

# Optical fibre sensing for energy assets monitoring

Alexandre Goy



360 CARLA Career Symposium

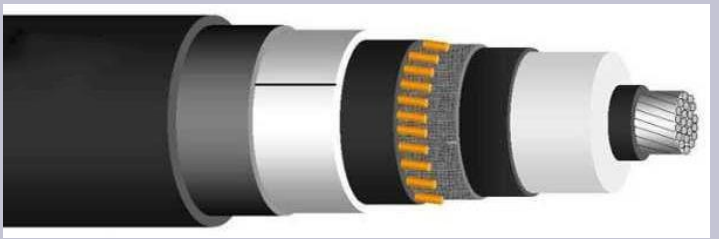
May 7, 2026, Burgdorf

# EOSS part of Prysmian



## Prysmian, world leader in power cables

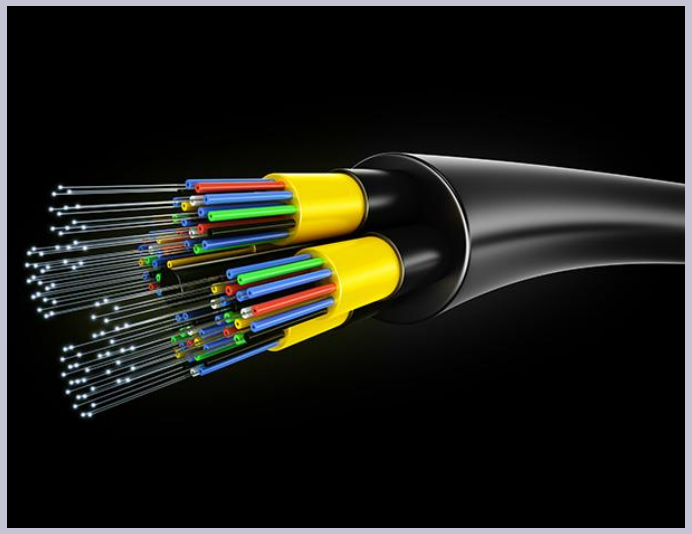
 <b>+150</b> Years of experience	 <b>+50</b> Countries	 <b>33 k</b> Our employees	 <b>+17</b> Billion Sales in euros
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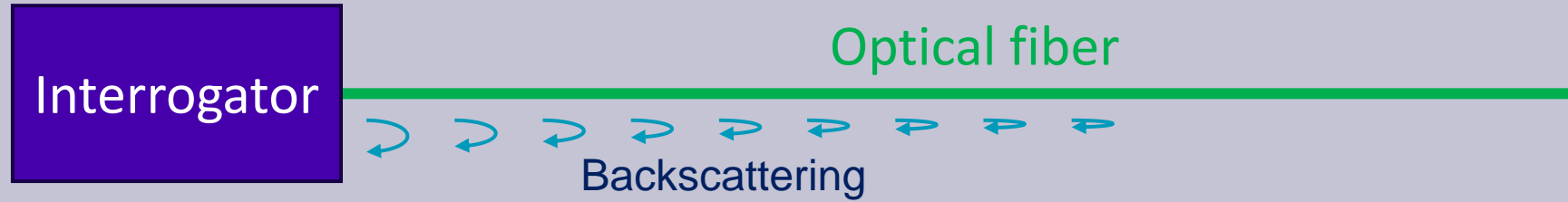
**EOSS**  
Electrical and Optical Sensing Solutions

The merge of

- **Omnisens**, Optical fiber sensing
- **Prysmian Electronic**, Partial discharge detection



# Optical Sensing Interrogators



## Temperature Sensing

### Raman DTS



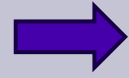
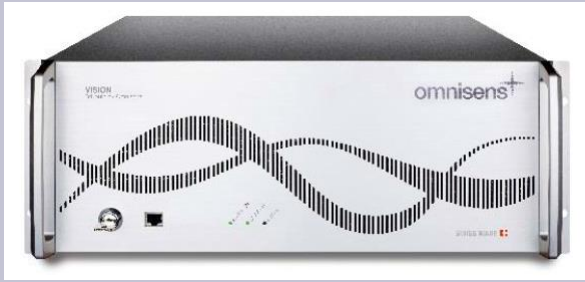
### Brillouin DTS



