



Institut
Mines-Télécom



AVEROES

A ROV for automatic survey of an underwater environment



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AVEROES: Automated VEHICLE for Remote OperatEd Sentinel

A ROV at Telecom Bretagne

AVEROES: scientific perspectives

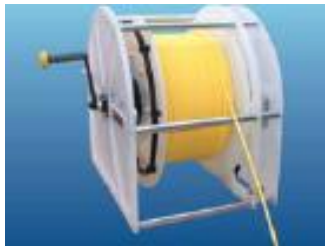
A convention with CELADON

Partnership and future investment

ROV : *Remotely Operated Vehicle*

Saab Seaeye Falcon

Speed limit: 20km/h
Depth limit: 300 m



Optical fiber tether: control, video, data
Copper: energy length = 450 m

Central unit:
control, video, navigation, interface



ROV : *Remotely Operated Vehicle*

■ Financial partners

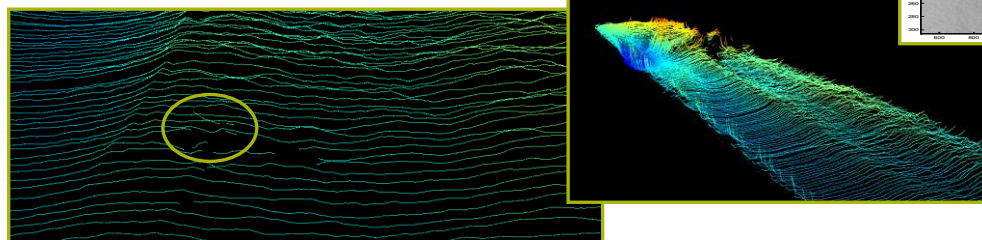
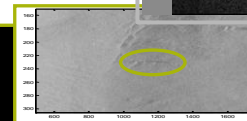
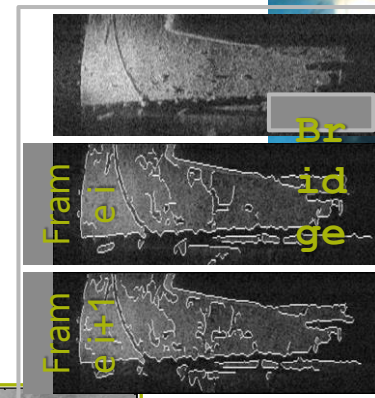
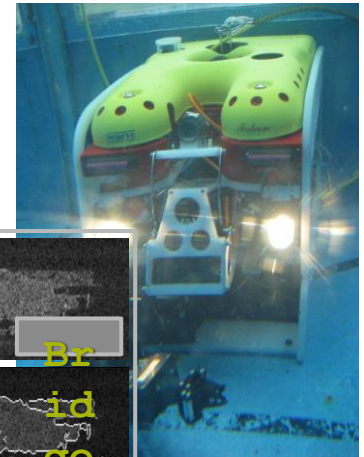


AVEROES: scientific perspectives

- ROV = scientific platform to develop and validate technical process in underwater acoustics

Domains

- Contactless data exchange: EM and optical underwater transmission
- Array processing (T. Chonavel, J.M. Le Cailllec)
- Mission control and decision (D. Pastor)
- Registration (D. Gueriot, F. Maussang)
- Beacon & localization (Canopus) (C. Fontaine, Ch. Laot)
- Scene analysis (C. Delacourt, G. Mercier)
- Underwater communications (J. Trubuil, C. Laot)
- Operational Trial and data analysis (R. Cancouet)



AVEROES: scientific perspectives

- ROV = scientific platform to develop and validate technical process in underwater acoustics

Applications:

- Harbor (civilian and military) surveillance
- Battle prep et rapid assessment
- Open fields of windmills
- Sea state parks



© Mer et Marine



© Le Télégramme



© Wikipedia



© Yann Arthus-Bertrand

Projects:

