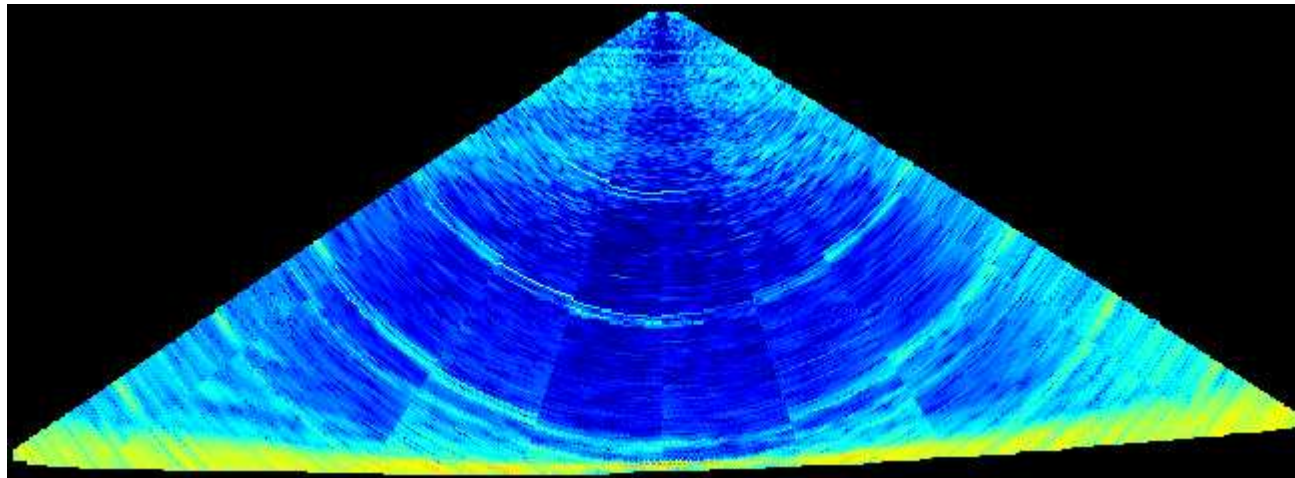


Synchronizing unit O.S.E.A

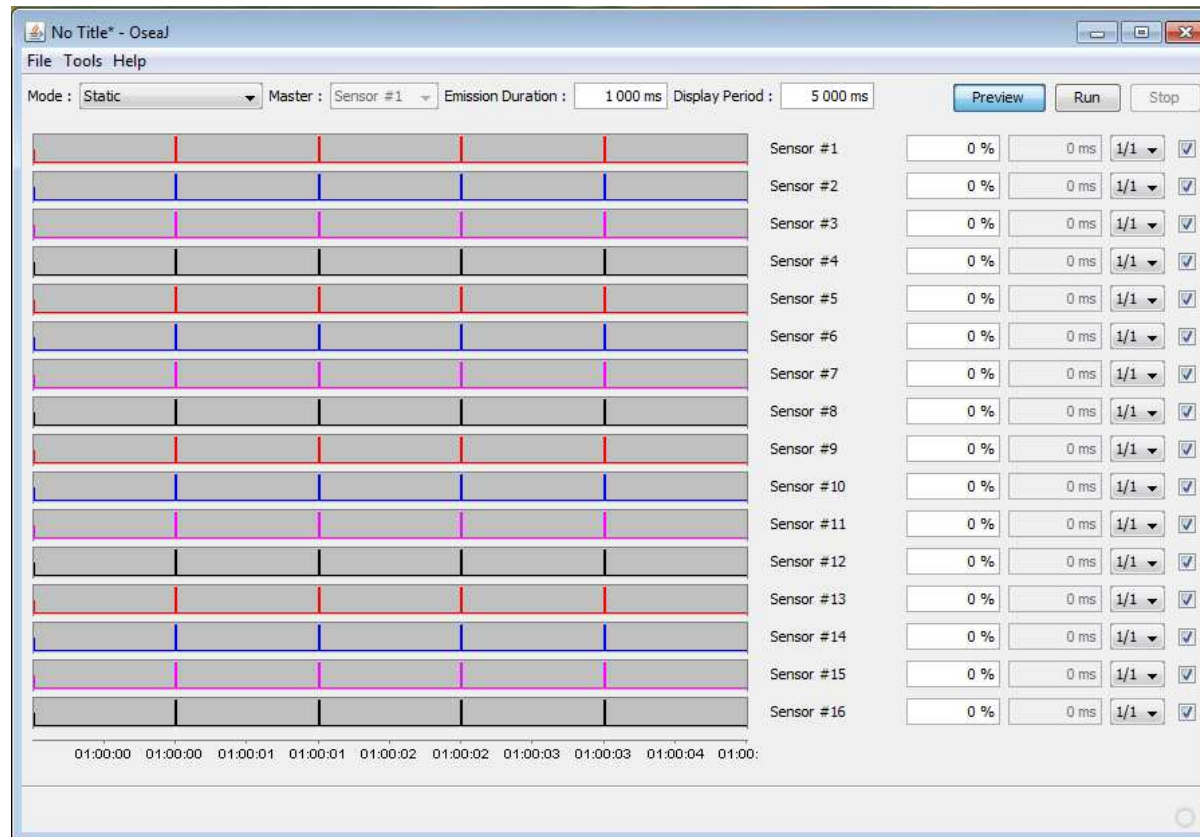
H. Floc'h, C.Marfia, G. Clodic



O.S.E.A (Outil de Synchronisation des Equipements Acoustiques) is a tool designed for the research vessels equipped with many different sonars: multibeam echosounders, single beam echosounders, Acoustic Doppler Current Profilers, Subbottom profilers....



