Demodulation of Fiber Optic Sensor Array

Overview

This paper presents a method that integrates neural networks with arrayed waveguide gratings (AWGs) for the demodulation of fiber-optic sensors based on the Vernier effect and a novel, to our knowledge, Fabry–Pérot (FP) strain sensor structure. For backscattering-based systems—encompassing Raman, Brillouin, and. Distributed fiber optic sensing (DFOS) has emerged as a critical technology for structural health monitoring of large-scale infrastructure, offering unique advantages in terms of coverage and environmental adaptability. This review presents a comprehensive analysis of the two dominant technical. The Sagnac interferometer-based fiber-optic hydrophone (S-FOH) exhibits a frequency-dependent response, causing the output signal to deviate from the original acoustic signal, with severe cases leading to signal distortion. A high-power amplified spontaneous emission (ASE) source served as the broadband detection light. The spectrum generated by the dispersion of.

Article Content

Mar 23, 2026

Self-Attention AI Model for Practical Sensor Networking: Demodulation ...

This article proposes a cost-effective solution for interrogating long-period fiber grating (LPFG) sensors using an optical fiber sensor

Jul 31, 2025

(PDF) Highly robust demodulation algorithm for fiber optic ...

We propose a phase demodulation algorithm in interferometric fiber-optic sensing systems based on 3 × 3 coupler

Mar 13, 2026

High Resolution and Speed Demodulation for Optical Fiber

To get rid of the dilemma between the speed and the resolution of optical fiber Fabry–Perot (F-P) magnetic field

Jul 26, 2025

A Novel Demodulation Method of Fiber Bragg Grating Sensor Array

We propose a novel demodulation method of strong FBG sensor array based on wavelength-to-time mapping and multiloop OEO.

Nov 28, 2025

High precision and low noise demodulation scheme using adaptive

The adaptive FFT demodulation scheme shows promising potential for applications in low noise, high precision, and

Jan 11, 2026

Phase Interrogation of Fiber-Optic Interferometric Acoustic/Vibration ...

Demodulating interferometric optical fiber sensors within restricted spectral ranges [where the spectrum fails to cover

Jul 13, 2026

A hybrid demodulation algorithm with high-sensitivity and wide-range ...

This paper presents a novel hybrid demodulation scheme for quasi-distributed fiber-optic acoustic sensor utilizing ultra

Jun 22, 2026

Demodulation of fiber-optic Fabry-Perot sensors through a double ...

Abstract For the cavity length demodulation of fiber-optic Fabry-Perot (FP) sensors, a frequency-doubled self-correlation

Aug 07, 2025

Crosstalk and methods for its reduction in the inline fiber optic ...

Conventionally, the inline fiber optic sensor arrays are used in geophysical explorations, underwater security systems,

Aug 15, 2025

Optical Vernier effect-based demodulation system for

This paper presents a method that integrates neural networks with arrayed waveguide gratings (AWGs) for

Jan 29, 2026

Research on Demodulation System and Algorithm of Distributed Fiber ...

An improved demodulation scheme is proposed for PMDI-TDM based fiber-optic sensor array, which tracks the

Dec 03, 2025

Ultrahigh-speed phase demodulation of a Fabry–Perot sensor based

Abstract and Figures An ultrahigh-speed phase demodulation system was designed for the Fabry–Perot (F–P)

Jan 27, 2026

Fiber optic sensor arrays: a new method to improve multiplexing ...

This technique, extensively used in radar applications, is based on the amplitude modulation of the emitted signal

Sep 29, 2025

Super-Resolution Demodulation of Fiber Sensor Arrays

This Letter presents an approach to produce multiplexable optical fiber chemical sensor using an intrinsic Fabry-Perot

Feb 22, 2026

High-Speed Demodulation of weak FBGs Based on Microwave

In this Letter, we propose a high speed quasi-distributed demodulation method based on the microwave photonics and the chromatic

Feb 20, 2026

A Novel Phase Demodulation Method and Simulation for Fiber-Optic ...

Sufan Yang, Chunxi Zhang, and Xiaxiao Wang Abstract Fiber-optic distributed acoustic sensors (DASs) can be used for various

May 01, 2026

Deep learning-based phase demodulation for distributed acoustic

Accurate demodulation is essential for a deeper understanding of the physical processes in fiber optic sensing

Jun 03, 2026

Fiber optic sensing demodulation utilizing optical vector analysis ...

In this paper, we propose and experimentally demonstrate a high-resolution sensing demodulation technique using

Jan 30, 2026

(PDF) Low harmonic distortion demodulation scheme for PMDI-TDM ...

This paper proposes a low harmonic distortion signal demodulation scheme for PMDI-TDM structure fiber-optic sensor

Jun 08, 2026

Distributed optical fiber sensing: Review and perspective

This work is focused on a review of three types of distributed optical fiber sensors which are

Dec 14, 2025

Demonstration of Eight-Sensor Sagnac Fiber-Optic Hydrophone Array

An eight-sensor S-FOH array featuring an alternative quadrature phase bias scheme is demonstrated, and

Sep 29, 2025

Ultrahigh-speed phase demodulation of a Fabry–Perot sensor based

An ultrahigh-speed phase demodulation system was designed for the Fabry–Perot (F–P) interferometric sensor based

Mar 16, 2026

High-speed spectrum demodulation of fiber-optic Fabry–Perot sensor ...

In conclusion, we proposed a high-speed spectrum demodulation method with a large dynamic range for fiber-optic F-P

Jun 28, 2026

Interferometric Fiber-Optic Vibration Sensor Array With Improved ...

A novel scheme for improving the vibration response bandwidth of interferometric fiber-optic sensor (IFOS) array is proposed and

Feb 19, 2026

Phase-shifted demodulation scheme for fiber-optic interferometric ...

Fiber-optic interferometric sensors (FOISs) based on multiple-beam interference principle have been applied to many

Jun 10, 2026

Advanced Demodulation in Distributed Fiber Optic Sensing: A ...

This review systematically summarizes advanced demodulation and signal processing strategies designed to

Dec 24, 2025

Demodulation algorithm for optical fiber fabry-perot interference sensor

Abstract. In view of resolution of optical fiber Fabry-Perot (FP) interference sensor, this paper analyses and researches high

Oct 11, 2025

Advanced Demodulation in Distributed Fiber Optic Sensing: A Review

By synthesizing recent advances in modulation schemes, detection hardware, and algorithmic processing, this paper outlines the

Contact Us

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

Website: https://iiss.co.za
Email: sales@iiss.co.za
Phone: +27 63 174 2895
Address: Unit 8, Innovation Park, 15 Rivonia Road, Sandton, Johannesburg, 2196, South Africa

This document is for informational purposes only. Specifications subject to change without notice.