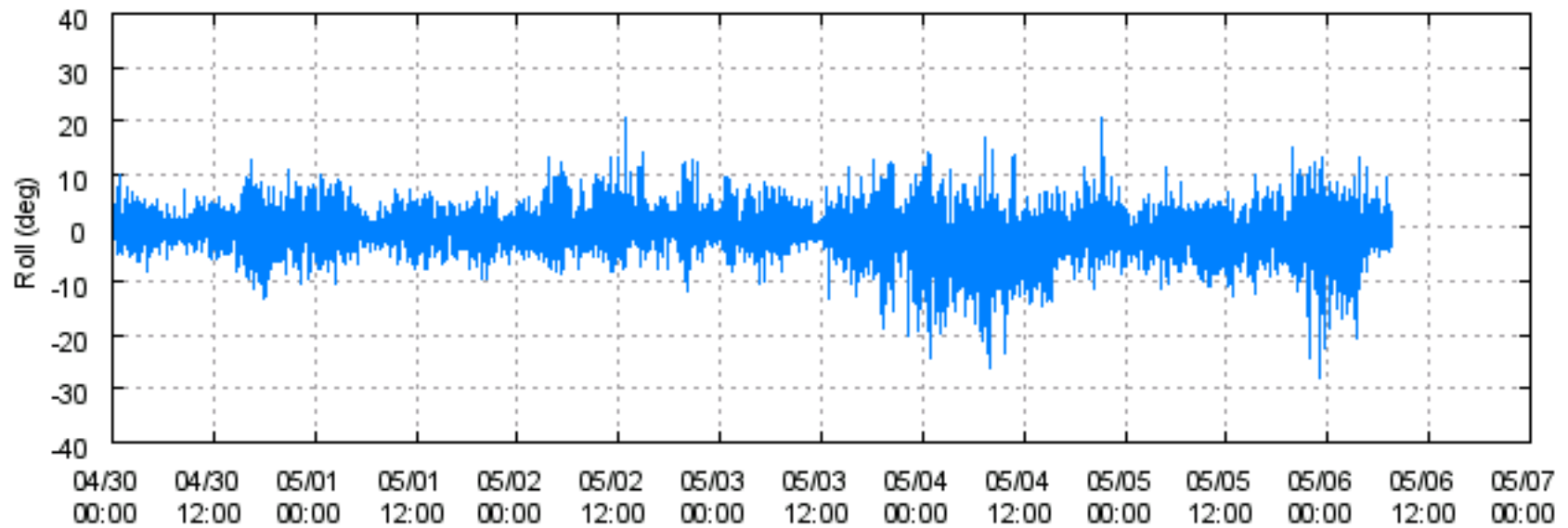
min=3.14302 max=3.14352



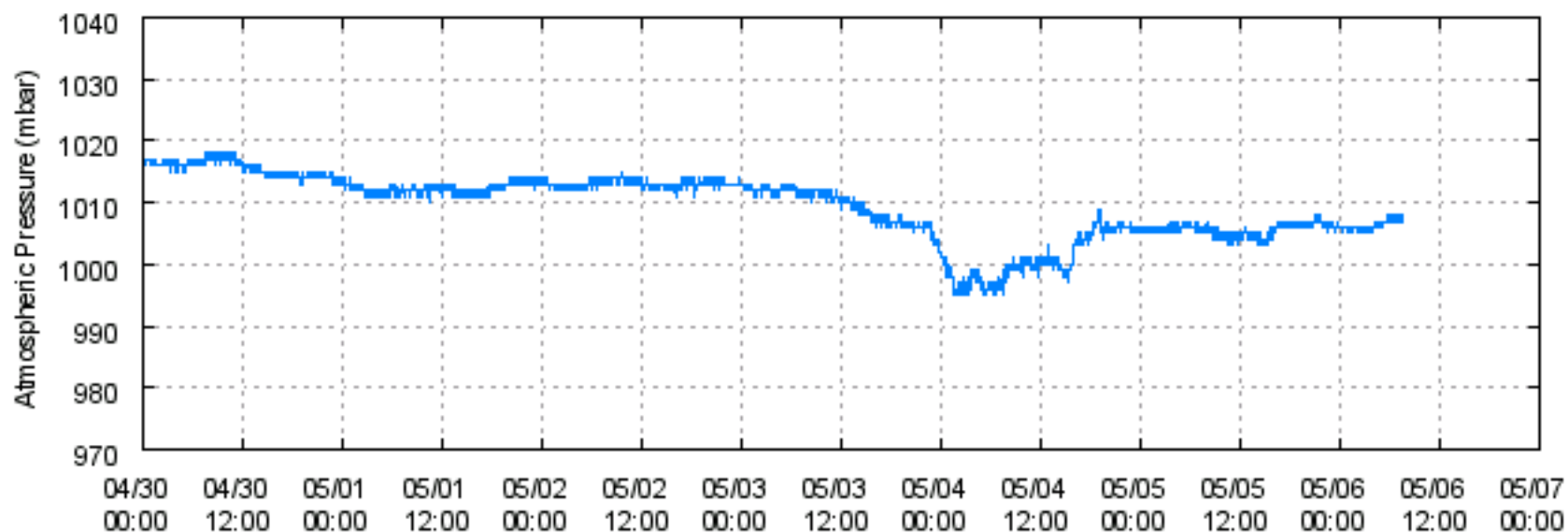
