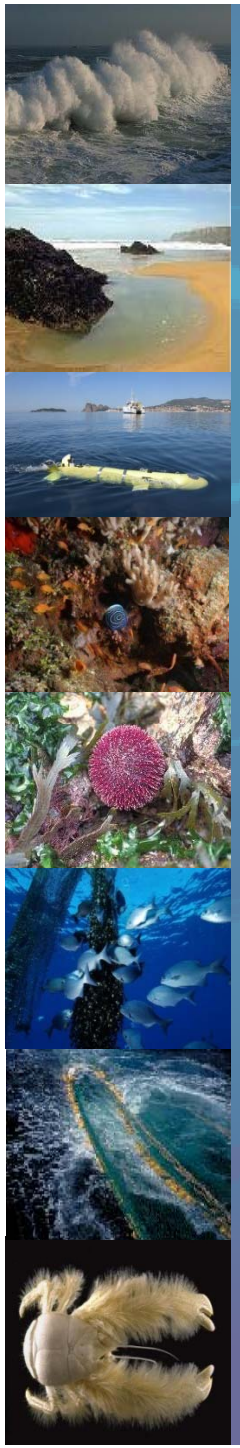
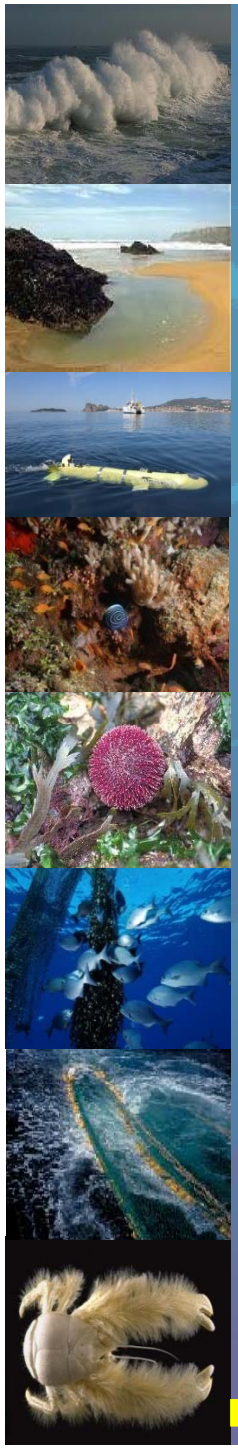


Ifremer

CTD rosette winch wave damping

Feasibility study &

first step for the concept definition



Scientific needs

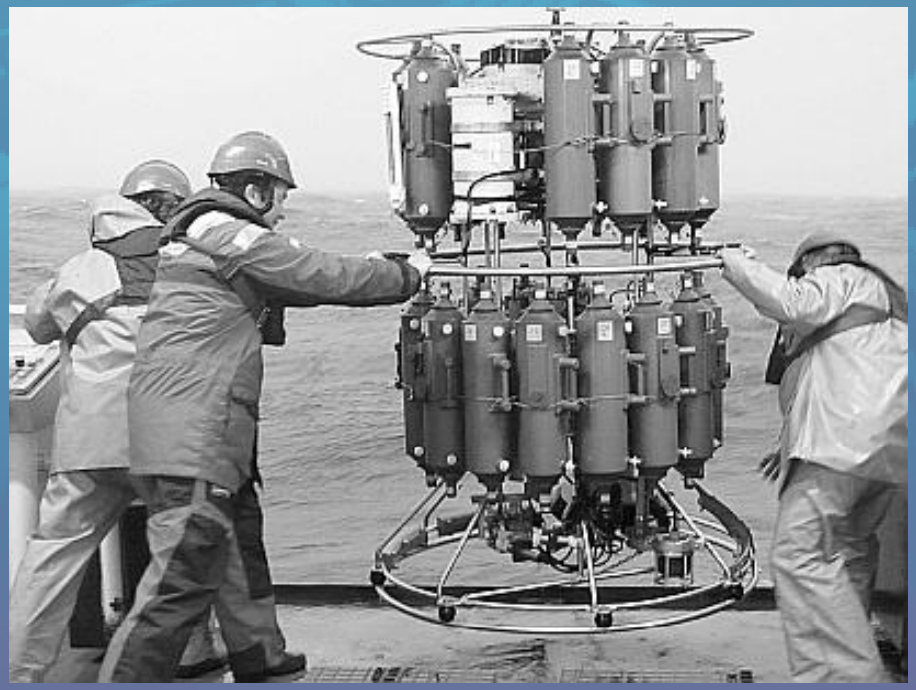
CTD rosette motion reduction for :