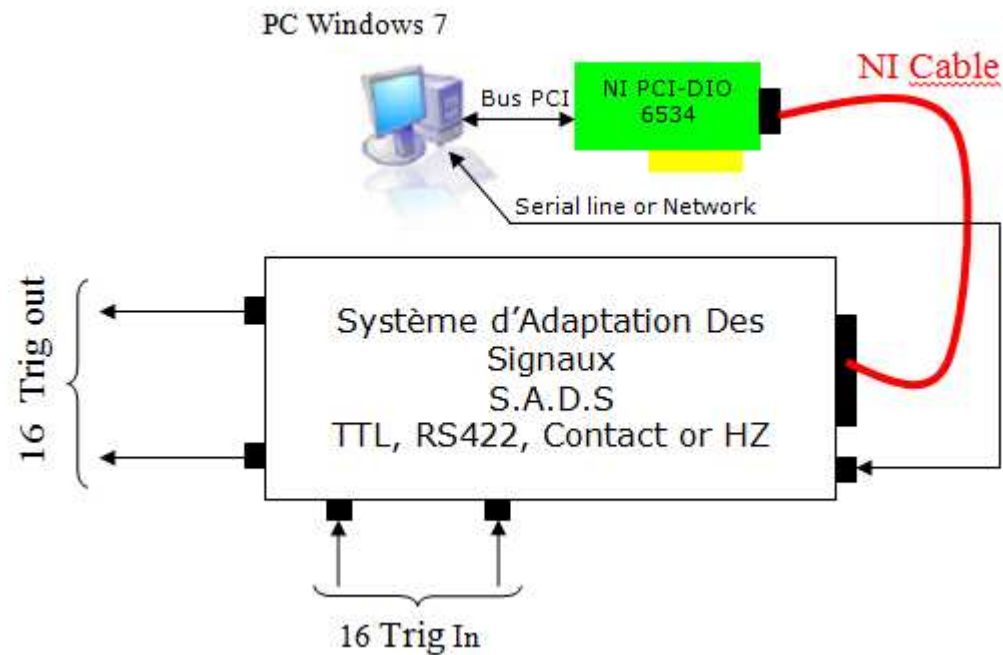
O.S.E.A provides highly configurable timing of pinging of different sounders in order to avoid interferences.



OSEA system consists of three main components :

A workstation PC (Windows 7) containing an interface board (32 input/output) and running OSEA software.