min=-36.0 max=16.3



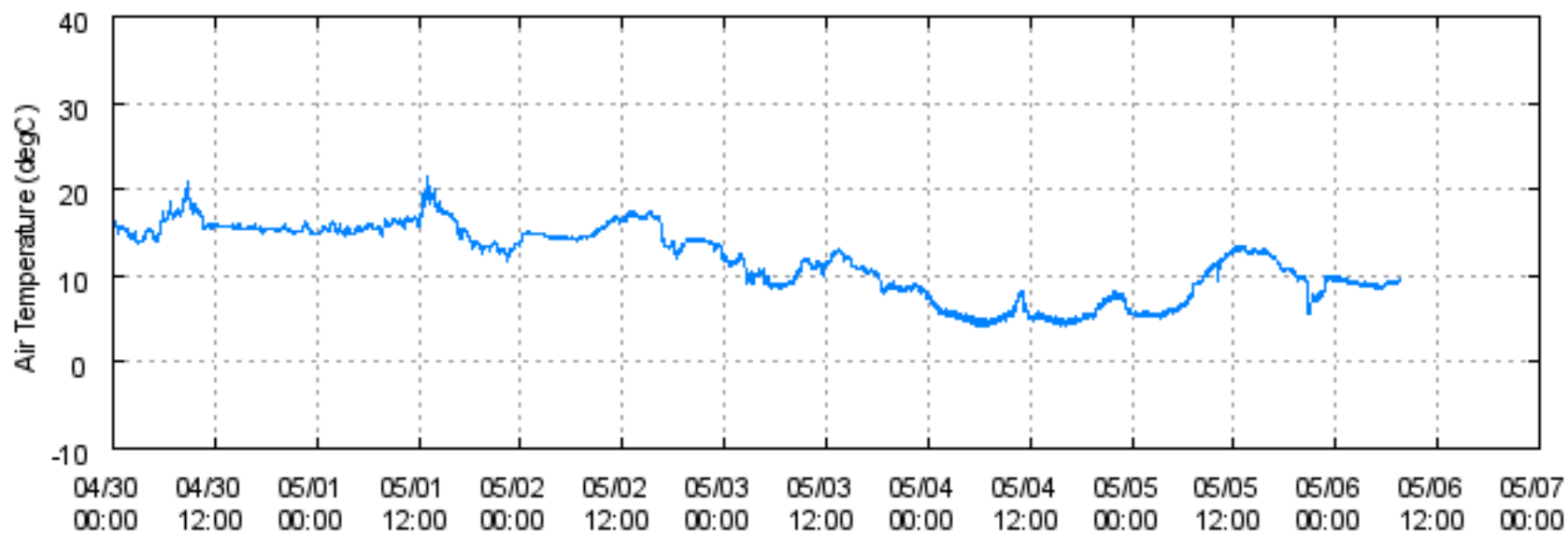
min=-27.8 max=20.6