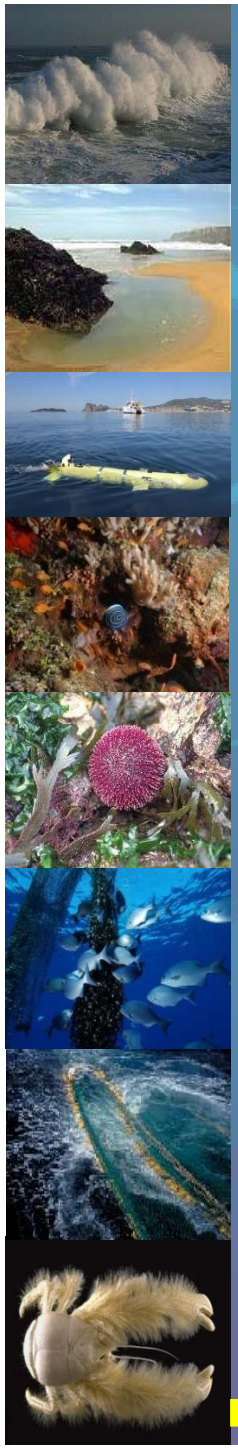
- water sampling

- ADCP measures

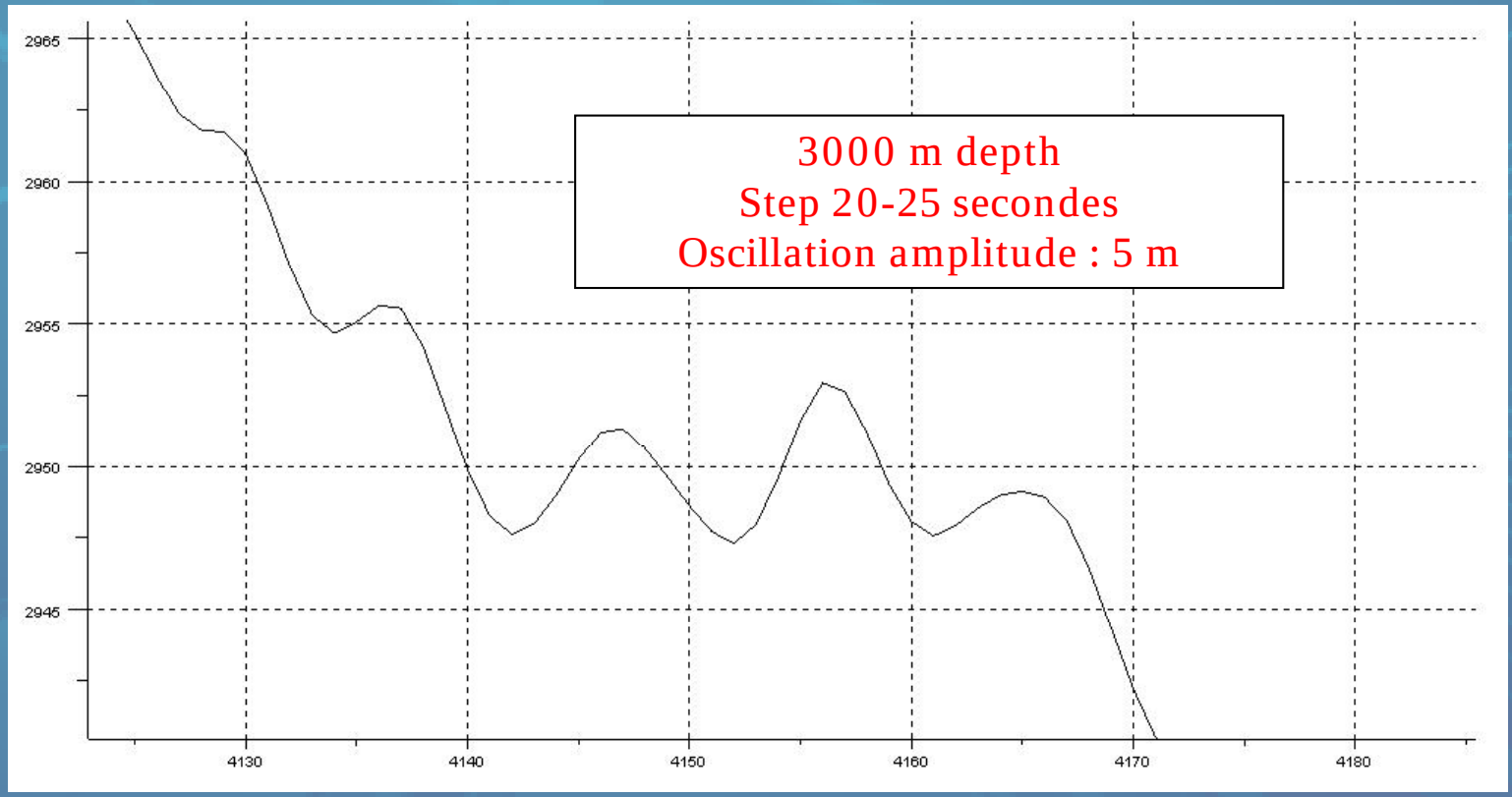
