ADVANCING ENGINEERED CONSTELLATION FIBRE PLUS INTEGRATED BOREHOLE SURVEY DESIGN FOR DETECTION OF MIGRATING CO_2 ON FAULT PLANES AT SULCIS FAULT LAB

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Silixa's technology – key differentiators

- iDAS – intelligent Distributed Acoustic Sensor
  - Amplitude, Frequency and Phase of the acoustic vector
  - Wide dynamic range ensures recognition of diverse range of events
  - Measurements possible on both SM and MM fibre optic cables enabling the use of legacy fibres

- DTS – Distributed Temperature Sensor
  - Thermal profiling with high precision over long ranges
  - Spatial resolution
  - Both SM and MM systems are available
  - Temperature resolution over long measurements

- Continuous SNR Improvement through optimisation of optoelectronics and **light management**

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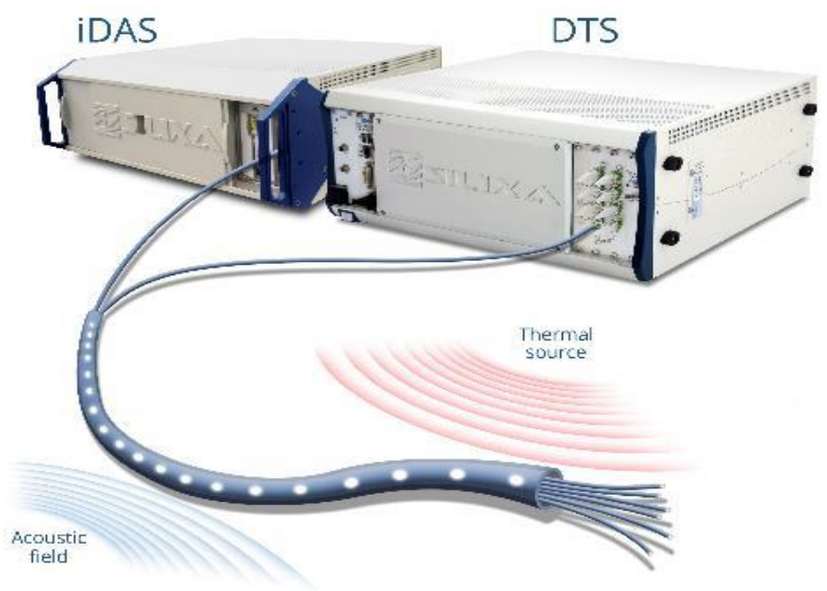
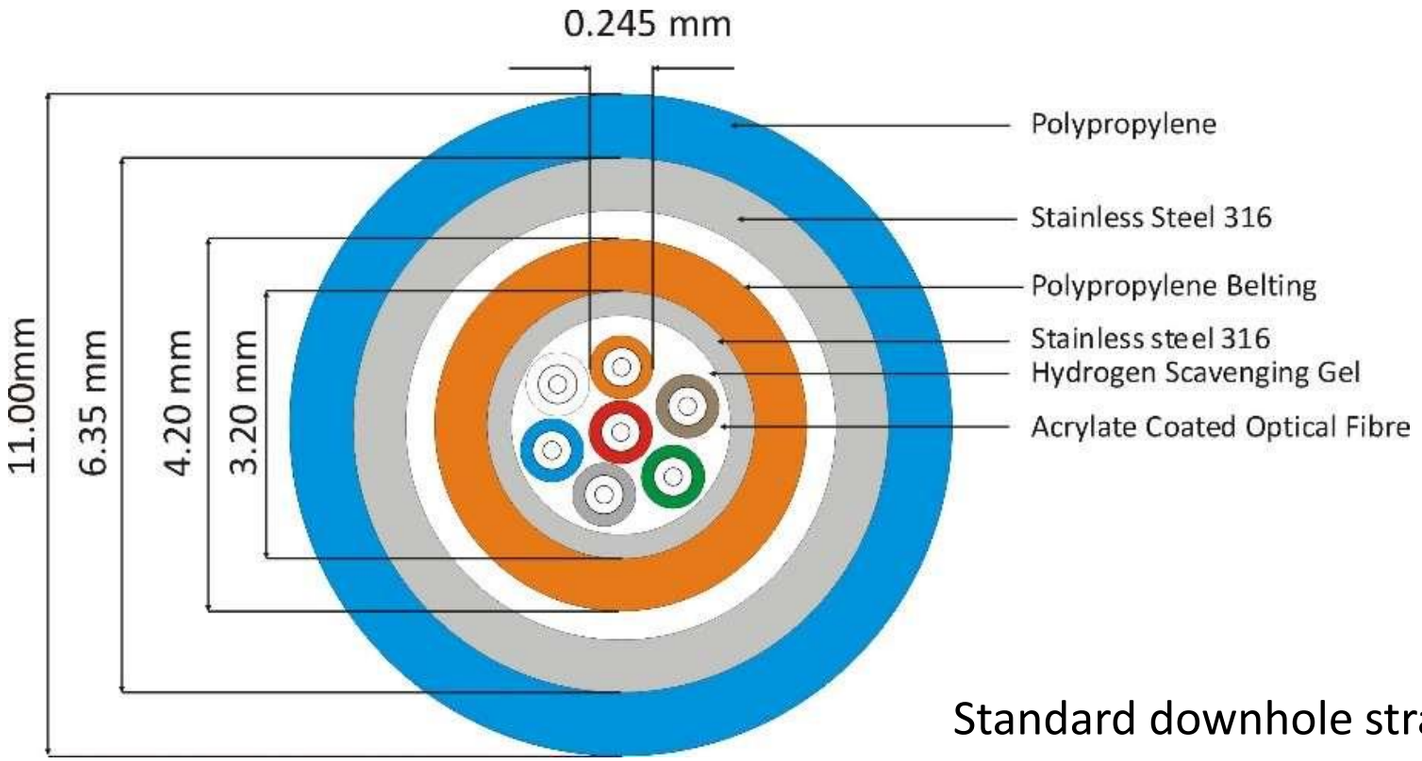