- **One interface board 32 input/output from National Instruments.**
- **System Adaptation of Signals (SADS) that interfaces to the different echo sounders (up to 16). The signal level of the input/output can be either TTL, RS422, Contact, or high impedance.**

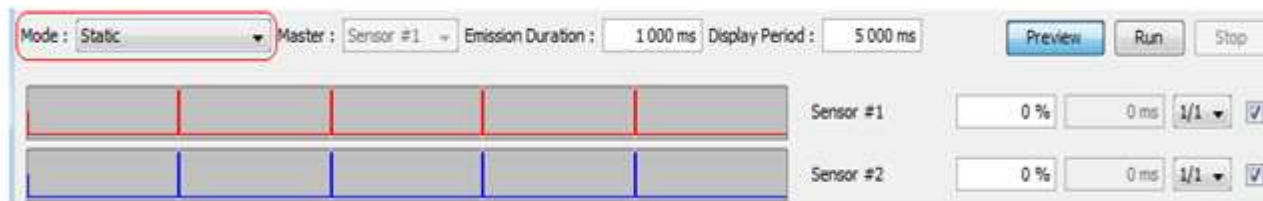


Operation : OSEA can work in two different ways :

OSEA acts as a master and controls pinging of each echosounder: period, delay...

OSEA acts as a slave : one sounder is defined as master and OSEA controls the sequence of the different sounders: period , delay relative to the master sounder.

Static mode : delays are settled in mseconds



Dynamic mode: delays are a percentage of the period of the master



Dynamic mode with sounding : Osea reads the depth on the network and use for the slave sounders values defined in a table.

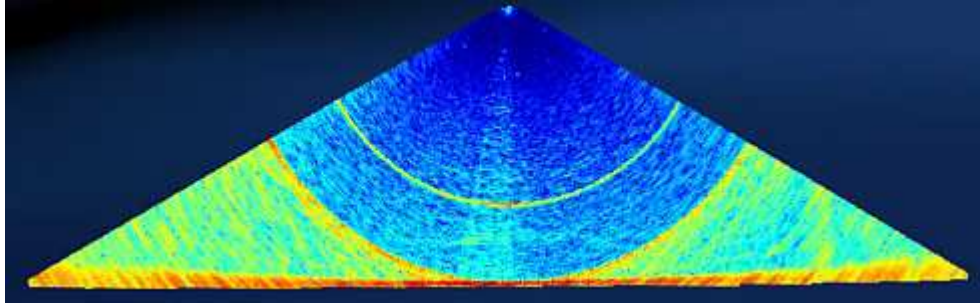
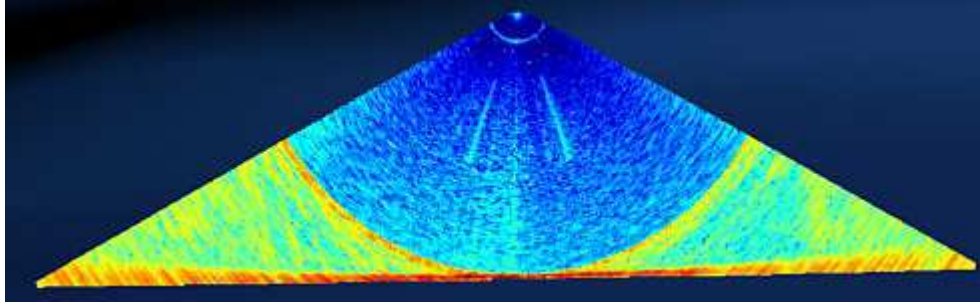
Hardware

All the inputs and the outputs of the SADS are opto isolated and configurable to different level: TTL, RS422, dry contact , High Impedance.

A Led for each sounders on the front panel indicate by its colour its status, and indicate which channel is working as master.

All the input and output are BNC connectors isolated from the ground.



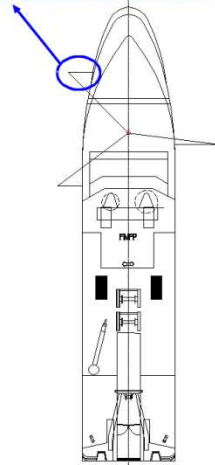
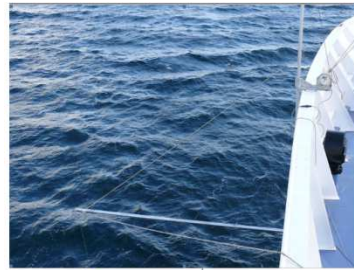