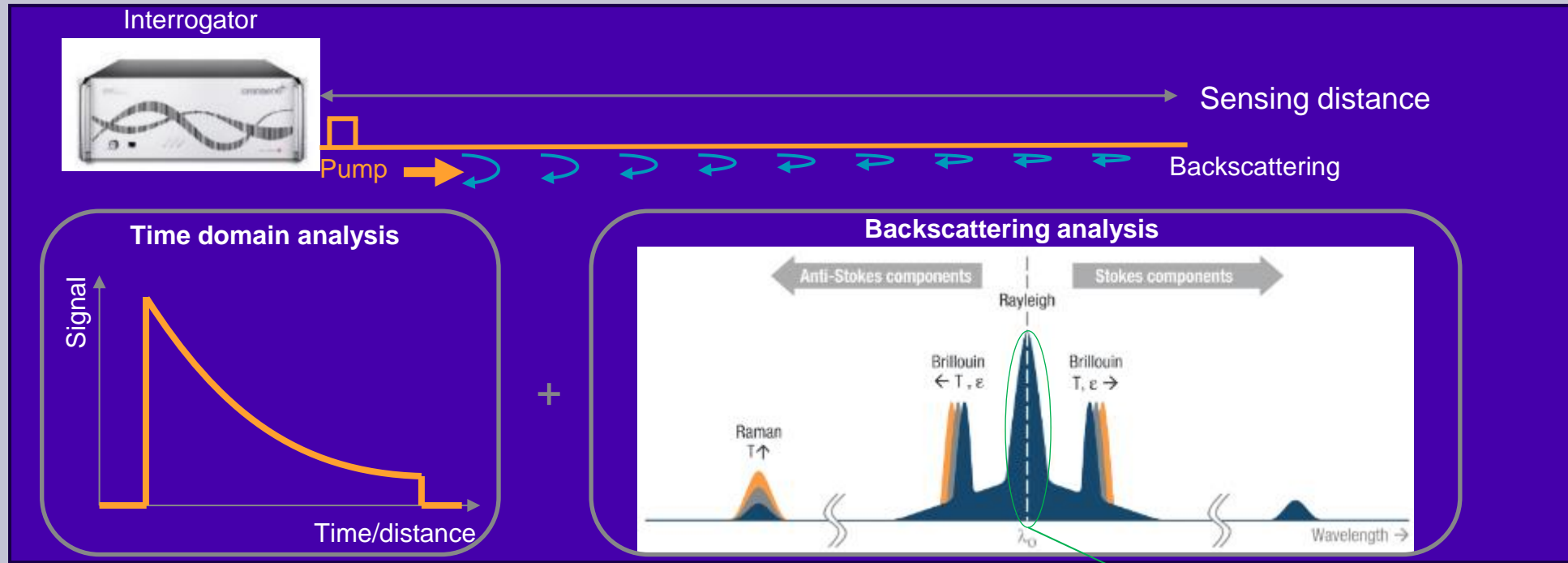
## Acoustic Sensing

### Rayleigh $\phi$ -OTDR



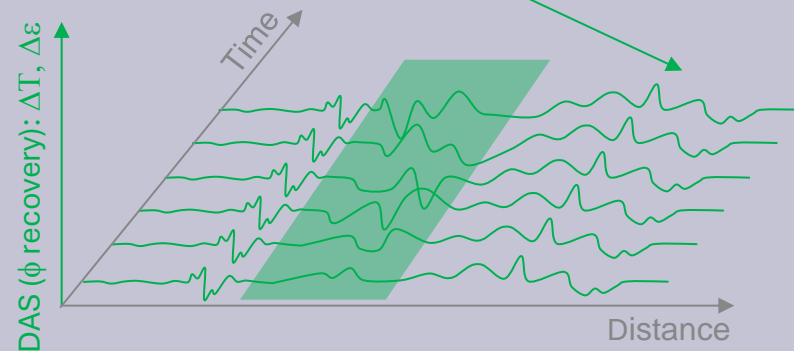


# Distributed Fibre Sensing Principle



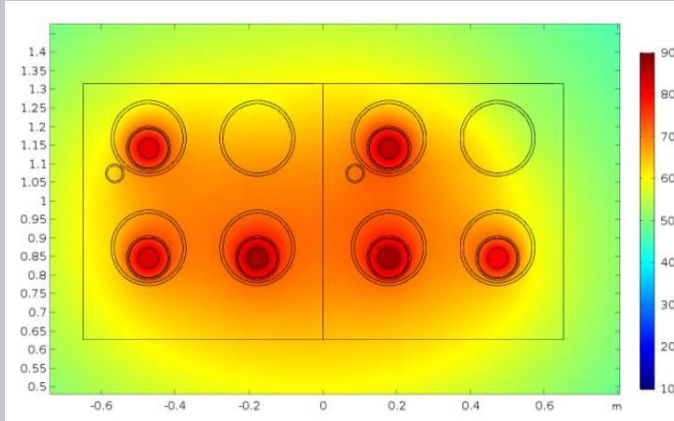
Measurement of intensity and phase of Rayleigh backscattered light