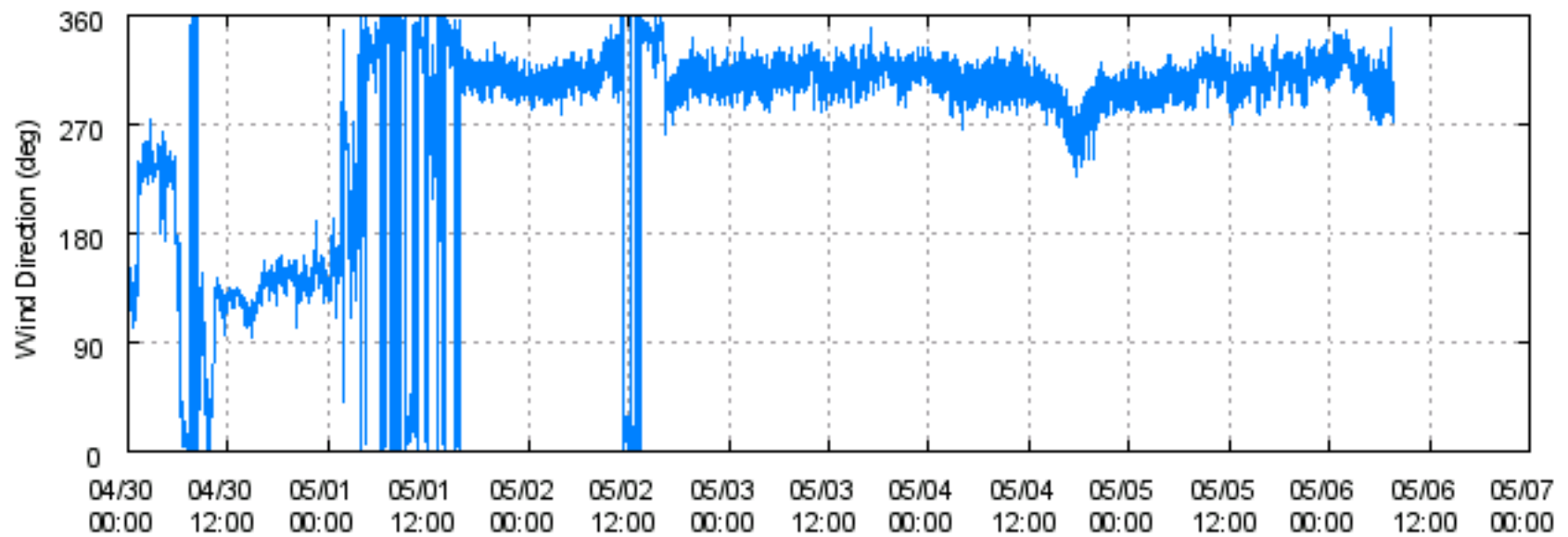
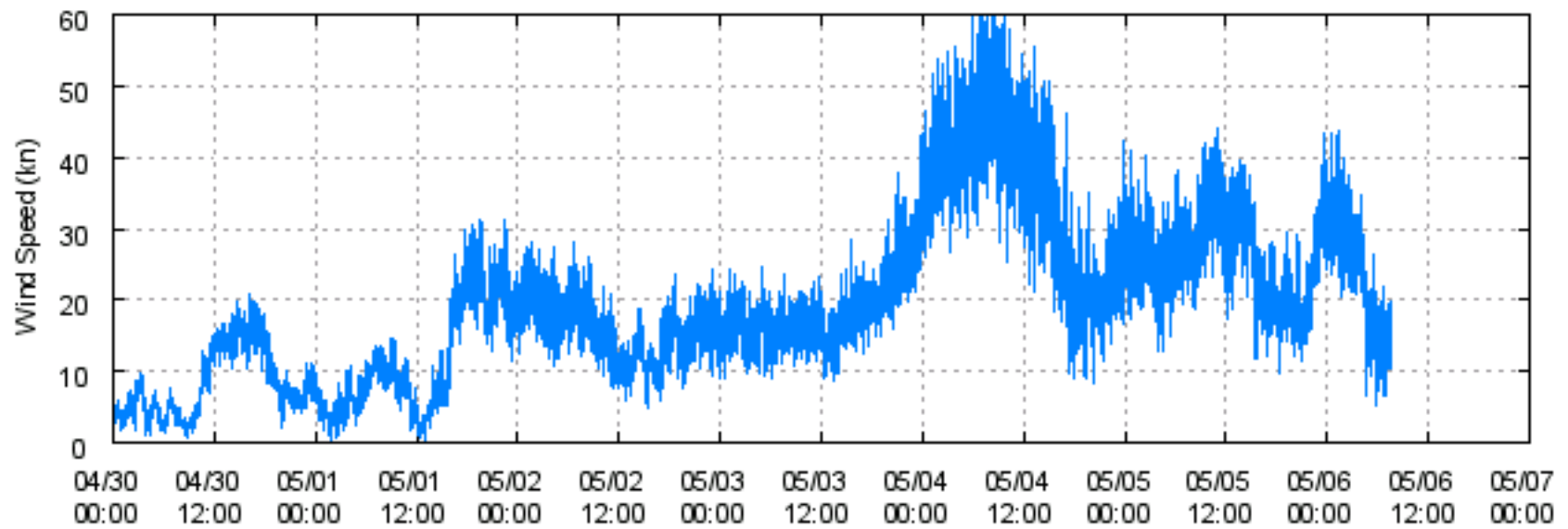
min=995 max=1018