Calibration device for echo sounders

H. Floch, S. Duduyer

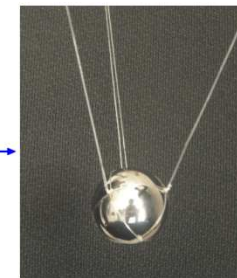
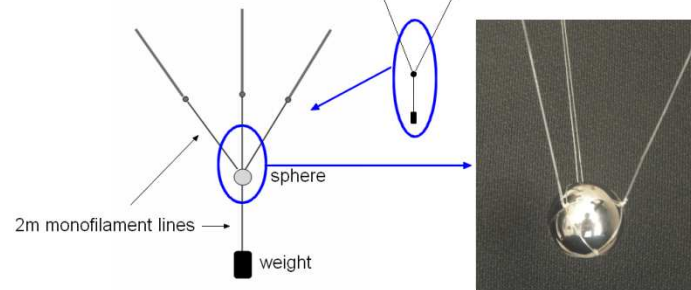
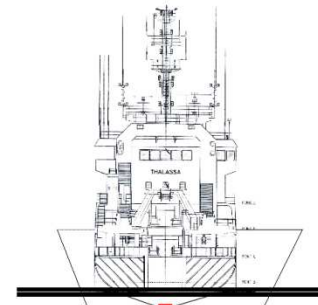


- ✓ The fisheries acoustics echo sounders and scientific multibeam echo sounders need frequent calibration. This is done by positioning reference targets (small metal sphere, weight less than 5 kg) suspended in three points, two on one side of the vessel and one on the other side, forming a triangle with the transducers in the center.



Top view

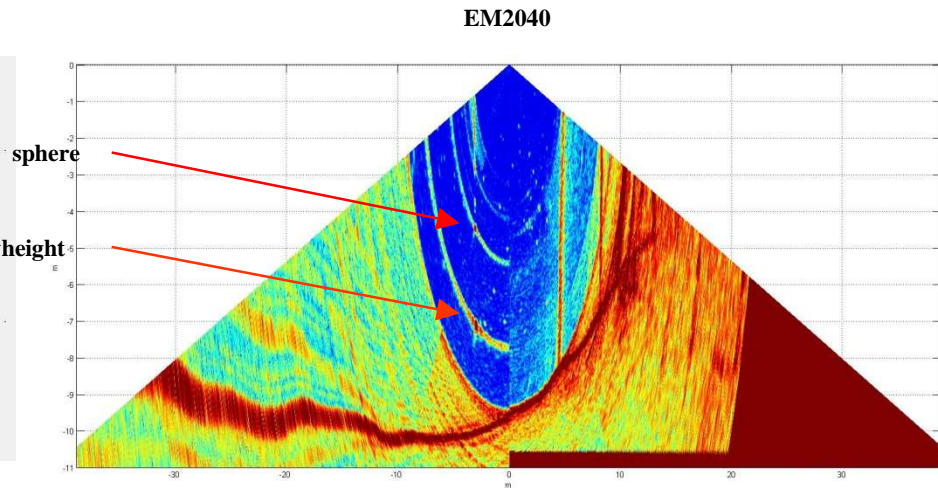
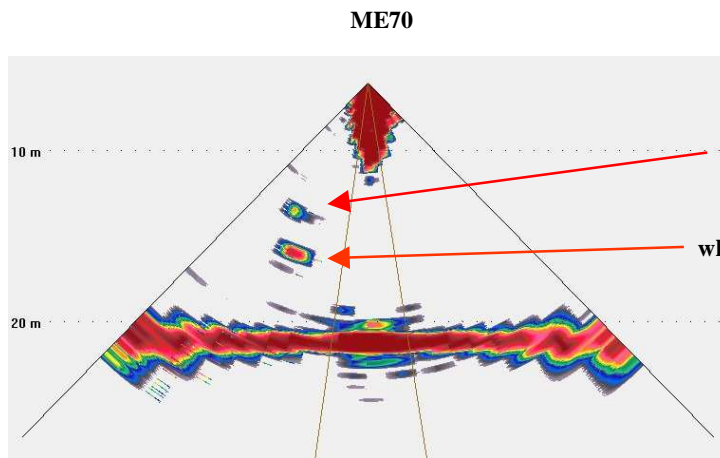
Front view