Other needs

Increasing cable life

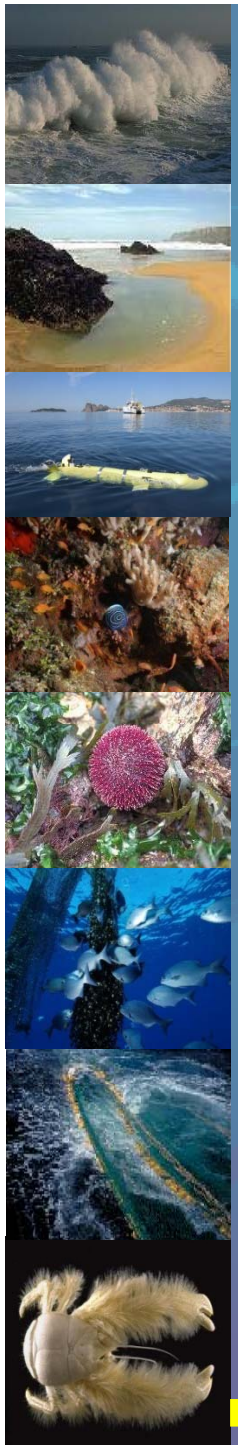




Current state

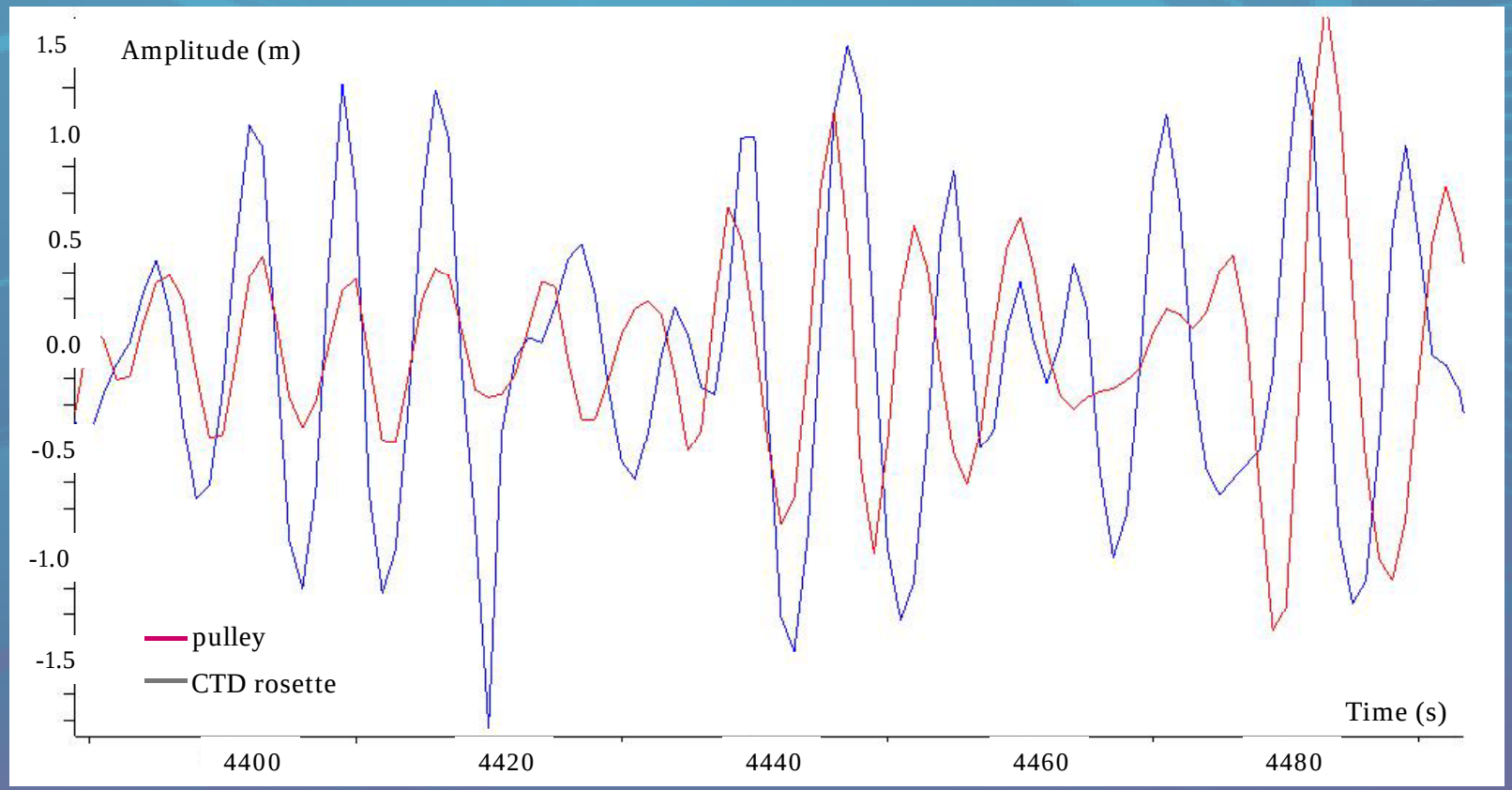


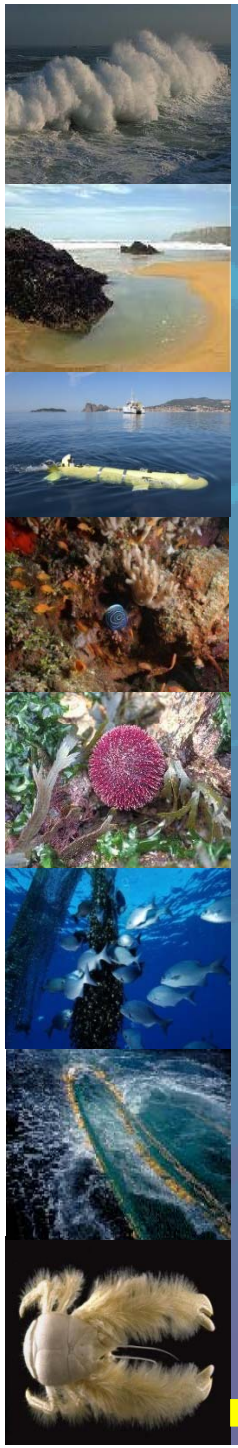
CTD rosette oscillation (measure with L-ADCP)