- Over distance: localization
- Over time: vibration

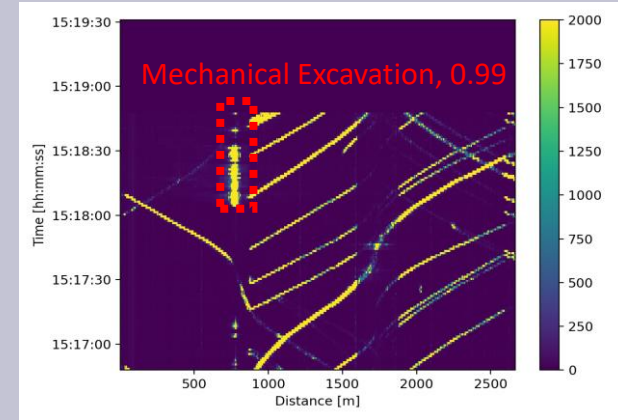


# Optical Sensing Algorithms

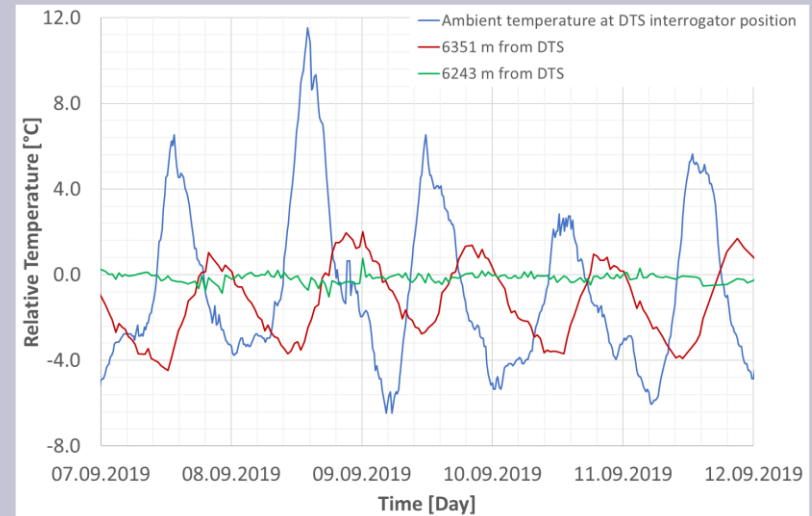
