

Distributed Fiber Optic Sensor Patent



Summary of Content

Distributed fiber optic sensor (DFOS) patents cover systems and methods for detecting environmental changes, strain, vibration, and temperature along optical fibers using intrinsic scattering properties and interferometric techniques.

Key Patents and Innovations

GB2222247A describes a method for sensing environmental parameters using the intrinsic scattering properties of optical fibers. The system transmits light pulses of different frequencies along the fiber, and interference signals generated from scattered light at different locations are detected and processed to derive information about changes in environmental conditions. This approach eliminates the need for semi-reflecting splices and allows interferometric interrogation of specific fiber sections . EP2596387 and US9170149B2 focus on improving the linearity and accuracy of DFOS systems. These patents describe systems that measure Rayleigh backscatter from optical fibers to detect strain or vibration. The innovations include coherent detection, phase difference acquisition, and combining multiple acquisitions to enhance measurement precision. Such systems are particularly useful in monitoring hydrocarbon reservoirs, wellbores, and other industrial applications where accurate distributed sensing is critical . US12618696 extends DFOS applications to telecommunications and security. It leverages relative phase shifts in Rayleigh, Brillouin, and Raman scattering to detect fiber strain, temperature changes, acoustic effects, and vibrations. The patent also addresses integration challenges, such as providing alerts to devices across different networks when a fiber risk is detected, enabling real-time monitoring and protection of fiber infrastructure .

Technical Highlights

Article Content

DISTRIBUTED FIBER OPTIC SENSOR SYSTEM WITH IMPROVED

When impulsive sources are used, optical signals captured from a fiber optic sensor during seismic monitoring can be

A compatible distributed optical fiber sensing system based ...

A compatible distributed optical fiber sensing system based on spatial division multiplexing Raman anti-stokes

U.S. Patent for Distributed fiber optic sensor system with improved ...

To measure vibration or strain, distributed fiber optic sensing systems typically measure the amplitude of Rayleigh

U.S. Patent for Method of making a distributed optical fiber sensor ...

A method of making an optical fiber sensor device for distributed sensing includes generating a laser beam

What is Fiber Optic Sensing?

Distributed Temperature Sensing (DTS), Distributed Temperature and Strain Sensing (DTSS) and Distributed Acoustic Sensing

CA2571515A1

A distributed optical fiber sensor capable of measuring strain and/or temperature with high accuracy and high spatial resolution

US11946799B2

A distributed fiber-optic acoustic sensing system and a signal processing method. The distributed fiber-optic acoustic sensing system

Distributed fiber-optic intrusion sensor system

Distributed fiber-optic intrusion sensor system Abstract: A distributed sensor system for detecting and locating intruders based on the

WO2021147216A1

A distributed optical fiber acoustic sensing system. On the basis of a distributed optical fiber acoustic sensor having high spatial

Stretchable distributed fiber-optic sensors | Science

Colorful changes Distributed fiber-optic sensors have been used for monitoring mechanical deformations in stiff

CONDITIONAL ACOUSTIC LIBRARY GENERATION FOR DISTRIBUTED FIBER OPTIC SENSOR

In an embodiment, memory devices 403 store program code for implementing one or more functions of the systems

Distributed optical fiber sensors: what is known and what is to come

This perspective article delves into the current performance limitations of distributed optical fiber sensors and proposes avenues for

Distributed Optical Fiber Sensor for Dynamic Measurement

Distributed optical fiber sensors (DOFS), which can distributed measure static parameters such as temperature and

Systematic review of fiber-optic distributed acoustic sensing ...

This capability transforms conventional optical fibers into continuous, highly sensitive sensor arrays. Distributed

Distributed fibre optic sensor system

Distributed fibre optic sensor system Abstract Changes in environmental parameters are sensed transmitting pulses of light which

High-Performance Distributed Brillouin Optical Fiber Sensing

This paper reviews the recent advances on the high-performance distributed Brillouin optical fiber sensing, which

WO/2025/108757 DETECTION METHOD AND SYSTEM FOR

The invention provides a method and system for detecting a signal response in distributed optical fibre sensing data.

Status and future development of distributed optical fiber sensors for ...

According to our perspective, the research on distributed fiber optic sensors has significantly advanced in monitoring

(12) United States Patent (10) Patent No.: US 9,170,149 B2

To measure vibration or strain, distributed fiber optic sensing systems typically measure the amplitude of Rayleigh backscatter

Distributed fiber optic sensor system with improved linearity

To measure vibration or strain, distributed fiber optic sensing systems typically measure the amplitude of Rayleigh backscatter

Distributed fiber-optic sensors | Springer Nature Link

Optical fiber sensors have been researched now for a number of years and a wide body of knowledge has been accumulated as

WO/2012/030814 DISTRIBUTED FIBER OPTIC SENSOR SYSTEM

A phase detection and acquisition system determines a phase difference between first and second locations along the

DISTRIBUTED FIBER OPTIC SENSOR SYSTEM WITH IMPROVED

This signal, while useful for detecting events, has a strain-optical signal transfer function that is both highly non-linear and unpredictable.

Distributed Fiber-Optic Sensors: Principles and Applications

Optical fiber sensors have been researched now for a number of years and a wide body of knowledge has been accumulated, as

A Review of Multiparameter Fiber-Optic Distributed Sensing ...

In , Sheng et al. proposed a multiparameter distributed fiber-optic sensor for the simultaneous monitoring of

4354091 DISTRIBUTED OPTICAL FIBRE SENSOR

This patent search tool allows you not only to search the PCT database of about 2 million International Applications but also the

CA2571515A1

Distributed optical fiber sensor Abstract A distributed optical fiber sensor capable of measuring strain and/or temperature with high

A Review of Multiparameter Fiber-Optic Distributed Sensing ...

By critically analyzing the capabilities, limitations, and future trends in fiber-optic multiparameter sensing, this paper

1 DISTRIBUTED FIBER OPTIC SENSOR SYSTEM WITH

R.J. Posey, G.A. Johnson, and S.T. Vohra, Rayleigh Scattering Based Distributed Sensing System for Structural Monitoring, 14th

Distributed Fiber-Optic Sensor for Dynamic Strain Measurement

A novel Brillouin-based distributed sensing technique is presented that can obtain the strain profile of the entire sensing fiber with a

Distributed fiber sensor network using telecom cables as sensing

Distributed fiber optic sensing (DFOS) is a rapidly evolving field that allows the existing optical fiber infrastructure for

Optical Fiber Distributed Acoustic Sensors: A Review

Fiber-optic distributed acoustic sensor (DAS) is one of the most attractive and promising fiber-optic sensing

DISTRIBUTED OPTICAL FIBRE SENSOR

U.S. Patent Application US20250216248A1 for a distributed optical fiber sensor is described to measure parameters as functions of

Optical Fiber Technology | Distributed Fiber Optic Sensing ...

This turns an entire optical fiber into a sensing system. In comparison with other sensing technologies, distributed fiber

U.S. Patent for Distributed fiber optic sensor system with improved ...

A phase detection and acquisition system determines a phase difference between first and second locations along the

Method and system for distributed fibre optic sensing

The present disclosure generally relates to a method and system for distributed fibre optic sensing in particular across

In-Depth Overview of Fiber Optic Temperature Sensors

2. Working Principles Fiber optic temperature sensors operate based on changes in light properties as it travels through the fiber.

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://benniedesignstudio.co.za>

Email: sales@benniedesignstudio.co.za

Phone: +27 82 391 4765

Address: The Towers, 1 St Georges Mall, Cape Town, 8001, South Africa

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