Case Study of Fiber Optic Sensors in Norwegian Engineering

Overview

The European project SUBMERSE demonstrates how submarine fiber cables can act as scientific instruments in seismology, oceanography and marine biology, while also warning against cable intrusions. Nordic NRENs and NORDUnet play leading roles. This report provides an overview of monitoring technologies for CO2 storage being considered in the ACT SHARP Project. SHARP is a research project funded under the ERA-NET ACT programme for accelerating Carbon Capture and Storage (CCS). The appeal of DTS and DAS data is. The current study investigates the feasibility and performance of Fiber Bragg Grating (FBG) optical sensors in geotechnical engineering applications, aiming to demonstrate their broader applicability across different scales, from controlled laboratory experiments to real-world field. Conventional measurement systems: usually based on electronic sensors. Limitations: temperature, complexity, cost. Raman: inelastic scattering, interaction with molecular vibration and rotation.

Article Content

A review of fiber optic sensing in geomechanical applications at ...

The application of fiber optic sensing (FOS) in geomechanics has seen a significant rise, both in laboratory and field settings, showing a broader trend of integrating advanced sensing

Optical Fiber Sensors and Sensing Networks: Overview

Optical fiber sensors present several advantages in relation to other types of sensors. These advantages are essentially related to the optical fiber

Advanced Fiber-Optic Sensors in Civil Engineering

Dear Colleagues, Optical fibers are increasingly used in all technical fields, including civil engineering. The rapid development of fiber-optic technologies enables the application of the fiber-optic sensors in

Monitoring bands during the Norwegian national day parade: a case

In this study, tracks were achieved for large groups of people, like the parade on May 17, using an existing fiber optic cable network, but individual pedestrians were not observed.

Fiber Optic Shape Sensors: A comprehensive review

Abstract Fiber Optic Shape Sensing is an innovative Optical Fiber Sensing Technology that uses a fiber optic cable to continuously track the 3D shape and position of a dynamic object (with

Review of the usage of fiber optic technologies in electrical power ...

This article provides an overview of fiber optic technology applications in the broad field of electrical power engineering. Various constructions of power transmission lines integrated with

Application of machine learning in optical fiber sensors

Its impact extends beyond enhancing sensor performance by introducing innovative problem-solving approaches. Specifically, ML algorithms have become instrumental in signal

Distributed fiber optic sensors for tunnel monitoring: A state-of-the ...

Distributed fiber optic sensors (DFOSs) possess the capability to measure strain and temperature variations over long distances, demonstrating outstanding potential for monitoring

Optimizing Fibre-Optic Monitoring: A Case Study in the Norwegian

We use examples from the Norwegian North Sea case study area to show how a ''right-time and right-place detection'' system could work, utilizing both conventional data but especially new emerging FO

Applications of Optical Fiber Sensors in Geotechnical

The current study investigates the feasibility and performance of Fiber Bragg Grating (FBG) optical sensors in geotechnical engineering applications,

Bridge monitoring by fiber optic deformation sensors: a case study

After a short overview of optic fiber sensors and the related state of the art the application on the case study will be presented, describing the main features of the system and discussing the ...

(PDF) Distributed fiber optic sensors for tunnel

Distributed fiber optic sensors (DFOSs) possess the capability to measure strain and temperature variations over long distances, demonstrating

A review of previous studies on the applications of fiber optic sensing ...

Recently, fiber optic sensing technologies have been successfully applied in geotechnical monitoring due to the significant advantages of anti-electromagnetic interference, stable signal long

Distributed Optical Fiber Sensors for Monitoring of Civil

Distributed Fiber Optics Sensing (DFOS) is a mature technology, with known, tested, verified, and even certified performance of various interrogators

Applications of fiber optic sensors in civil engineering

This paper provides a review of recent developments in fiber optic sensor technology as well as some applications of fiber optic sensors to the performance monitoring of civil infrastructures

Optical fiber sensors for static and dynamic health monitoring of civil ...

Optical fiber sensors for static and dynamic health monitoring of civil engineering infrastructures: Abode wall case study Paulo Antunes a b, Hugo Lima a b, Humberto Varum c, Paulo

Capabilities of Fiber Optics Deployed at Seabed for ...

The present research focuses on the NL (Northern Lights) case study (offshore Norway), aiming to assess the advantages of utilizing fiber optics in comparison to an array of land-based sensors

Fiber-optic technologies and methods for downhole monitoring

Sensor cable: Protect fiber from mechanical and chemical influences. Steel tube, with additional jacketing (plastic, steel). May contain several fibers for different sensing techniques. Cable clamps:

Application of Optical Fiber Sensors in Civil Engineering

In this chapter, optical fiber sensors (OFSs) are introduced in various infrastructure applications, such as infrastructure for highways, buildings, bridges,

Optimizing fibre-optic monitoring: A case study in the Norwegian North ...

Dive into the research topics of ''Optimizing fibre-optic monitoring: A case study in the Norwegian North Sea: Deliverable 4.4''. Together they form a unique fingerprint.

APPLICATION AND DEVELOPMENT OF FIBER OPTIC

This demonstrates that fiber optic sensors show high sensitivity and accuracy in strain, stress, temperature measurement in several structures.

Measurement of cable forces for automated monitoring of engineering ...

This study reviews the existing studies and recent advancement of fiber optic sensors for measuring cable forces, aiming to provide a guide for practical engineers to understand the sensor

(PDF) Optical Fiber Sensors: Working Principle,

Brief theory of sensing principle, fabrication method, applications, advantages and disadvantages of the different fiber-optic sensors, are addressed.

Optical fiber sensors in infrastructure monitoring: a comprehensive ...

Abstract The purpose of this article is to review and further promote the application of optical fiber sensor technology in infrastructure monitoring. Compared with traditional sensors, optical

Turning fiber cables into a scientific sensor

Nordic NRENs and NORDUnet play leading roles. Deployment and maintenance of scientific sensors in the oceans is costly. This has created

The Role of Fiber Optic Sensors for Enhancing Power System

The integration of low carbon technologies and more efficient power system operation are key components in the transition to a sustainable future. To support this, power system operators

(PDF) Fiber Optic Sensors and Their Applications

Rockbolts instrumented with distributed fiber optic strain sensors were used to study rockbolt strain distribution, load mobilization, and localized

Artificial Intelligence and Machine Learning in Optical

The integration of artificial intelligence (AI) with optical fiber sensing (OFS) is transforming the capabilities of modern sensing systems, enabling

A Real-Time Fiber Optical System for Wellbore Monitoring: A Johan ...

Equinor has addressed these decision-making shortcomings by building a real-time streaming solution for transferring, processing, and interpretation of its FO data at the Johan

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