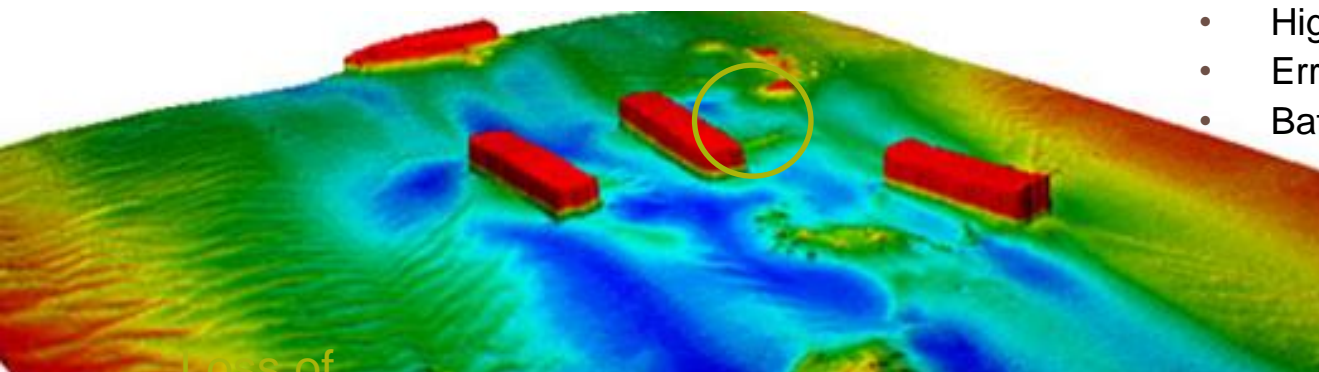
- Canopus FUI label PMBA
- Ipsus: Ph.D. thesis A. Saucan
- detection and localization capabilities for harbor surveillance and MIW (TB, WHOI Edgetech Ltd)



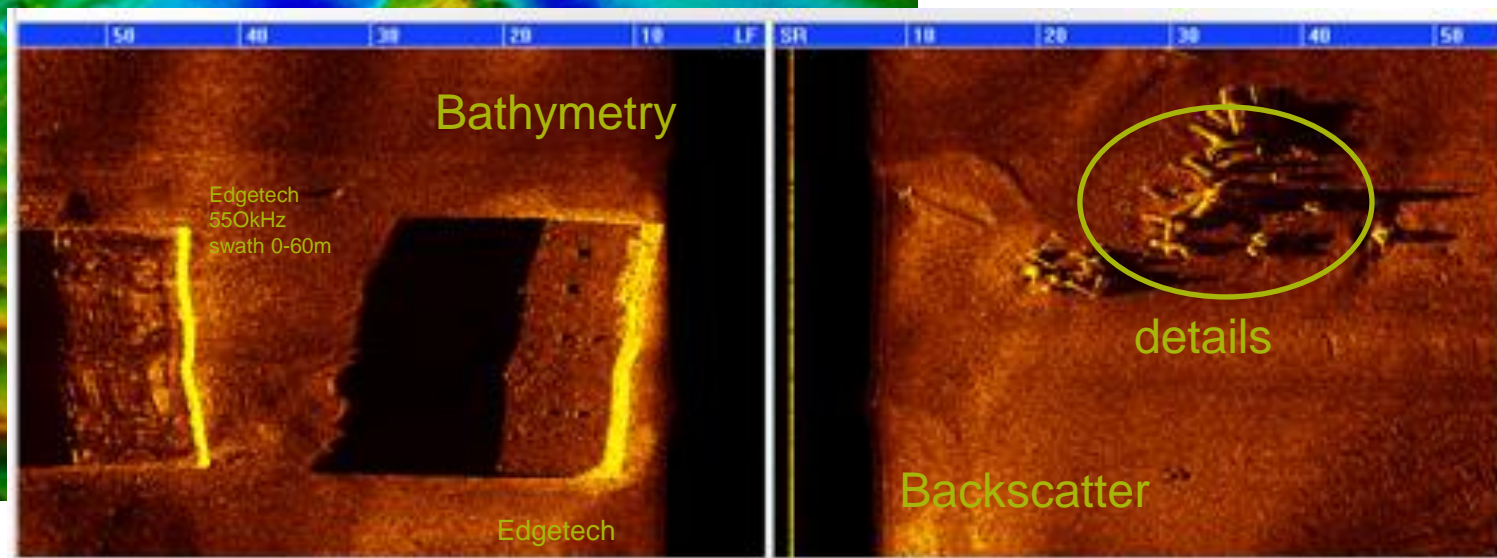
AVEROES: scientific perspectives

■ Calibration and large interferometry

- High resolution bathymetric images
- Error and artifacts reduction
- Bathy associated to the image

