Frauscher Tracking Solutions FTS

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The Principle of Distributed Acoustic Sensing (DAS)
FTS-FAS System

- Covering 80 km of fibre
- Spatial resolution of 10 m
- 2,500 pulses per second in each direction
- Zones possible
TRANSMISSION

INFLUENCED BY:

- Location of fibre
- Location of impact
- Ground conditions
- Weather & climate
**CABLE**

- Fibre is the sensor
- Fibre and cable structure effect the detection capability
DETECTION

- Based on the Signal
- Based on the Transmission
- Based on the Sensor (fiber optic cable)
- Transforming laser impulses to digital data
- Emerging technology
DATA PROCESSING / CLASSIFICATION

1000 km of track generates 27.25 TB of data / hour

Combination of distributed and centralised processing
Data analytics using AI
APPLICATION INTERFACE

PROCESSING / CLASSIFICATION

- Algorithm
- Artificial Intelligence
- Real time fusion with data from other sensors
- Local extraction of information for distributed or centralised processing.

INTERFACE OPTICAL UNIT

Basic signal processing
FTS Projects

- CSX | US
- BART | US
- BNSF | US
- Vale | BR
- MRS | BR
- Rumo | BR
- Network Rail | UK
- LU | UK
- SNCF | FR
- RATP Paris | FR
- ADIF | ES
- DB VDE | DE
- DB Vogtland | DE
- DB Munich | DE
- ÖBB | AT
- Belarusian Railways | BY
- TCDD | TR
- Perception | CN
- South Eastern Rail | IN
- Dubai Metro | UAE
- Queensland Rail | AU

- Train Tracking
- Asset Condition Monitoring
- Security
FTS – Frauscher Tracking Solutions
Current capabilities
Asset Condition Monitoring

Monitor track condition

- Rail defects
- Rail fixing
- Track bed
- Flat wheels
- Catenary flashover
- Rock fall
Rail defect
FTS approach
Rail defect

FTS capabilities

- Locating broken rails within a 30-40 m range
- Prevent derailments
- No extra equipment in the track necessary
Flat wheel
FTS approach
Catenary flashover
FTS approach

- Detection of
- Sound created by the flashover
- Mechanical vibrations of the pylons and catenary system
Catenary flashover FTS capabilities

- Location of flash-overs up to 10 m accuracy
- V-Pattern clearly visible due to sound propagation of pop
- Place and time of flash-over indicated at tip of V-Pattern
- Speed of propagation: 340 m/s (speed of sound)
Digitization strategy in infrastructure

- Providing more information, supporting digitization strategies
  - Trains (location, speed, direction, status)
  - Monitor infrastructure
  - Provide event alarms
  - Analyzing data for predictive information
  - …
- Reduction of components in the field
- Reducing cable
- Reducing maintenance
Emerging technologies are technologies that are perceived as capable of changing the status quo. They are relatively undeveloped in terms of their optimum performance. These technologies will alter the way we go about business.

DAS in Rail is an emerging technology