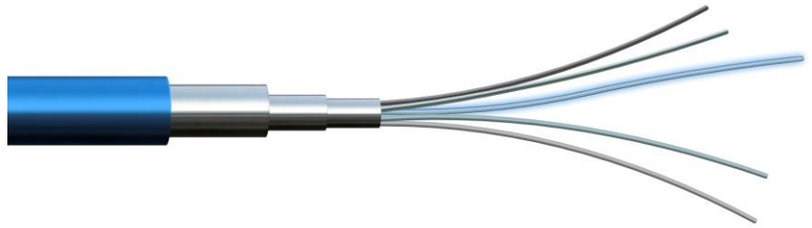
Optical Fibre Cable



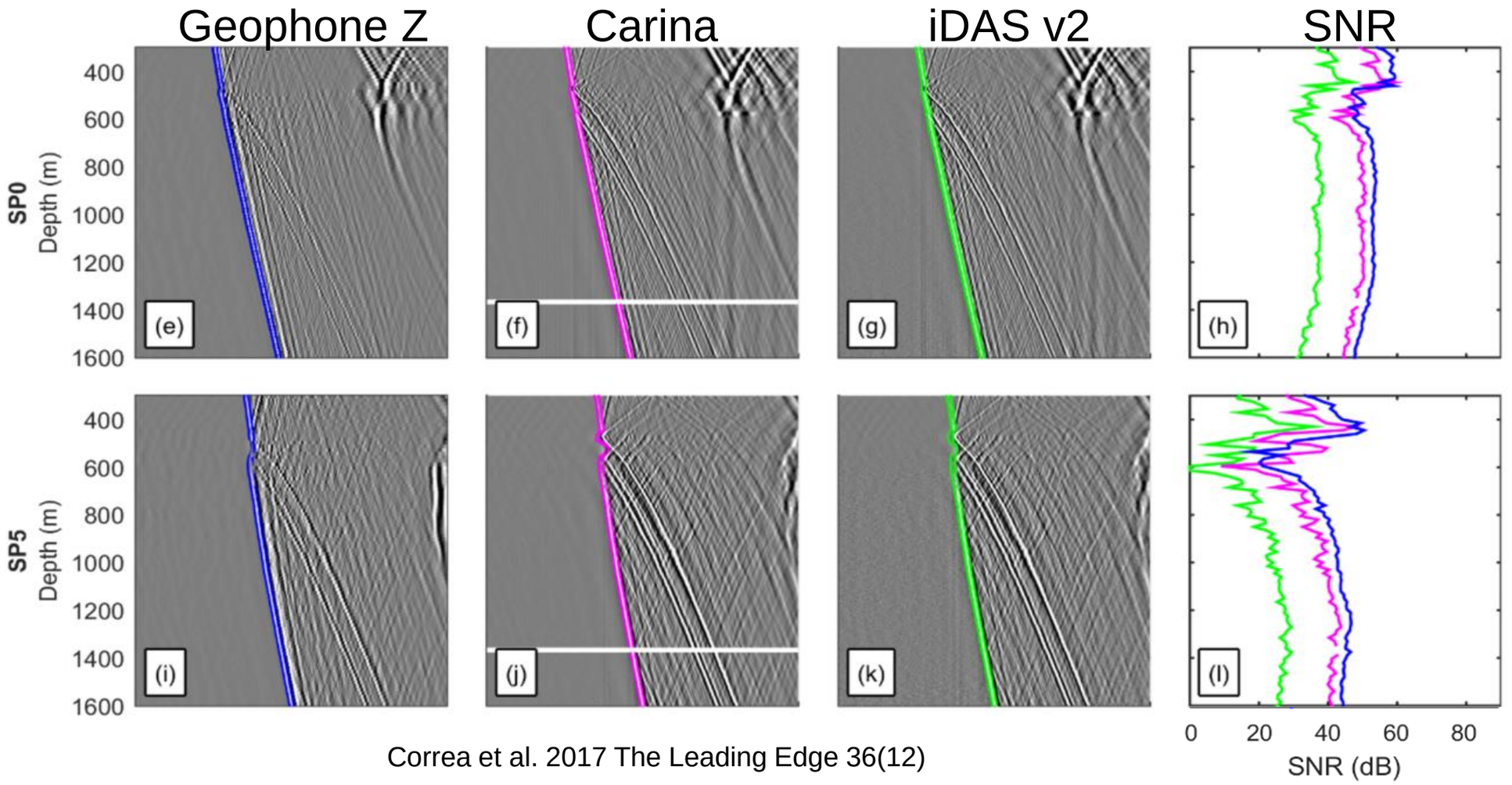
Standard downhole straight cable

Carina System

- DAS SNR is largely governed by how much light can be usefully collected from the optical fibre
- We want low loss fibre – to achieve *long range*, but high scattered fibre – to get *more signal*
- This apparent contradiction is overcome by engineered fibre without introducing significant excess loss in the forward propagating light (Constellation fibre)
- The new iDASv3 interrogator provides enhanced measurement with standard fibre, but gives a step change improvement (more than x100) with new engineered fibre
- The SNR improvements are transformative for DAS applications



Comparison with standard DAS and Geophones