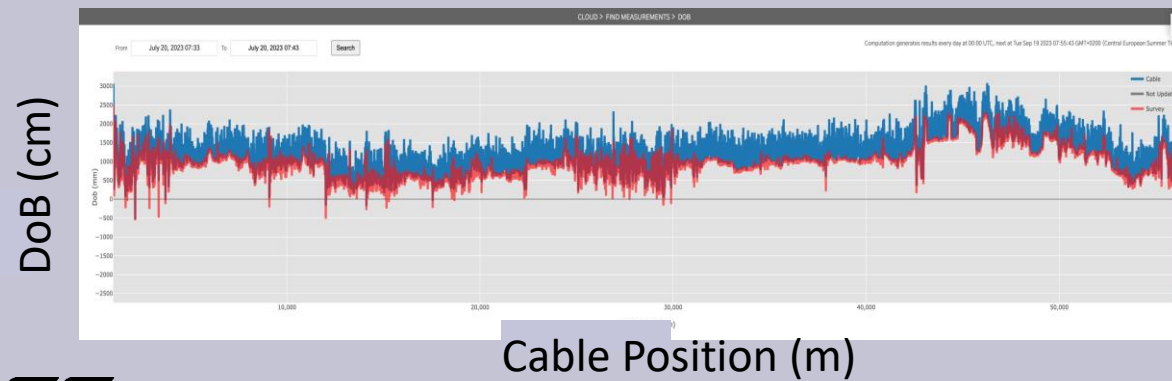
## Real time thermal rating



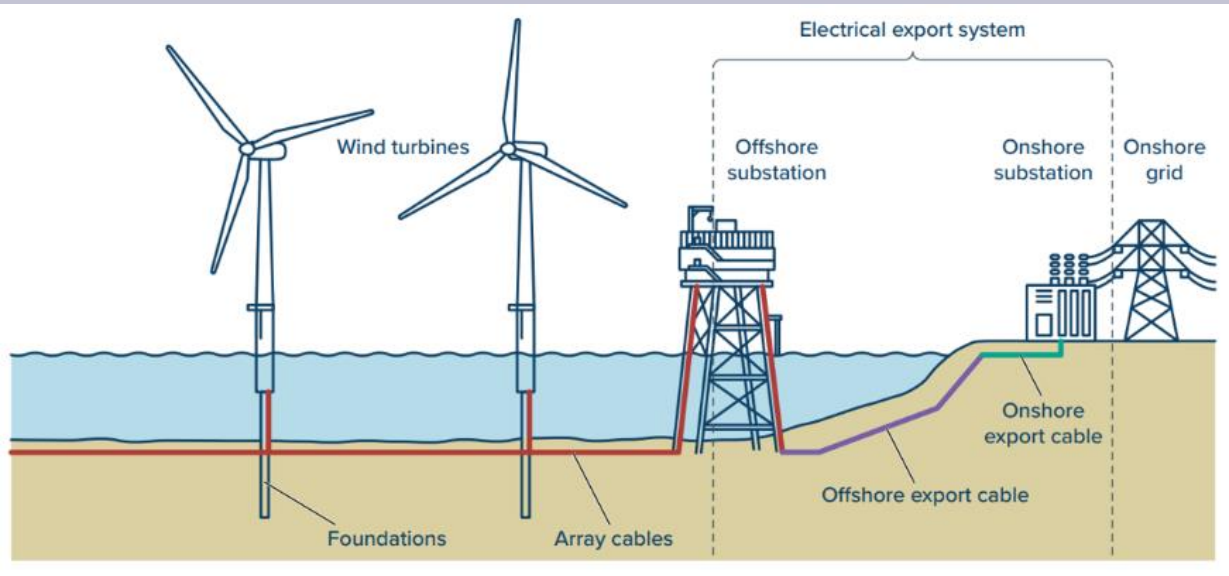
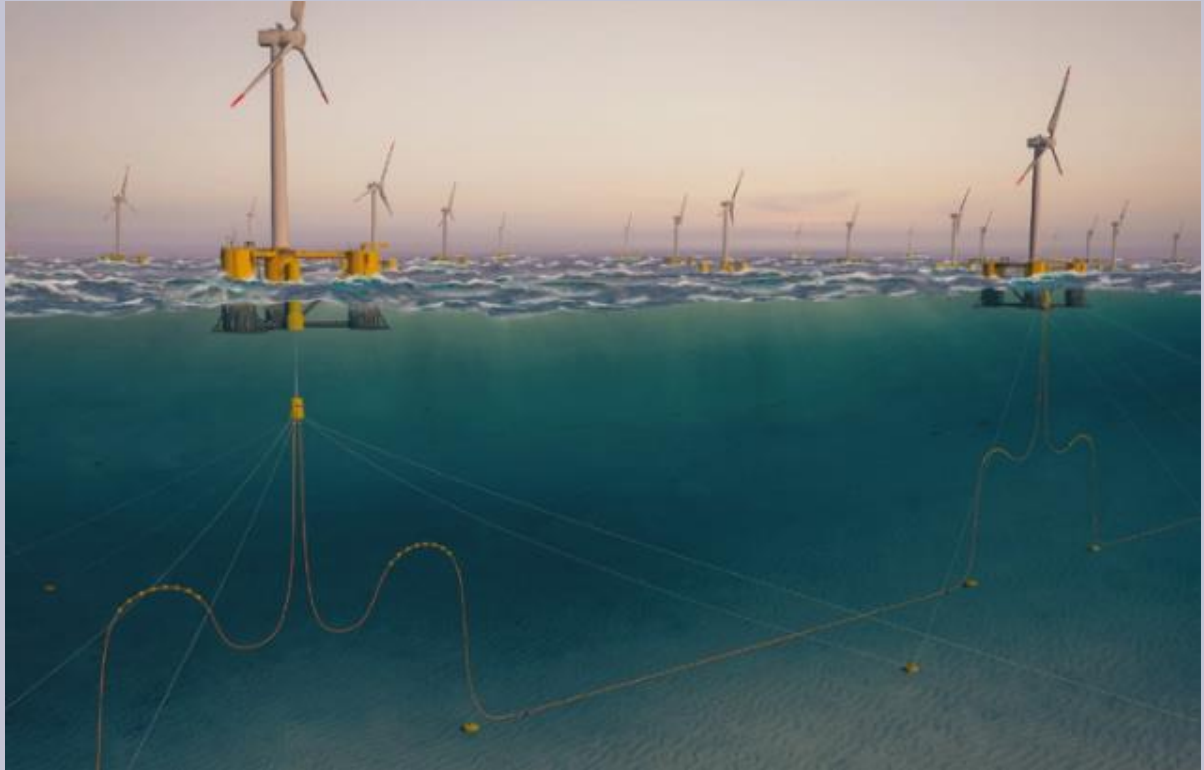
## DAS data analysis