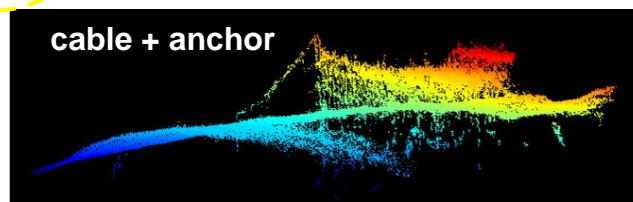
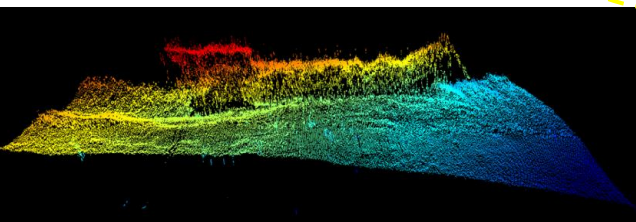
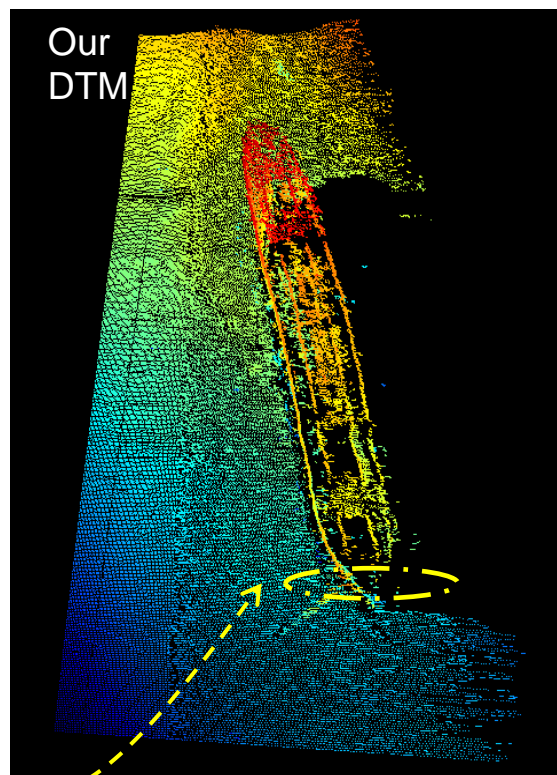
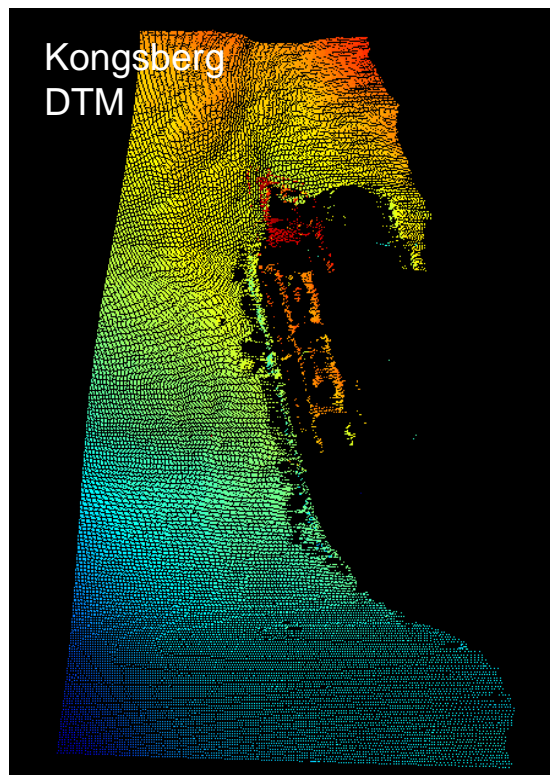