Relation between ship motion and CTD rosette motion

Pulley and CTD rosette oscillation





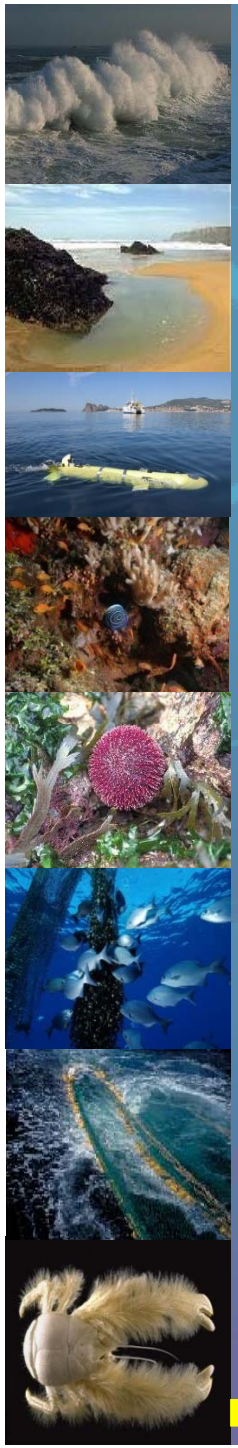
Data analysis

CTD rosette motion inferred by heave motion but :

CTD rosette motion is not a homothety pulley motion because of :

- cable elasticity
- cable and CTD rosette drag
- low weight of CTD rosette

Difficulties to evaluate mechanic response time

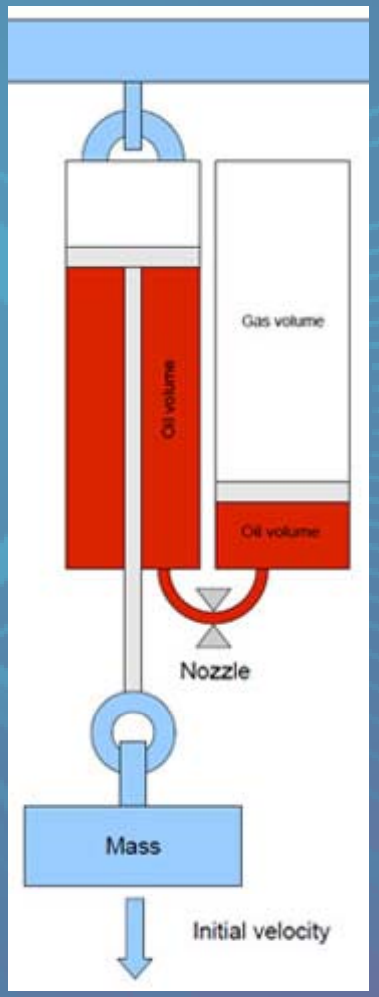


Possible solutions

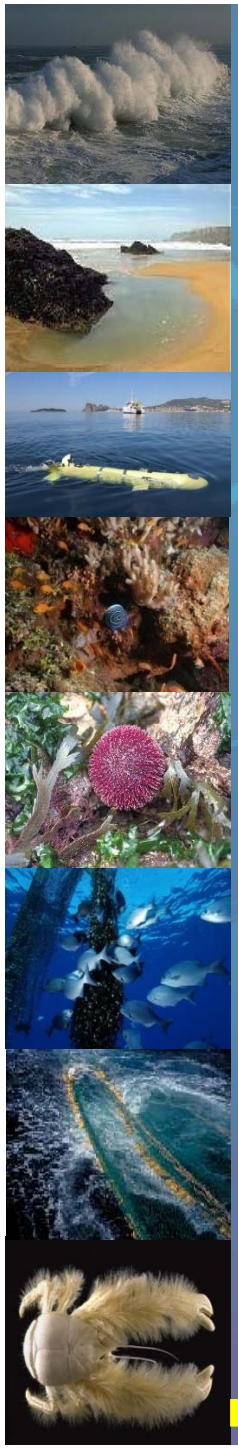
Passive system based on equable tension installed between CTD rosette and low part of cable