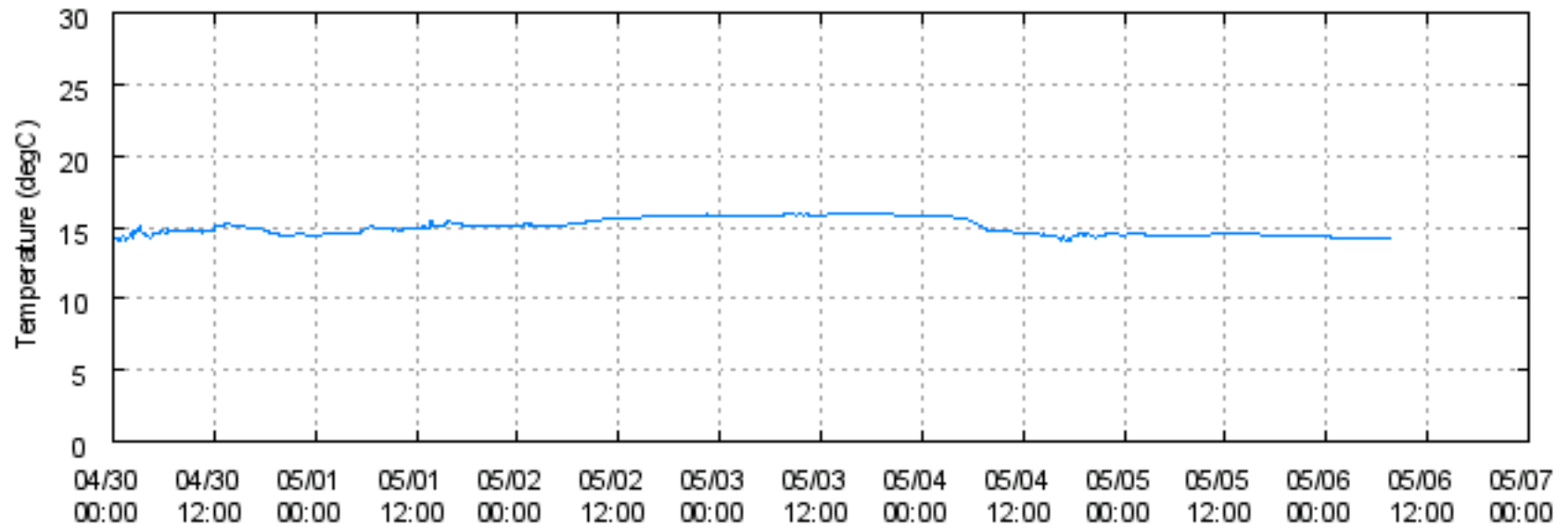
min=4.2 max=21.5