Loss of details

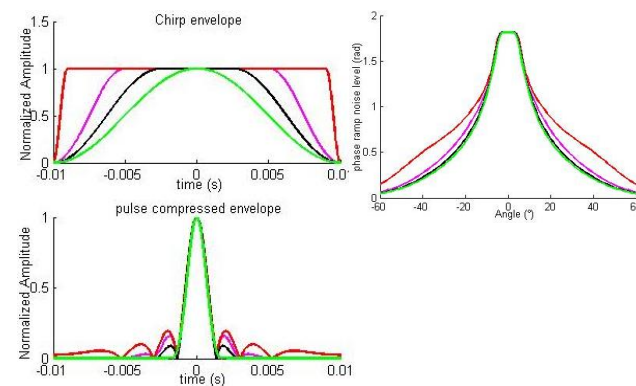


Traitement du signal et des images

High resolution bathymetry



Signal optimisation



Partners:
Ifremer
Shom
Kongsberg Maritime

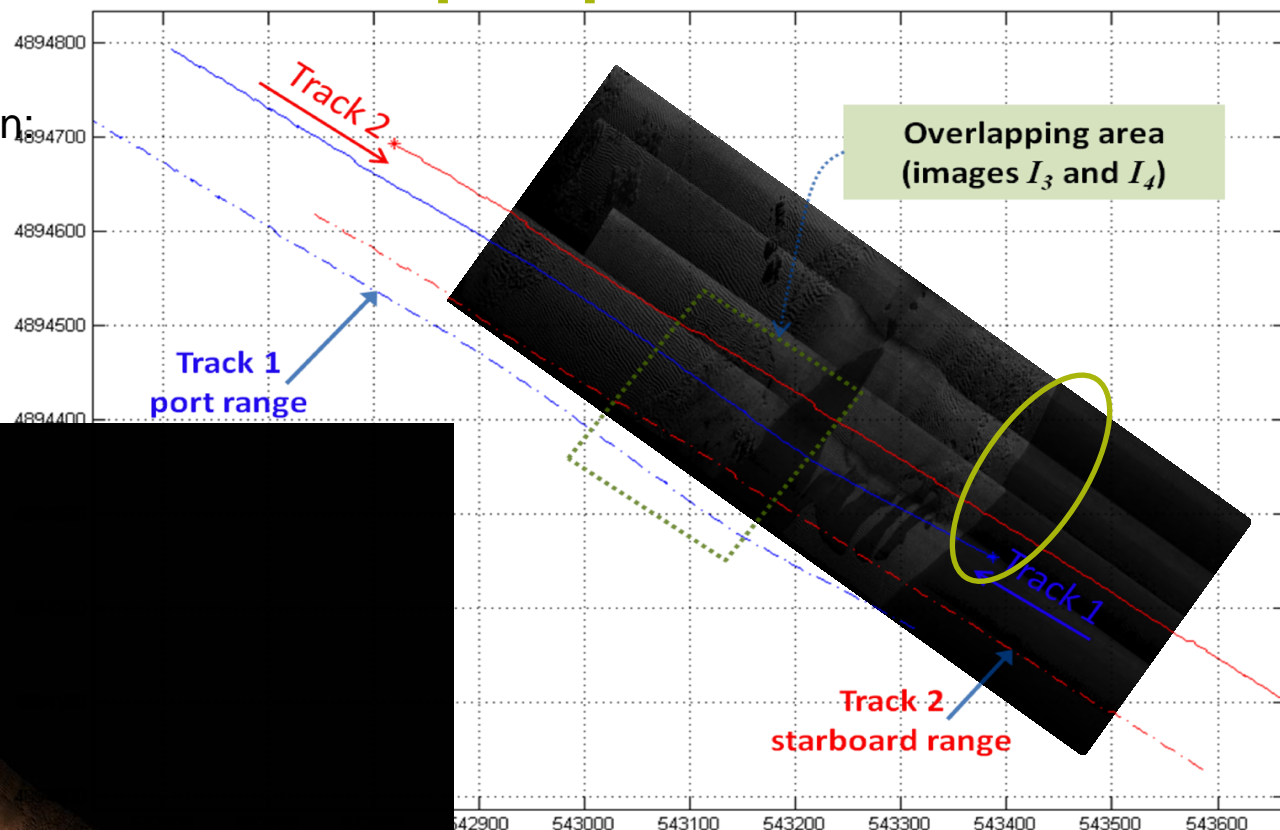


AVEROES: scientific perspectives

Mosaicking

Controlled data integration:

- Navigation
- Image
- Bathymetry



Physical parameters of navigation improve 2D mosaicking



AVEROES: scientific perspectives

■ Learning machine (threshold) and autonomous navigation:

- Different sensors
- Different sonar tracks
 - RDT Sonar adaptation
 - Robust input data

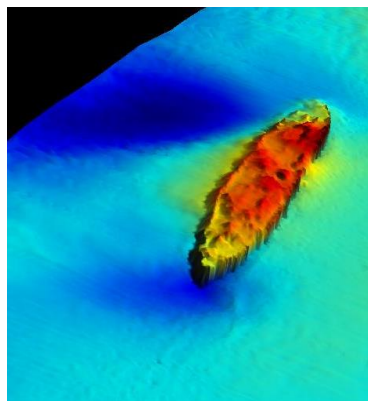


Taking the optimal decision thanks to precise data

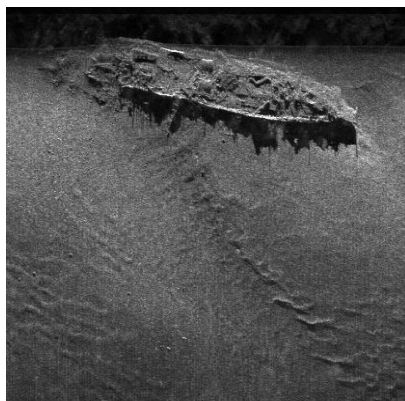
3D_{HQ}

«Absolute levels»