\+ **Very efficient : could absorbe 90% of motion**

\- **Difficulties to implement CTD rosette from ship to water, could hide beam of L-ADCP**

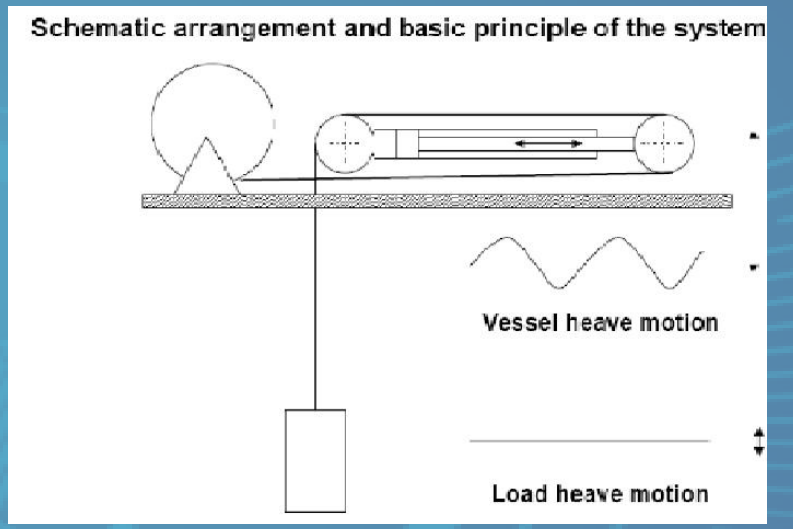


Crane master



Possible solutions

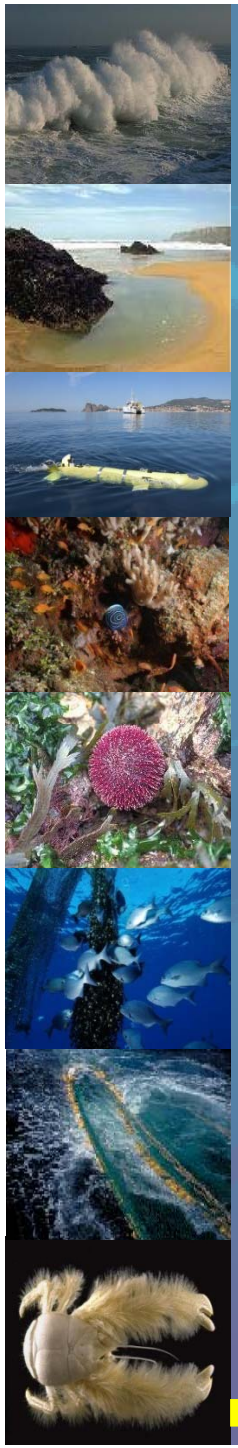
Passive system based on equable tension installed on board (installed on R/V L'Atalante)



\+ **No impact on CTD rosette**

\- **Efficient only for a pre-definied depth range (ex : 1000 m – 2000 m)**

Is really a shock absorber



Possible solutions

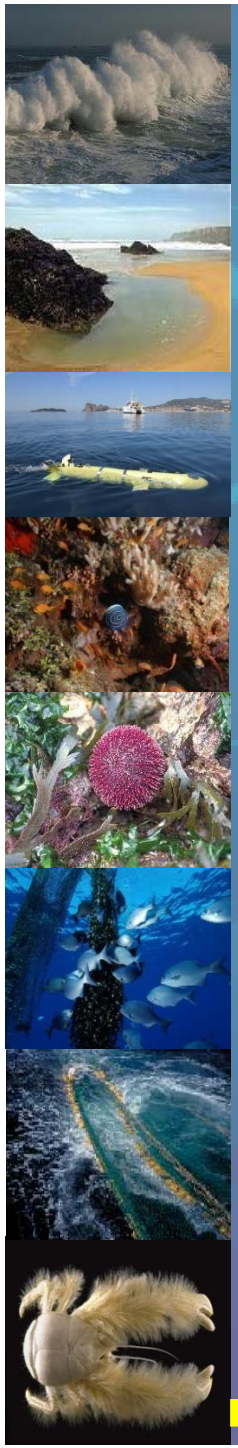
Active system driving the winch, with motion sensor unit on board