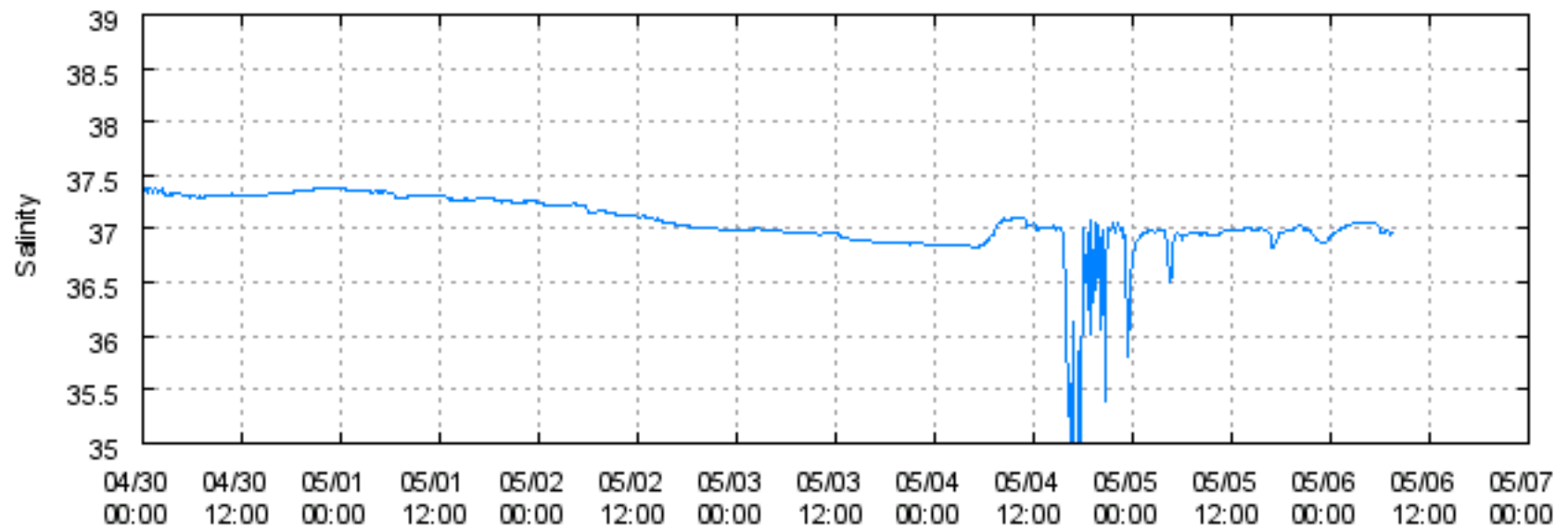
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