Thin Fiber Optic Temperature and Humidity Sensor

Overview

A porous anodic alumina film is proposed to construct an optical fiber temperature and humidity sensor. Renato Faraco Filho, João Gabriel de Carvalho, Luiz David Silva, Enzo Dantas da Silva, Sinei Gonçalves Júnior, Flávio Augusto Marques, Alexandre Cotta, Alexandre Bessa dos Santos, Jonas Henrique Osório and Jefferson E. Optical fiber humidity sensors (OFHSs) offer several advantages over electronic humidity sensors such as miniature design, durability, the possibility of working on flammable environments and at higher temperature and pressure ranges, and, most important, their electromagnetic immunity. The proposed porous anodic alumina. Fiber optic temperature sensors are immune to the many environmental effects that compromise other measurement technologies, can be embedded and installed in locations traditional temperature sensors cannot and deliver an unprecedented level of spatial detail and data without sacrificing precision. We demonstrate an all-fiber, high-sensitivity, dual-parameter sensor for humidity and temperature.

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Article Content

Fiber Optics Technology for Temperature and Humidity Sensor

This chapter reviews optical fiber sensors designed for measuring temperature and humidity, covering their fundamental principles, advanced architectures, and functionalized designs.

Fiber optic integrated FPI sensor for simultaneous measurement of ...

In this paper, a demonstration of a fiber optic sensor for the simultaneous measurement of relative humidity and temperature based on integrated FPIs was proposed.

An optical fiber sensor for measuring temperature and humidity based

This study proposes a fiber-optic vernier sensor composed of two Fabry-Perot interferometers (FPIs) for measuring temperature and humidity. Temperatur

Recent Developments in Fiber Optics Humidity Sensors

The present paper reports the current trends of optical fiber humidity sensors. The evolution of optical structures developed towards humidity sensing,

Optical Fiber Temperature and Humidity Dual

A porous anodic alumina film is proposed to construct an optical fiber temperature and humidity sensor. In the sensor structure, a fiber Bragg grating is

Dual-Sensitive Fiber Optic Humidity and Temperature Sensor Based

This study presents a fiber-optic Fabry–Perot humidity sensor based on a concave-etched graded-index (GRIN) fiber and a thin composite hydrogel diaphragm. The concave cavity is

An Optical Fiber Sensor Based on FeOOH Nanorod Arrays for

In this work, a Mach-Zehnder interferometer (MZI) with “SMF-MMF-TCF-MMF-SMF” structure is proposed to measure ambient temperature and humidity. The FeOOH nanorod arrays

Fiber Optic Temperature Sensing and Measurement

Measure temperature with fiber optic sensors for high-resolution distributed and multipoint monitoring in batteries, processes, and harsh environments.

Non-Adiabatically Tapered Optical Fiber Humidity Sensor with High ...

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We demonstrate an all-fiber, high-sensitivity, dual-parameter sensor for humidity and temperature. The sensor consists of a symmetrical, non-adiabatic, tapered, single-mode optical fiber, operating at the

Ultra-Wide Detection Range of Fiber Optic Temperature

This paper proposed a fiber optic temperature sensor with an ultra-wide detection range based on the polydimethylsiloxane (PDMS) film-coated

Optical Fiber Temperature and Humidity Dual Parameter Sensing

A porous anodic alumina film is proposed to construct an optical fiber temperature and humidity sensor. In the sensor structure, a fiber Bragg grating is used to detect the environment

Low-Coherence Interferometric Fiber Optic Sensor for Humidity

The main aim of this work was the design and development simple fiber optic Fabry-Perot interferometer (FPI) sensor devices for relative humidity (RH) sensing with emphasis on high

Development of fabrication technique and sensing performance of optical ...

In fiber humidity sensors, the evanescent wave is commonly generated in optical fibers with thin diameter, which are prepared by melting-tapering process, chemical corrosion technique,

2D materials coated on etched optical fibers as humidity sensor

As far as we have researched, so far the optical fibers that have been chemically thinned and layered with 2D materials have not been applied as humidity sensor.

Optical fibre sensor for simultaneous temperature and relative humidity ...

An optical fibre sensor has been developed for simultaneous measurement of relative humidity (RH) and temperature at a single optical fibre tip based on the reflected intensity. Combining

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Miniature and high-performance optical fiber relative humidity sensor ...

Abstract A miniature Fabry-Perot fiber-optic sensor is demonstrated for high-performance relative humidity (RH) detection. This sensor is constructed by fusing a single-mode fiber to a small

Optical fibre-based sensor technology for humidity and moisture ...

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Abstract Humidity and moisture sensing is becoming increasingly important in industry and through a wide spectrum of applications and a review of research activity in the field across a range

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