✓ Example of standard spheres



✓ Echograms



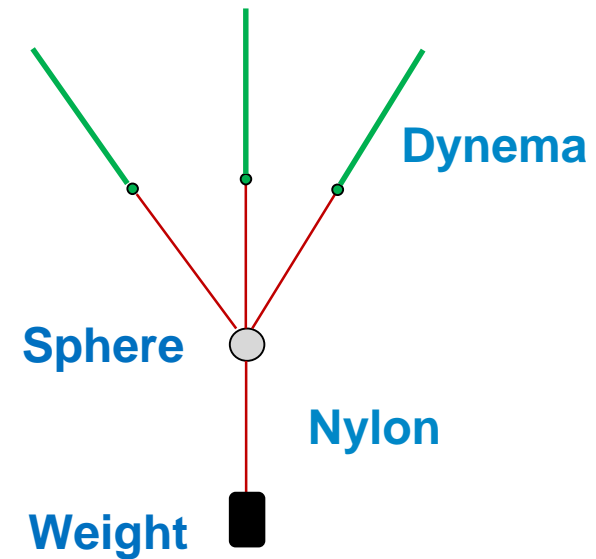
The calibration device is composed of 2 parts :

An hardware part, fixed on the ship, composed of :

- ✓ 3 aluminium booms equipped with a Dynema rope,
- ✓ a standard sphere
- ✓ a weight of 2-3 kg,
- ✓ 3 electric step motors,
- ✓ 1 control box with one power supply for each motor, one driver per motor and two fans.

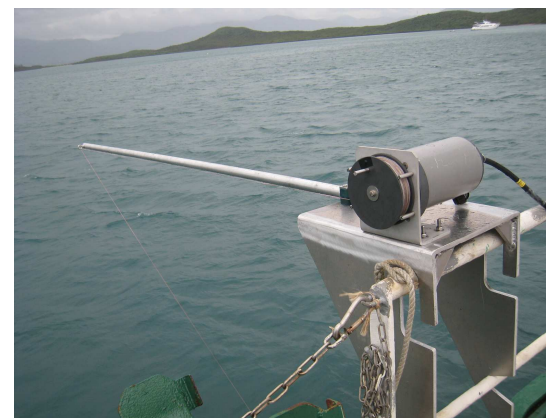
A software part :

- ✓ The Bille software which controls these 3 step motors, and so, moves the standard sphere where needed for calibration. This software runs on a PC.





Control box



Examples of sitting of step motors



Examples of booms

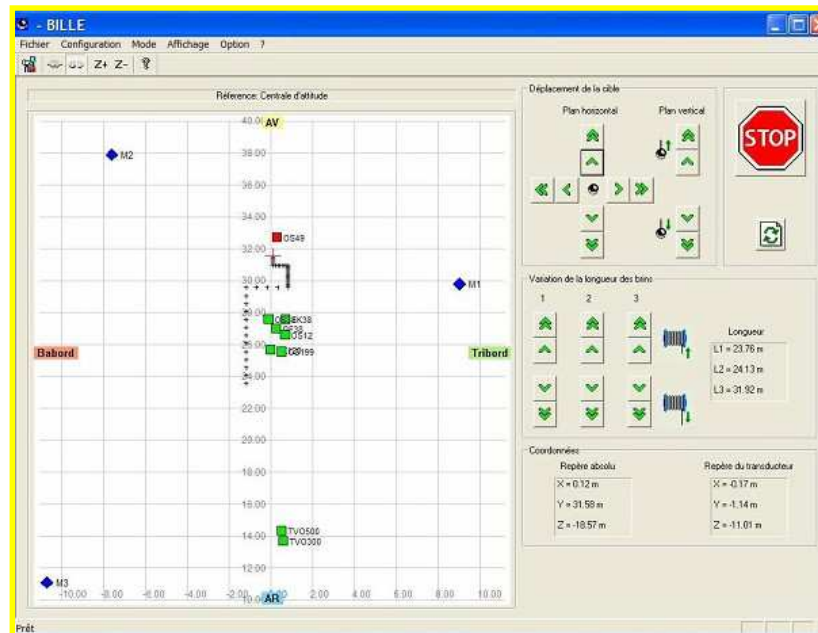


The software either in French or in English runs on any type of PC (windows 7).

The software requires to be given the position of each transducer and the three winches relative to the vessel, as well as initial cables length.

It then automatically controls the three winches simultaneously so as to propose the following main commands :

- sphere moving in cartesian coordinates (vertically and along two axes in horizontal plane),
- sphere automatic positioning under specified transducer
- automatic coverage of the transducer beam at fixed depth,
- direct control of each winch individually.

