Polarization Current Method Fiber Optic Sensor



Overview

Interferometric fiber optic current sensors (FOCS) employ circularly polarized light traversing a closed loop path around an electrical conductor's current-generated magnetic flux, which reflects off a mirror. Figure 2 shows the principle of the fiber-optic current sensor FOCS. The FOCS can measure uni- or bi-directional DC currents up to 600 kA. Electric current and/or magnetic field fiber optic sensors have been known, developed and commercialized for quite some time for the purposes of the power industry and special applications. These sensors are based either on the Faraday effect in the fiber itself, or in bulk materials. See the author list of “Overview of T and D-T results in JET with ITER-like wall” by CF Maggi et al. to be published in Nuclear Fusion Special Issue: Overview and Summary Papers from the 29th Fusion Energy Conference, London, UK, 16–21 October 2023.

Article Content

Polarimetric Fiber-Optic Current Sensor With Integrated-Optic ...

We report on a simple, metering class polarimetric fiber-optic current sensor (FOCS) for electric power transmission systems. The sensor uses a fiber coil operated in reflection mode and an

Fiber-Optic Current Sensing Based on Reflective Polarization-Bias

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To enhance current sensitivity, a polarimetric method based on a reflective polarization-bias-added (RPBA) structure is presented in this article. First, it is proved by the Jones matrix that

An affordable smartphone interrogatable polarimetric fiber optic ...

In this paper we describe a low cost polarimetric optical fiber sensor based on a BSO magneto-optic crystal and plastic fibers spectrally interrogated with a smartphone.

Measurement of Electric Current using Optical Fibers: A

Based on polarization state error models of Sagnac fiber-optic current sensor, authors made experiments to evaluate performances of several key

Fiber-optic current sensor

Interferometric fiber optic current sensors (FOCS) employ circularly polarized light traversing a closed loop path around an electrical conductor''s current-generated magnetic flux, which reflects off a mirror.

A Spectrally Interrogated Polarimetric Optical Fiber Sensor for Current ...

We report on a study of the temperature dependence of the response of a BSO crystal based polarimetric current sensor with spectral interrogation. Two possible interrogation schemes

Simple High Performance Polarimetric Fiber-Optic Current Sensor ...

A simple optical configuration is proposed, combining the elliptically birefringent fiber and a broad-spectrum light source. An accurate, compact, and robust current monitor is obtained.

Performance Enhancement of the Polarimetric Fibre Optical Current ...

The method requires performing data acquisition at two different input polarisations. Based on these measurements, the optimal laser source polarisation can be found. The method was

Fiber Optic Current Sensors and Optical Current Transformers

The basic principle of Fiber Optic Current Sensors (FOCS) and Optical Current Transformers (OCTs) is to measure polarization rotation due to the Faraday effect. The Faraday

Polarization Error Analysis of an All-Optical Fibre Small Current ...

Finally, an experimental system for the optical fibre small-current sensor is implemented. The experimental results show that the effect of linear birefringence on the fibre current sensing

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Fiber-optic sensor

A fiber-optic sensor is a sensor that uses optical fiber either as the sensing element ("intrinsic sensors"), or as a means of relaying signals from a remote sensor to the electronics that process the signals

Performance study of Full-Fiber optic sensor for simultaneous ...

Stable operation of high-voltage direct current (HVDC) transmission systems relies on accurate monitoring of the strong direct current (DC) electric fields generated. This study presents an

Performance Enhancement of the Polarimetric Fibre Optical Current ...

In this situation, implementation of non-inductive sensors for plasma current measurements is regarded as an attractive option. Currently, the Hall sensors and the Fibre

Optical Fiber Sensors and Sensing Networks: Overview of the Main

Optical fibers provide sensing solutions for many types of applications and environments with high performance. The design of the fiber sensors can take advantage of one or several optical

Electric field sensing and polarisation measurement using advanced ...

The method is all-optical and safe for deployment in any hazardous environment. Also, it enjoys all the advantages of optical fiber-based instrumentation and can be suitably adapted to

A simple fiber optic magnetic field and current sensor with spectral ...

In this paper we present a simple fiber optic sensor for magnetic-field/electric current measurement in a BSO crystal. We make use of a simple polarim

High sensitivity optical fiber current sensor based on polarization ...

A novel high sensitivity optical fiber current sensor (OFCS) based on polarization diversity and a Faraday rotation mirror cavity is proposed and demonstrated. Comparing with single-channel ...

Polarimetric Fiber-Optic Current Sensor With Integrated-Optic ...

The sensor uses a fiber coil operated in reflection mode and an integrated-optic polarization splitter (IOPS) for interrogation. At alternating currents, the sensor performs comparably to high-end

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