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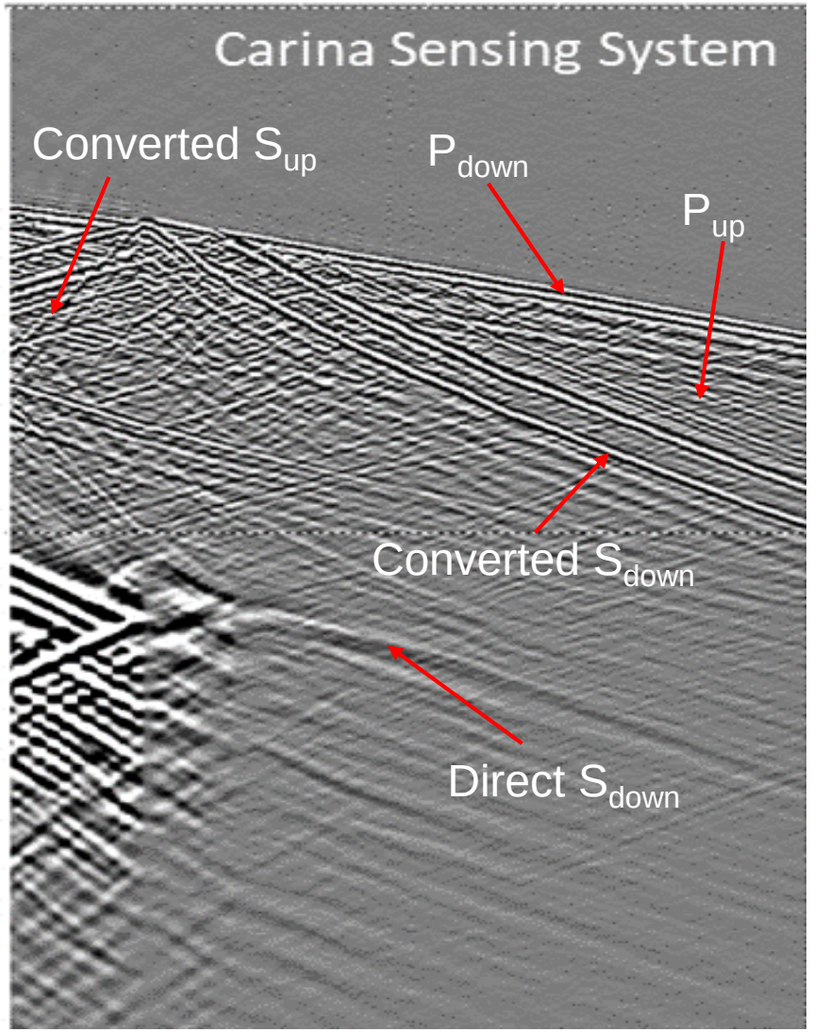
- Co-located fibre and wireline geophones
- Fibre cemented behind casing
- Carina matches performance of geophones
- Finer spatial sampling on DAS gives more detailed velocity information compared to geophones

Seismic Recording

- High quality, fine spatial resolution data recorded across entire wellbore for every shot
- Fine spatial resolution allows recording of slow moving waves
- Recording of P and S waves
- 1-component measurement but separation can be achieved by velocity filtering
- Extremely high signal to noise ratio gives seismic data quality beyond that of a standard geophone array



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Enabling Onshore CO_2 Storage

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