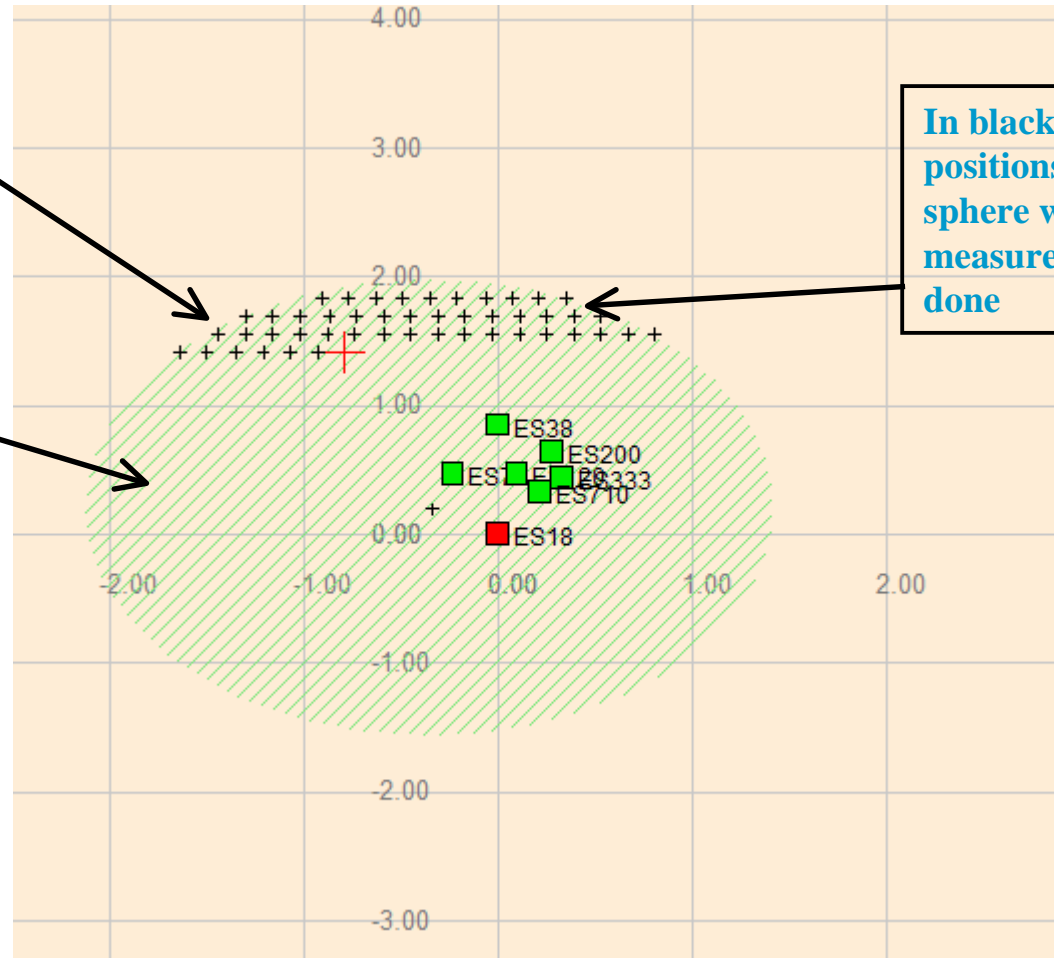


It provides at any time the visualization of the current sphere position relative to the vessel and the transducers.