## Cable Depth of burial

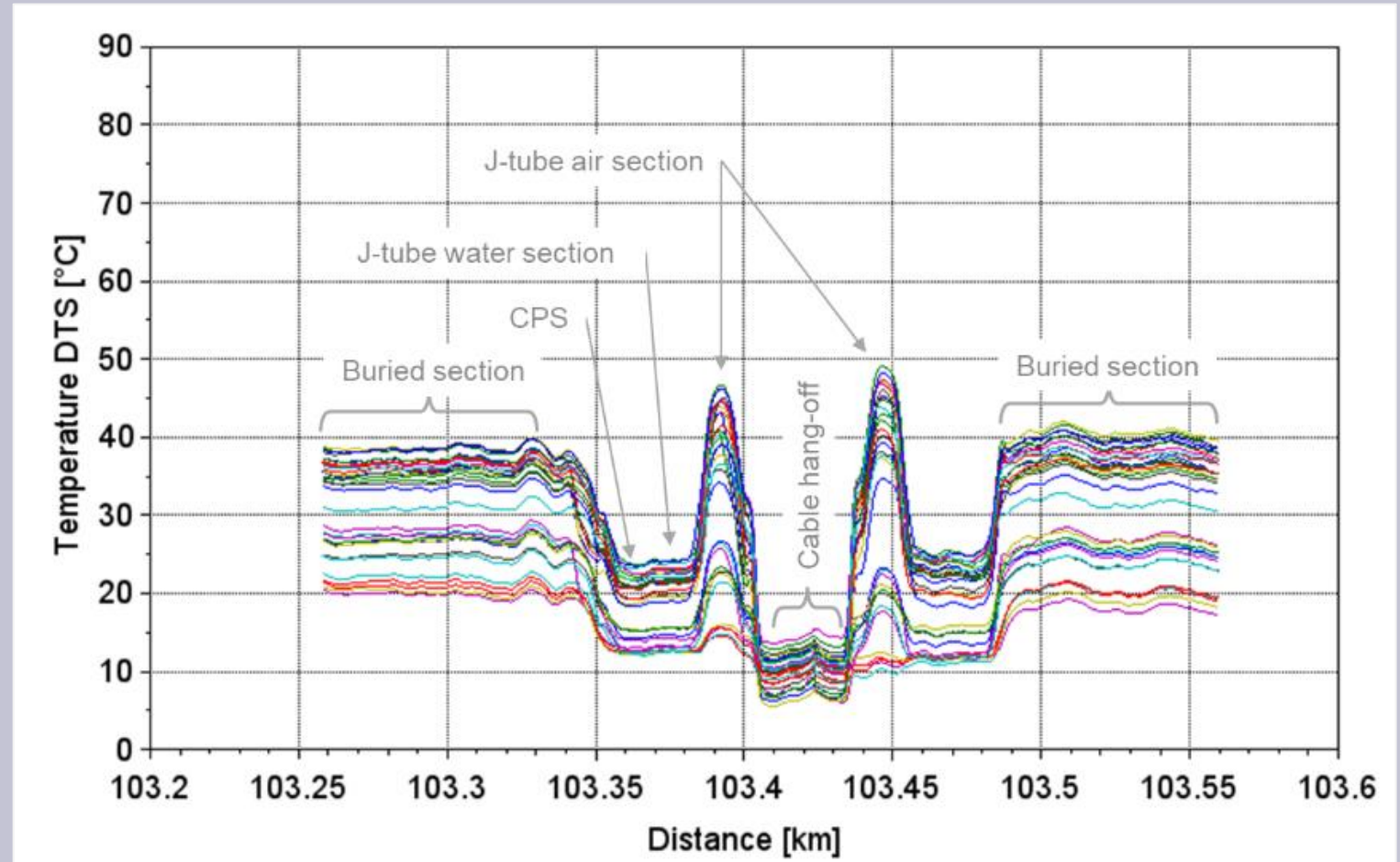


# Typical offshore windfarm



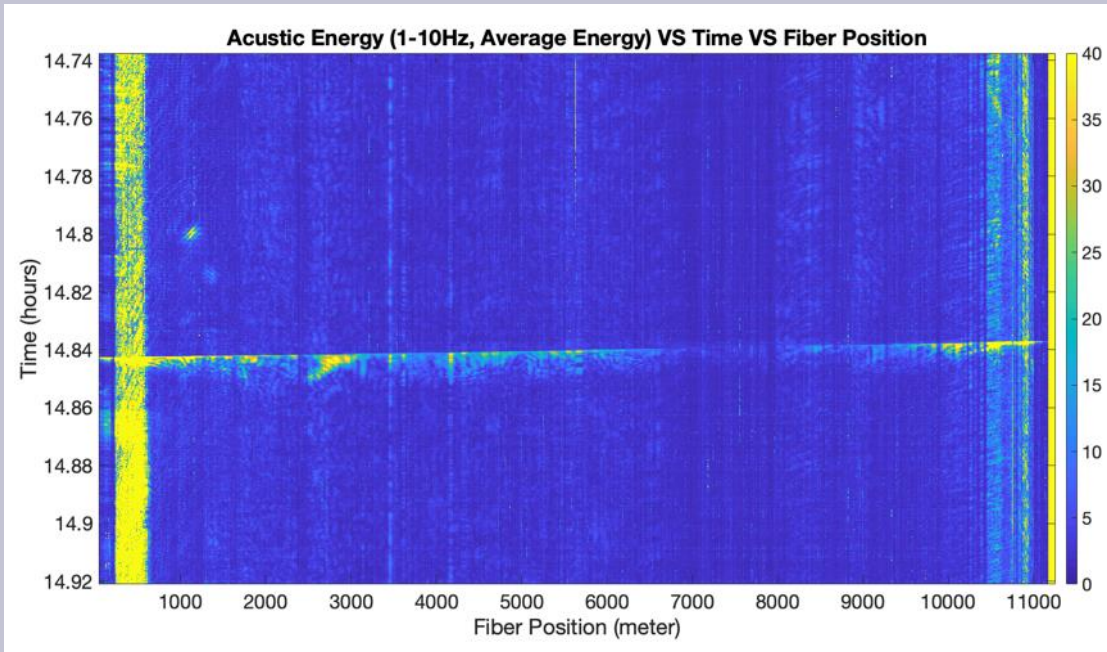
# Complex export cable route

- DTS
  - Temperature profiles shows
    - Load variations
    - Cross-section changes
    - HDD and road crossing
    - etc
- J-tube
  - Large Temperature variations between
    - Buried section
    - In water/CPS section
    - In air (upper J-tube section)



# DAS sensitivity

- Fibre in Lemman lake



29.07.2019, 15:54 Actualisé il y a 18 heures

## Déflagration en Suisse romande: un jet militaire passe le mur du son



PAR PAULINE BURNIER

Réagir à cet article

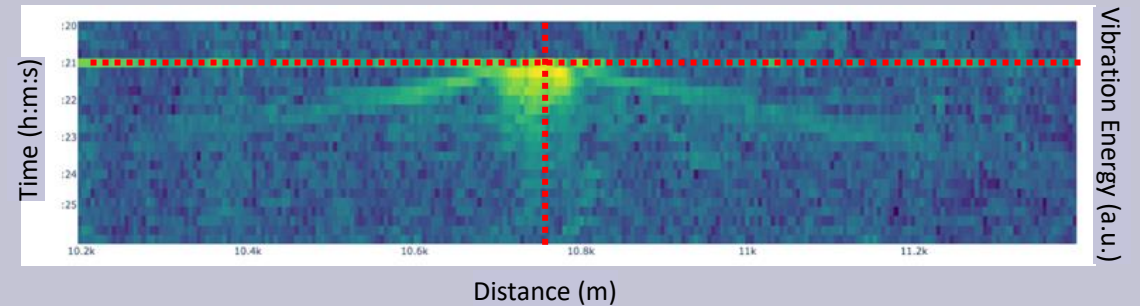
**EXPLOSION** Une forte «déflagration» a été entendue vers 14h50 notamment vers Lausanne. Il s'agissait du franchissement du mur du son par un F/A-18 engagé dans une opération de police aérienne, indique lundi l'armée suisse.

Lundi, vers 14h50, un bruit d'explosion a retenti en Suisse romande. Très vite, les gens se sont questionnés sur les réseaux sociaux. Le bruit d'«explosion» a été ressenti de manière particulièrement forte dans la région de La Côte et jusqu'à Lausanne.

Le gros «boum» a entraîné de nombreux coups de téléphone à la police lausannoise, a précisé Jean-Philippe Pittet, porte-parole de la police, interrogé par Keystone-ATS. La plupart des gens étaient inquiets, a-t-il ajouté en renvoyant à l'armée pour les explications.