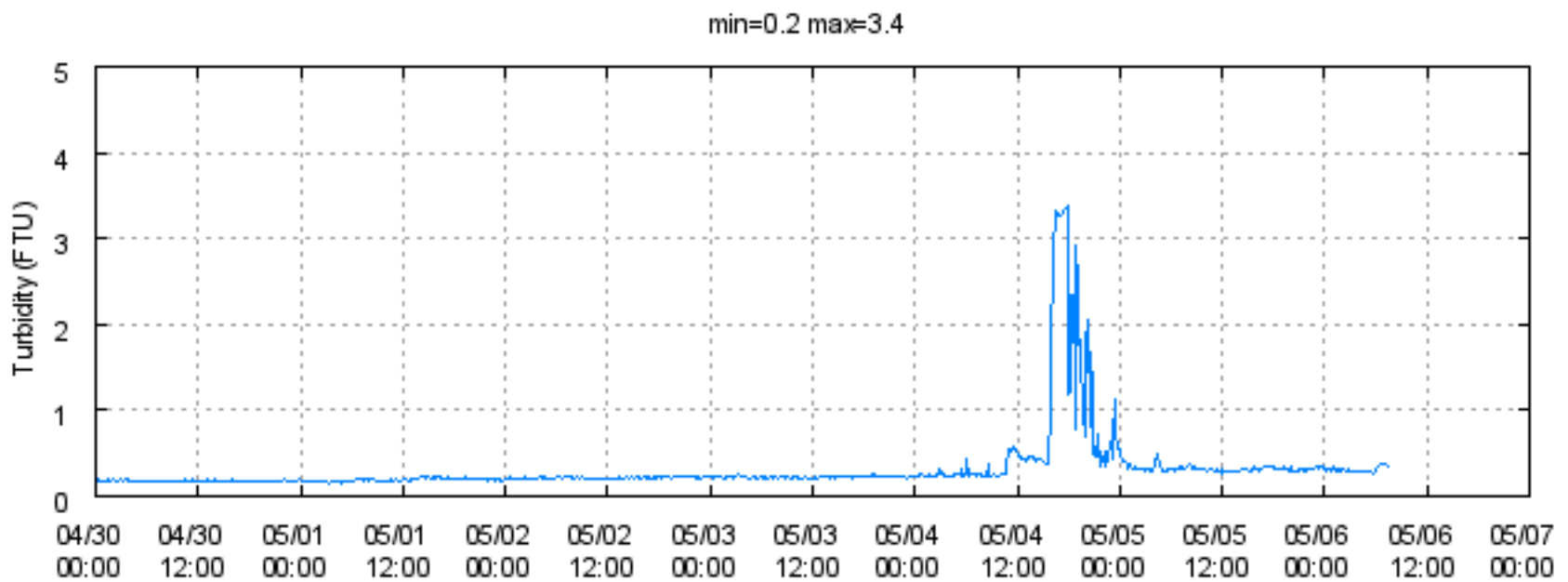
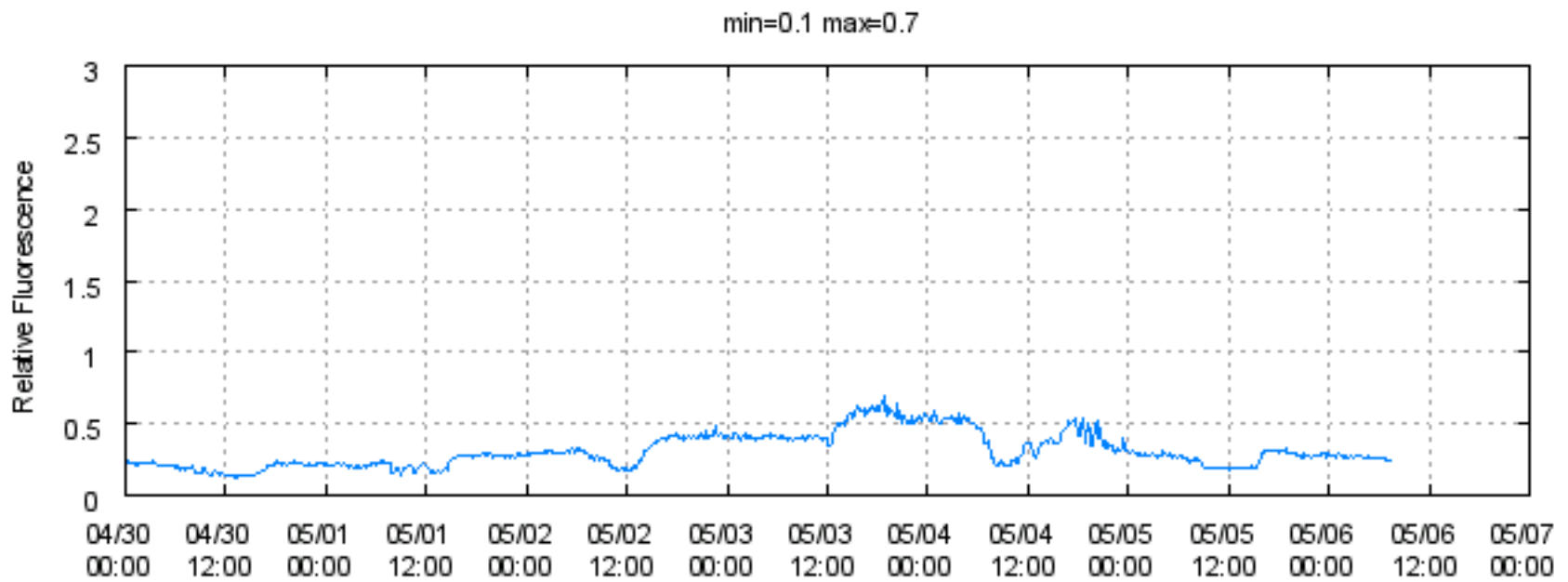