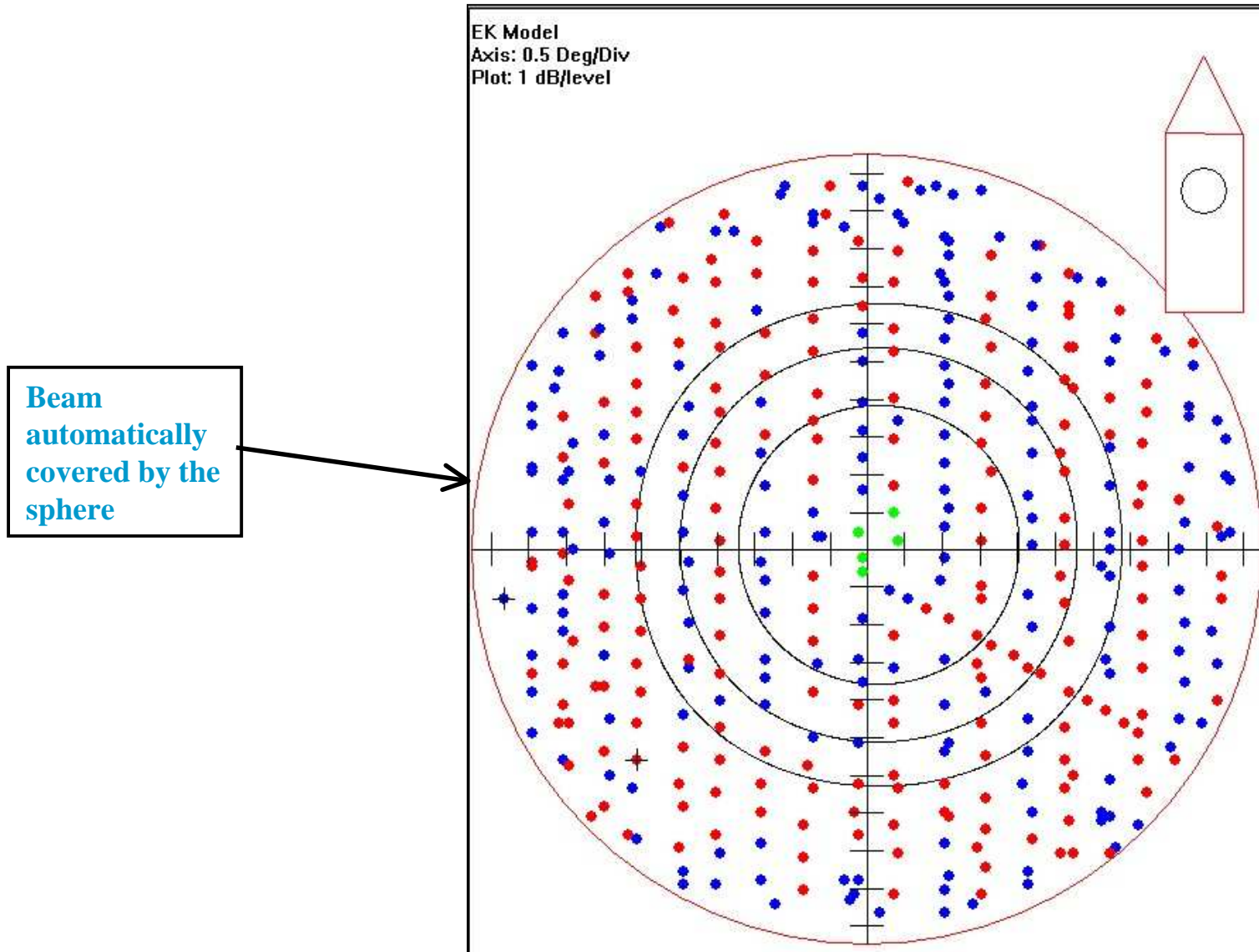
In red, the current position of the sphere

In black, past positions of the sphere where measures have been done

In green, the beam that the sphere should cover



Sphere detections and localisation by split-beam echosounder during calibration process



Shallow-water towed Sub-Bottom Profiler

A new Ifremer project in Marine Geosciences

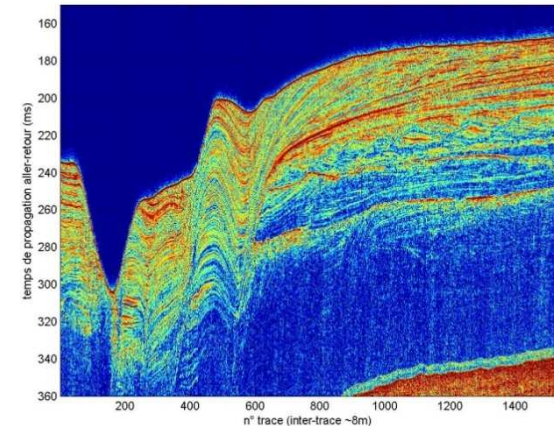


Sub-Bottom profilers in IFREMER fleet

- Low frequency arrays for deeper penetration
- Wide bandwidth transducers for better vertical resolution
- *SUBOP* : Ifremer's