\+ **Absord ship motion so reduce motion inferred to CTD rosette**

\- **Efficient only for high load (> 20 tonnes)**

Could amplificate CTD rosette motion in case of dephasis

RAHCS



Possible solutions

Active system driving the winch, with motion sensor unit on board and on the CTD rosette

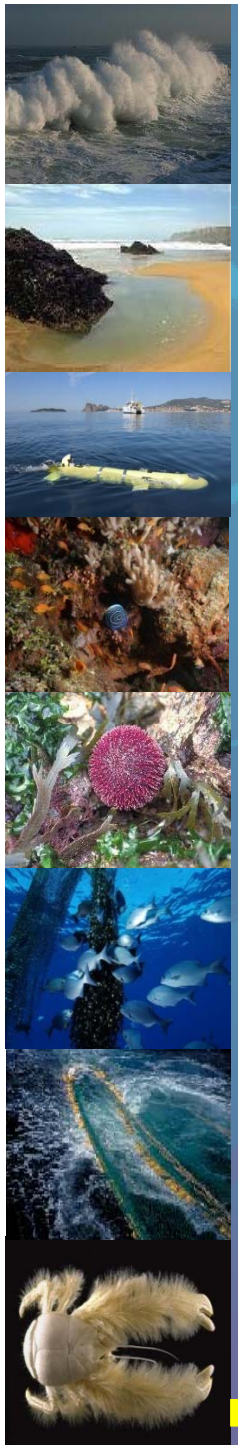
Efficient for low load

+

No CTD rosette motion amplification due to motion sensor on CTD rosette

-

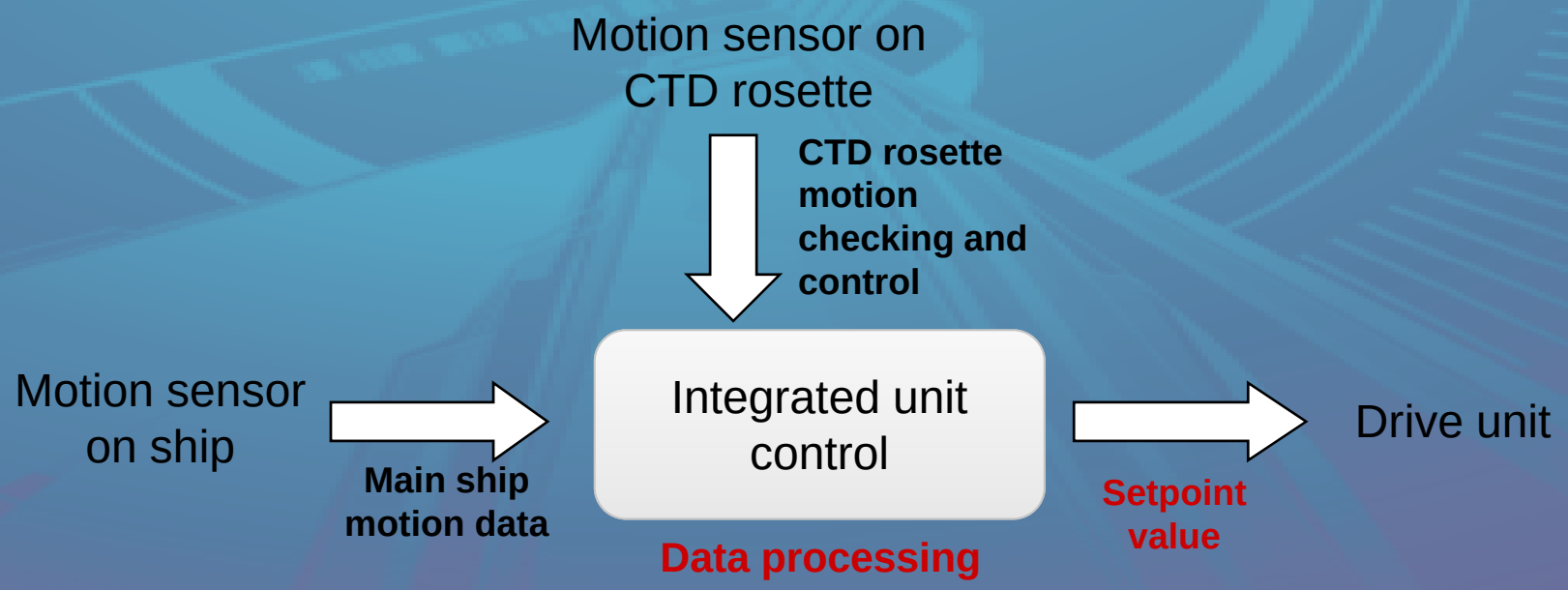
Needing to have electric wire in the cable able to support a high speed data transmission