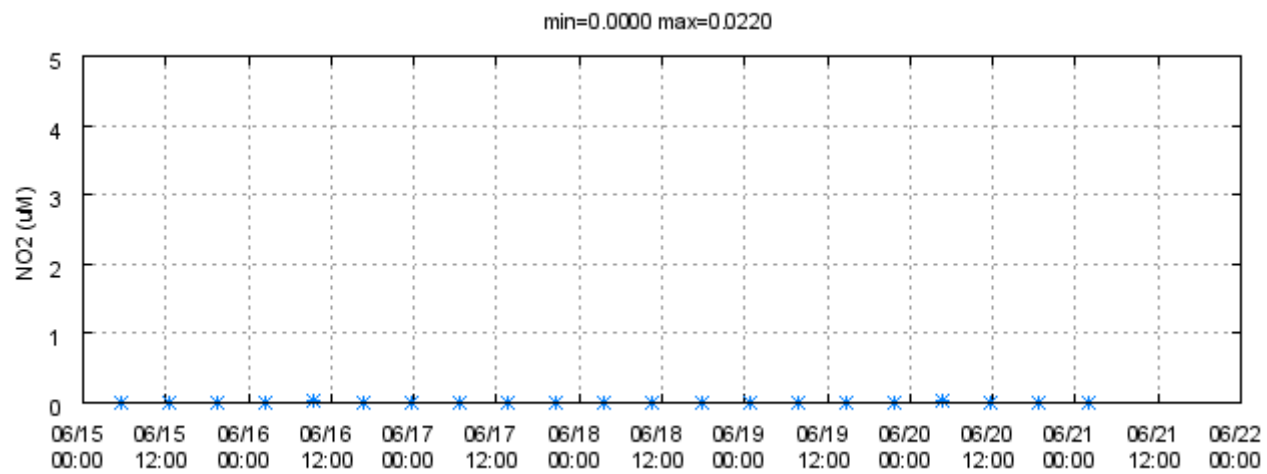
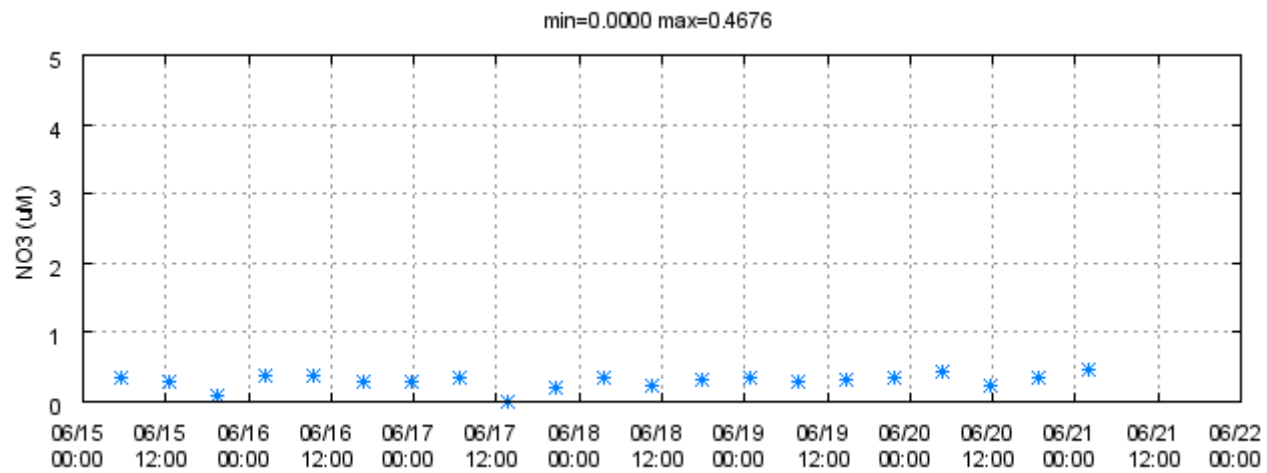
min=14.0 max=15.9