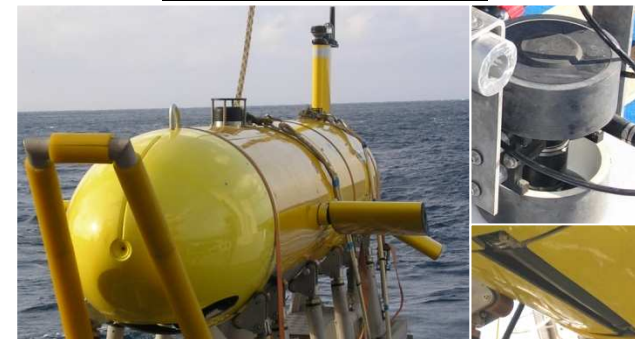
Oceangoing vessels



Coastal ship

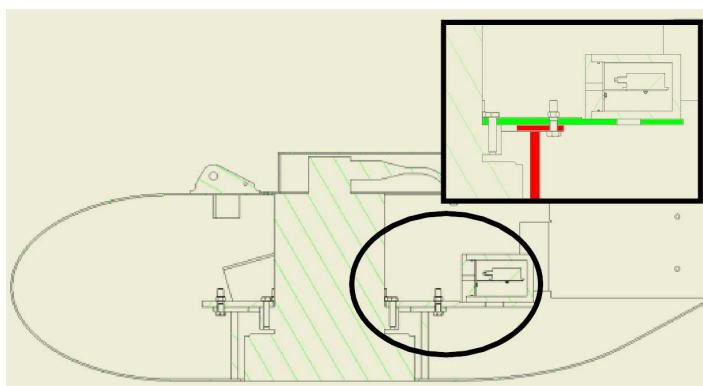


Deep sea AUV

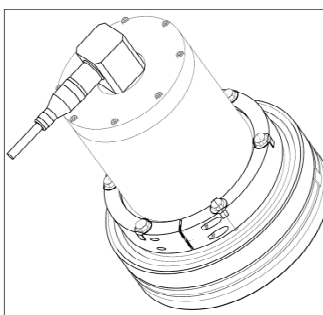


The shallow-water high-resolution SBP

Description	<ul style="list-style-type: none"> - Subsurface towed-fish (<1m). - Deployment from coastal vessel frame, at a speed of 6 knots. - 20 m < Water depth < 200 m
Towed-fish	<ul style="list-style-type: none"> - Single low-frequency transducer Tx / Rx (Tonpiliz technology). - <i>Additional sensors</i> : inertial measurement unit + pressure sensor.
Aboard	<ul style="list-style-type: none"> - Development of a new light electronic-unit (collaboration with IXBlue) : Power electronics (PWM / 2 kVA) + impedance matching unit + preamps - SUBOP data acquisition system, interfaced with GPS aboard.
Performances	<ul style="list-style-type: none"> - Chirp 1700-6000 Hz, 10 to 50 ms, SL ~ 193 dB ref. 1μPa @ 1m - Vertical resolution ~ 30 cm, Penetration ~ 50 m



Transducer Tx/Rx
(\varnothing 298mm, H 388mm)



2 kVA PWM
Power Amplifier



The Shallow-water towed SBP

Present status and future trends

Electronic part : qualified

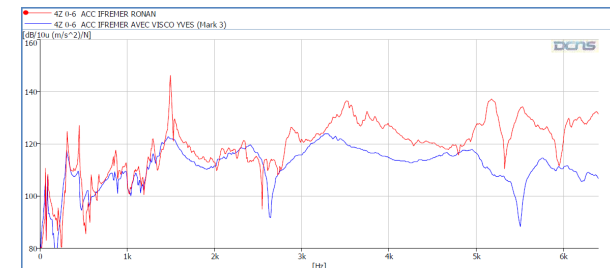
- Power electronics : meets requirements
- Receiving noise level : satisfactory
- Stability and repeatability of the output signal

Towed-fish : qualified at 6 knots

- Good hydrodynamic behaviour : low pitch, roll and heading changes
- The challenge of a navigation very close to the surface (0.5 m) is reached
- Acceptable distance from a noisy vessel to the towed-fish : 20 to 30 m
- Dedicated carrier cable : supplied and qualified
- Disturbing vibrations : solved thanks to the use of viscoelastic elements

Transfer to fleet operator : mid-2015

- Acquisition of a winch
- Operator-training
- Scientific cruise in Corsica (summer 2015)



Sea-trials in the Bay of Brest

LITTO0009_D20140606_T123634.SEG
transmitted signal : chirp 1700-6000Hz, 10ms, level 100%