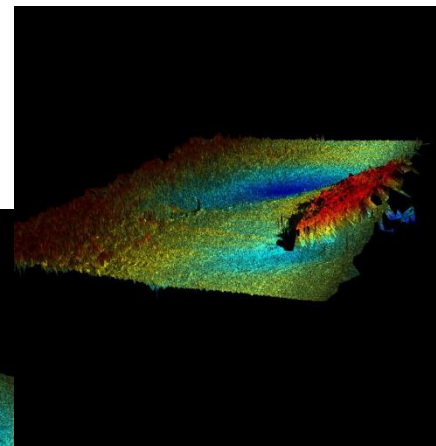
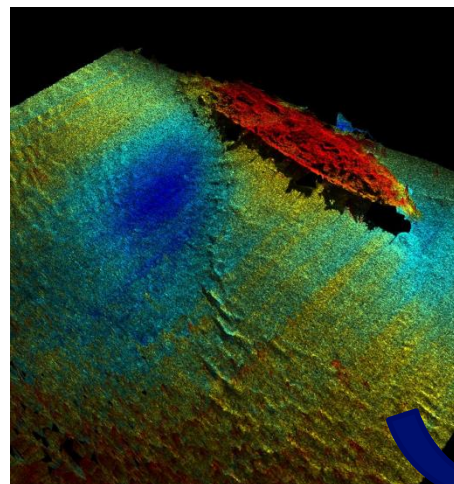
Pseudo-invariant data



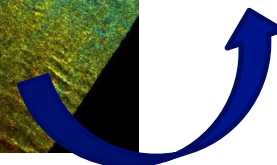
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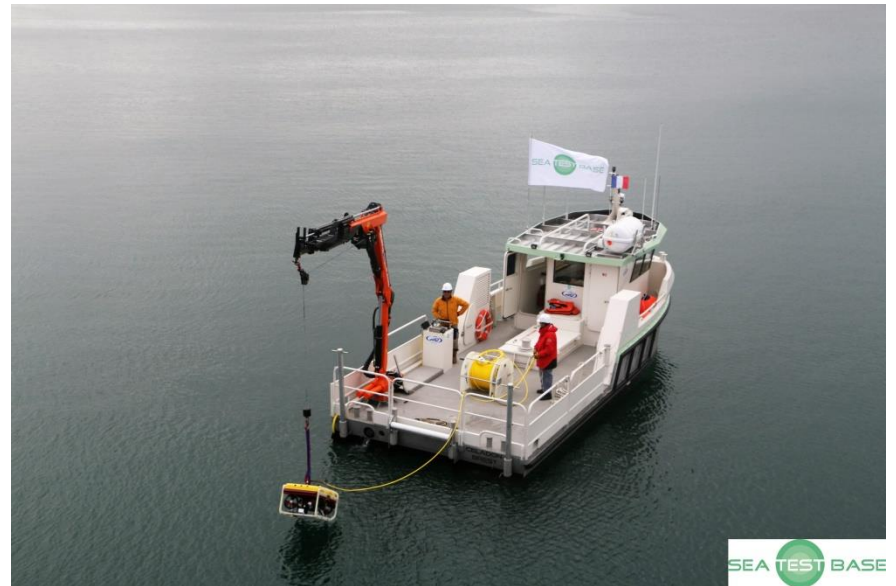


same?



A convention with Celadon

- **Convention signed between Telecom Bretagne and Celadon:**
 - Offers a platform and open perspectives to investigate new strategic domains



Partnership and future investment



Canopus project, positioning system

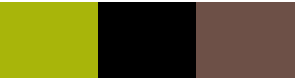


Registration and navigation equipment

Future equipment:

- Manipulator arm
- Electrical crane and rigging
- Electronics
- Targets





Quai des Sciences, Brest 2016

Our team: D. Guériot, J.M. Le Caillec,
F. Maussang, C. Sintès, B. Solaiman



Celadon, our partner:
C. Aubry, Y. Auffret, J.Y. Mulot



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YouTube Telecom Bretagne channel:
"Minute du Chercheur"

...and now, a short video...