min=34.5 max=37.4







Web site: <http://observation.obs-banyuls.fr/buoy1>

OOB-SERVOB-BUOY1 - Konqueror

Location Edit View Go Bookmarks Tools Settings Window Help

Location: <http://observation.obs-banyuls.fr/buoy1/main.php> Google Search

OOB-SERVOB-METEO1 OOB-SERVOB-BUOY1 OOB-SERVOB-WIFI1 OOB-SERVOB-METEO1 OOB-SERVOB-BUOY1

Service	oob-servob	
ID	buoy1	
Latitude	42.48853	d
Longitude	3.14293	d
Depth	27	m
Sediment	sandy	
Mooring	170	m
Anchor	8000	kg
Activity	t	y/n/t

Data are raw and have not yet been validated

REGULATOR

UTC Date	20100503	yyyymmdd	
UTC Time	054347	hhmmss	
Records	485876		
Sampling	60	s	
Voltage	12.8	v	
Current	-0.3	a	
Temperature	16	degc	

Click on the graph icon to see time series plots of that observation

COMPUTER

Future

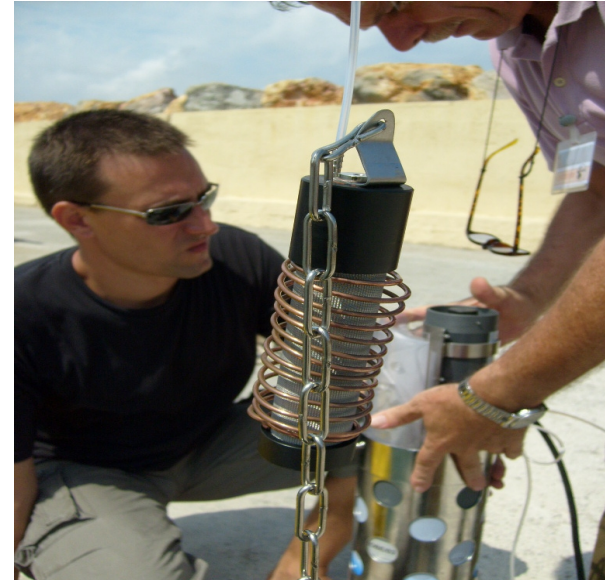
Continue development

Power savings

Long distance telemetry (iridium ?)

Acoustic communication with seabed

Acknowledgements



Thank you for your attention

Web site

<http://observation.obs-banyuls.fr>

<http://observation.obs-banyuls.fr/buoy1>

Please feel free to contact us:

Laurent Zudaire

laurent.zudaire@obs-banyuls.fr

Renaud Vuillemin

renaud.vuillemin@obs-banyuls.fr

Specifications

Accuracy
Resolution