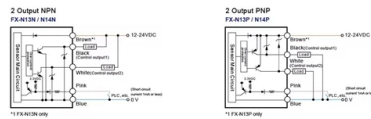


Fiber Optic Pressure Sensor Fringe Interference



Overview

Interferometric sensors: Based on the Mach-Zehnder or Fabry-Pérot interference principles, pressure-induced optical path length differences alter interference fringes, enabling pressure estimation. Fiber-optic sensing (FOS) technology has emerged as a cutting-edge research focus in the sensor field due to its miniaturized structure, high sensitivity, and remarkable electromagnetic interference immunity. Compared with conventional sensing technologies, FOS demonstrates superior capabilities in. Fiber-optic sensors have transformed how we monitor the integrity of skyscrapers, the safety of aircraft, and even human vital signs. These intricate bands of light and dark, born when light waves. Lang Bai, Gang Zheng, Bin Sun, Xiongxing Zhang, Qiming Sheng, Yuan Han; High-precision optical fiber pressure sensor using frequency-modulated continuous-wave laser interference. AIP Advances 1 February 2021; 11 (2): 025038.



Article Content

Jun 01, 2026

Fiber-Optic Pressure Sensors: Recent Advances in

Interferometric sensors operate based on the principle of optical interference. When pressure is applied, it alters either the cavity length or the

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Sapphire Fiber Fabry-Perot Sensors With High Fringe Visibility

It is difficult for sapphire fiber Fabry-Perot (FP) sensors to generate high quality interference fringes because their highly multimode property. In this paper, we report a sapphire fiber FP strain sensing

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Research Progress on F-P Interference—Based Fiber-Optic Sensors

The RI of liquids and solids can be obtained by monitoring the fringe contrast related to Fresnel reflections, while the ambient temperature and small displacement can be obtained by

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What is Fiber-optic Pressure Sensors?

Interferometric sensors: Based on the Mach-Zehnder or Fabry-Pérot interference principles, pressure-induced optical path length differences alter

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Learn how fiber sensors detect changes in physical, chemical, or biological parameters by detecting changes in the light transmitted through an optical fiber.

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Fiber-Optic Pressure Sensors: Recent Advances in

Abstract Fiber-optic sensing (FOS) technology has emerged as a cutting-edge research focus in the sensor field due to its miniaturized structure, high sensitivity,

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Temperature self-compensation fiber-optic pressure sensor based on ...

Therefore, we can integrate the advantages of EFPI pressure and FBG temperature sensors to realize a pressure-temperature multiplexing structure in a single optical fiber. In this

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A fiber optic temperature sensor based on interference fringe contrast ...

Abstract We propose and verify a fiber optic temperature sensor whose demodulation method is measuring the spectra contrast, which is quantified by the amplitude of the fast Fourier

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Fiber Bragg grating pressure sensors: a review

Fiber Bragg grating (FBG) pressure sensors have the potential to replace conventional voltage sensors due to their compact size, resistance to

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Fiber Optic Pressure Sensors: Ultimate Guide

Fiber Optic Pressure Sensors are a type of sensor that offers high accuracy, reliability, and immunity to electromagnetic interference. They have a wide range of applications in optical instrumentation,

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High-precision optical fiber pressure sensor using frequency

This work presents a high-precision fiber optic pressure sensor based on frequency-modulated continuous-wave (FMCW) laser interference. The pressure sensor is primarily composed

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High-precision optical fiber pressure sensor using ...

This paper described an FMCW laser interference fiber optic pressure sensor. The diaphragm-type F-P cavity pressure sensor structure was made of SUS631 stainless steel with good elastic properties.

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Interferometric Fiber Optic Sensor

Interferometric fiber optic sensors (FOSs) are local sensors that measure changes at specified points in a structure by detecting optical phase changes in light propagating through optical fibers, resulting in

Mar 14, 2026

Strain force sensor with ultra-high sensitivity based on fiber inline ...

A novel all-silica fiber optic Fabry-Perot (FP) pressure sensor with pressure leading-in tube based on microbubble structure is developed and experimentally demonstrated.

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(PDF) Dynamic high-pressure calibration of the fiber

Next, we compared the characteristics of the fiber-optic sensor with the responses of a calibrated piezoelectric dynamic pressure sensor at an operating

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Exploring how interference fringe patterns in fiber-optic sensors transform structural monitoring, healthcare, and aerospace safety through advanced interferometry.

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Abstract Based on the theory of multimode interference (MMI) and self-image formation, we developed a novel intrinsic optical fiber pressure sensor. The sensing element consists of a

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Draw-tower grating: Inscribes gratings during fiber manufacturing for high mechanical stability. Applications in Sensing and Telecommunications FBGs are widely used as strain, temperature, and

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Research Progress on F-P Interference—Based Fiber-Optic Sensors

The fiber-optic function sensor of the is proposed determined F-P interference-based by the structure of fiber-optic its sensing sensor head, is which determined will be by discussed the structure ...

Mar 02, 2026

Research Progress on F-P Interference—Based Fiber

We review our works on Fabry-Perot (F-P) interferometric fiber-optic sensors with various applications. We give a general model of F-P interferometric optical fiber

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Underwater fiber-optic salinity and pressure sensor ...

In this paper, an underwater fiber-optic sensor based on surface plasmon resonance (SPR) and multimode interference (MMI) is presented for simultaneous measurement of salinity and

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Analysis of the Sapphire Fiber Fabry-Perot Interferometer Fringe ...

The results showed that different numbers of modes were excited in sapphire fibers under different excitation conditions and finally affected the fringe visibility of the SFPI. The fiber collimator excited

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