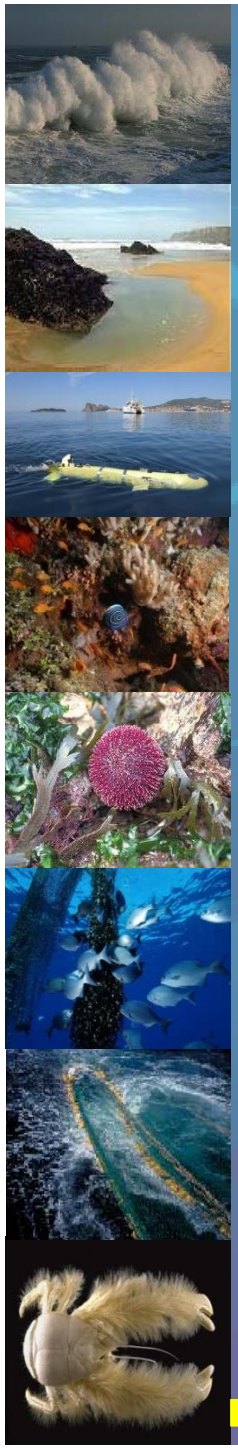


Active system with 2 motion sensor unit

Main motion sensor unit on board

Auxiliary motion sensor on the CTD rosette give real CTD rosette motion for motion checking and adjustment.





Wave damper concept

Caracterize more precisely the CTD rosette motion thanks to accelerometer sensor with several sea state

↓

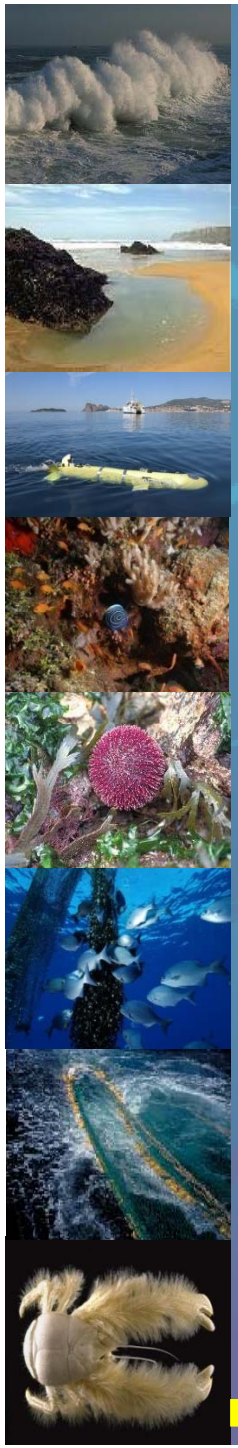
Define the shorter response time as a constraint design

↓

Design a wave damper

↙ ↘

Linear system **or** **Rotating system**



Other solution

Back forward to the scientific needs

ADCP measure

↘ **post processing**

Depth of water sampling bottle closing

↘ **installed a precise pressure sensor on CTD rosette**