# Fault localization

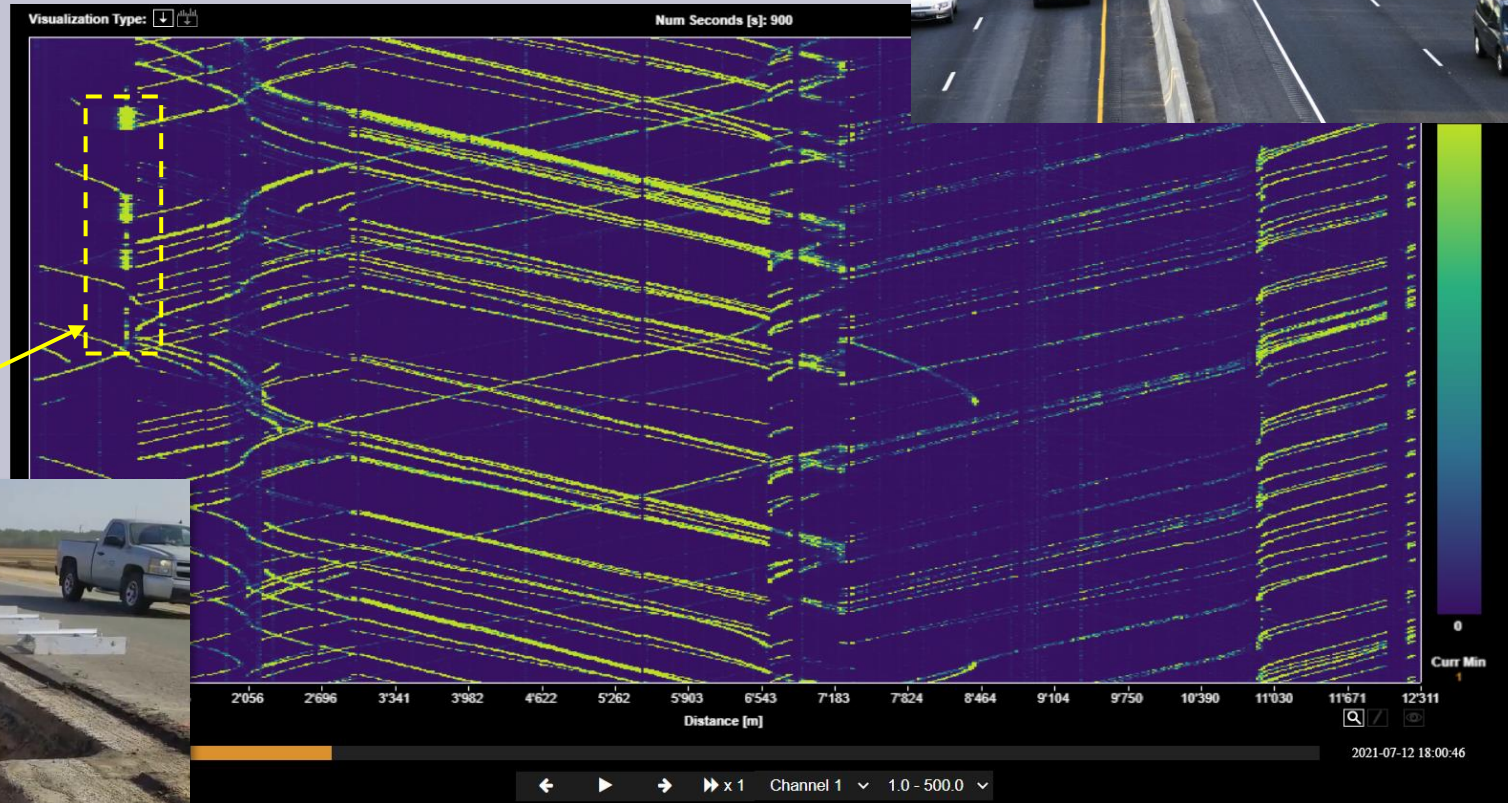
- High energy fault
  - Localization using acoustic signature from distance calibrated DAS
  - Comparison with cable postmortem analysis



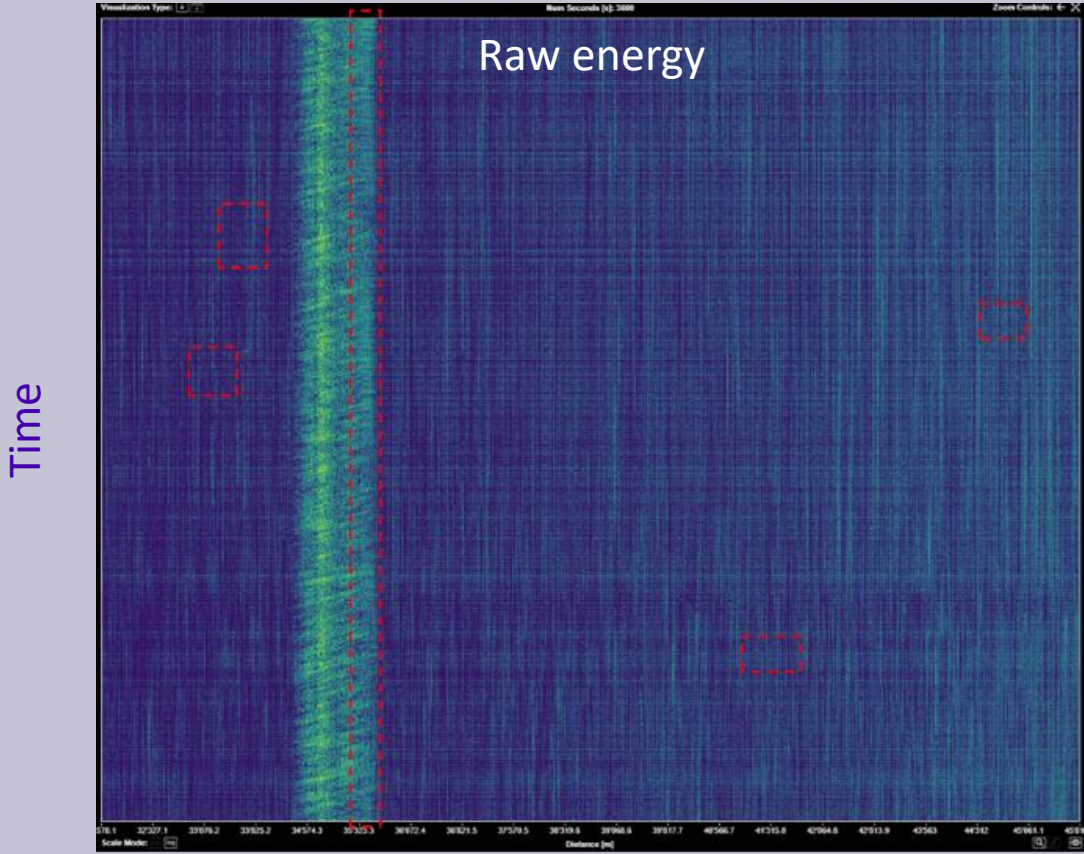
10mnr

- DAS location was within 10m of fault true position as per cable KP

# Intrusion Identification



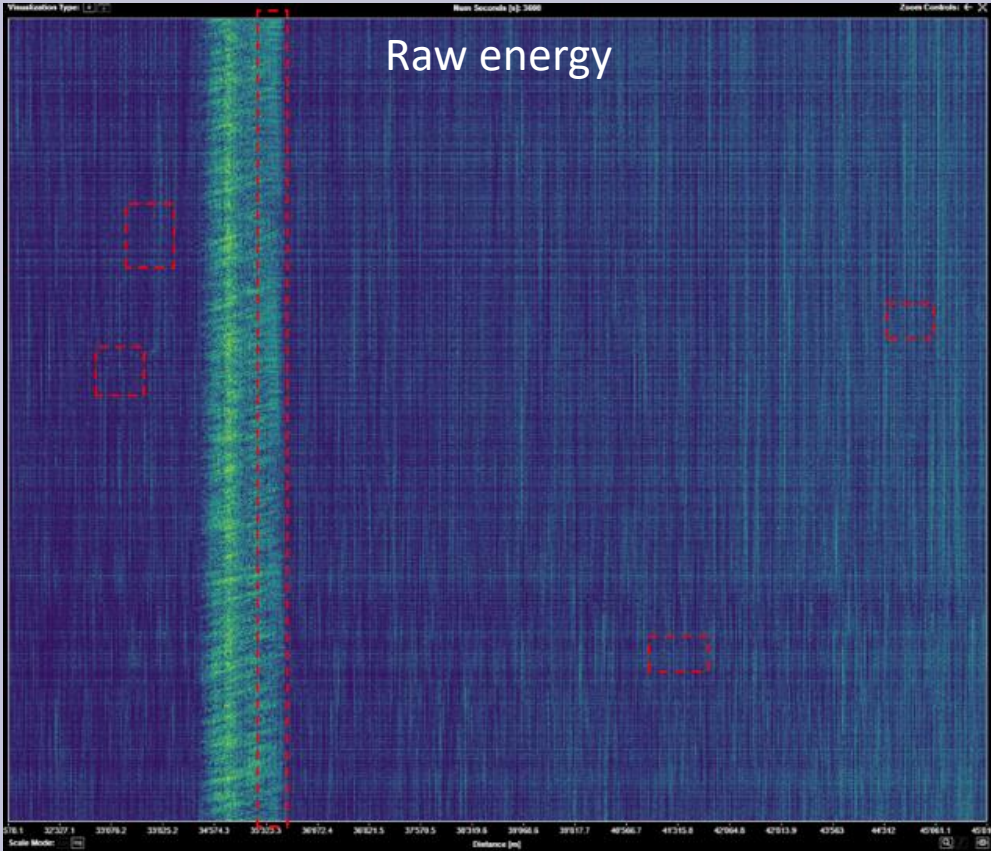
# Offshore anomaly detection



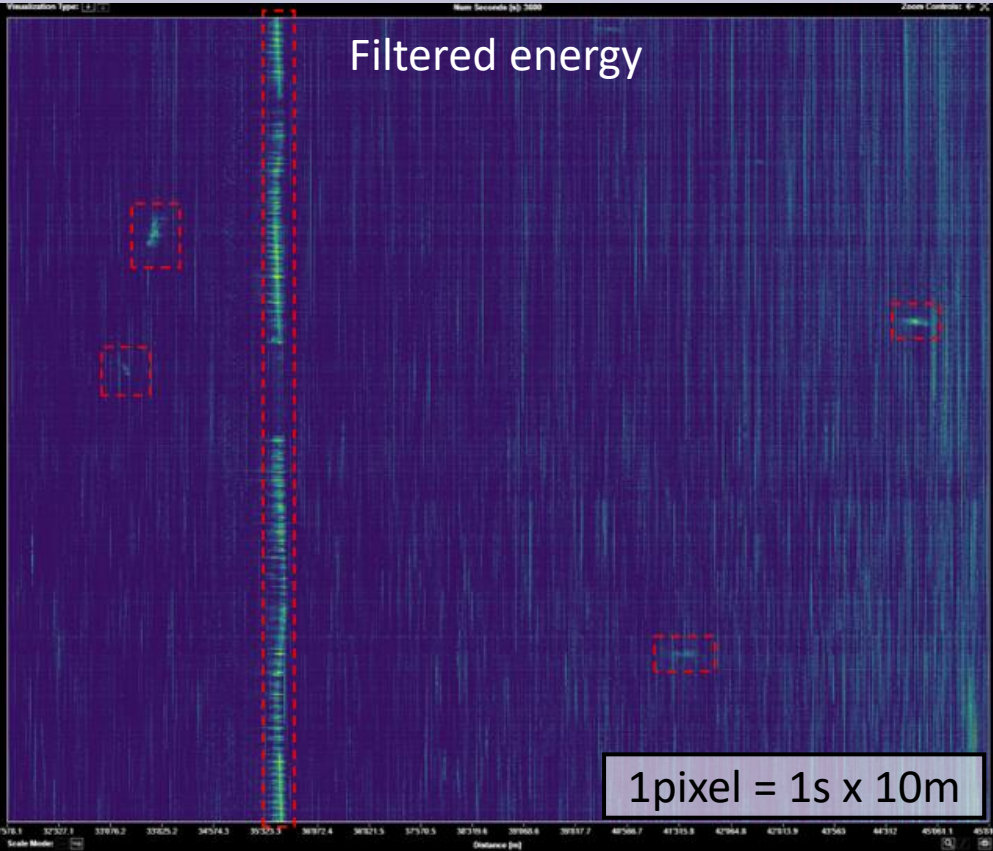
Distance along the fiber

# Offshore anomaly detection

Time



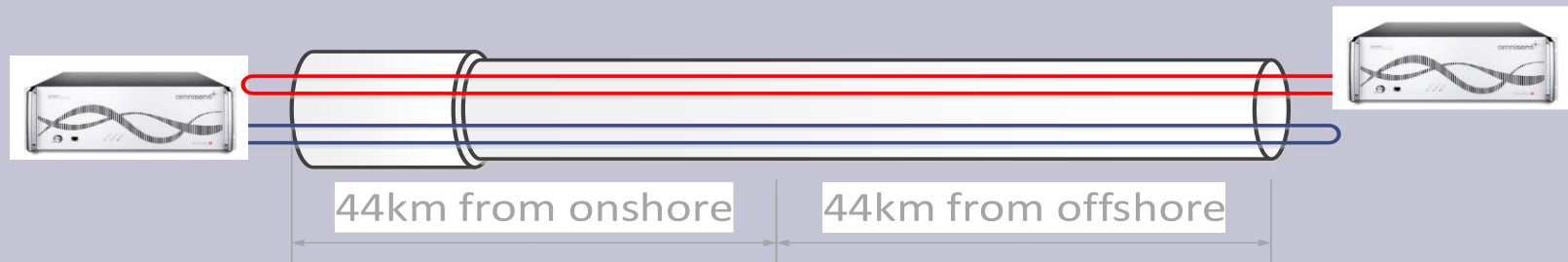
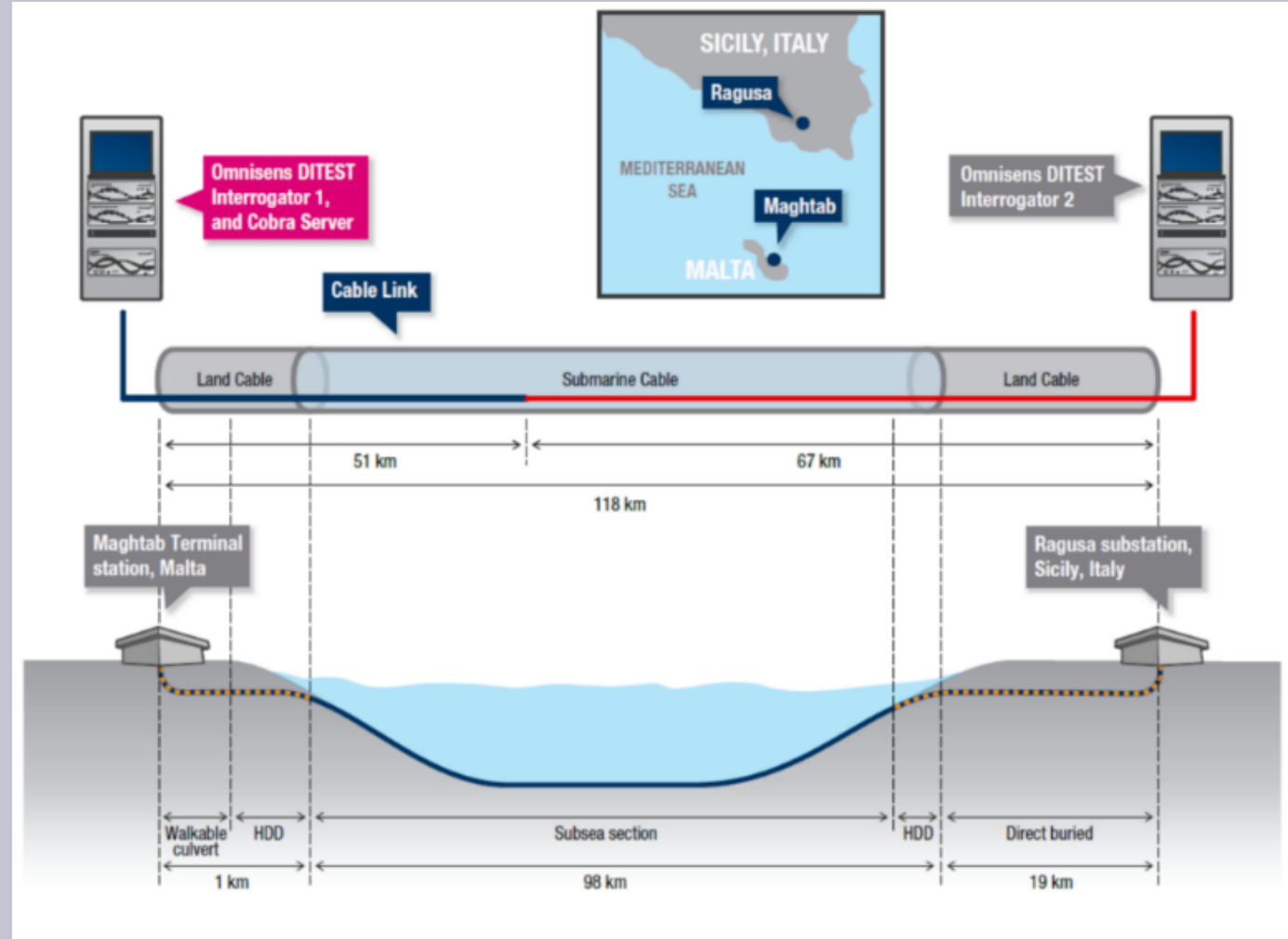
Distance along the fiber



Distance along the fiber

# Inter-island connection

- 120km
- Loop in subsea joint
- 1°C repeatability, 5m SR, 20min



# Thank you

Alexandre Goy

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The logo for EOSS, featuring the letters 'EOSS' in a bold, white, sans-serif font. The letters are closely spaced and have a slight shadow effect, giving them a three-dimensional appearance as if they are floating above a dark surface.