

Fiber Bragg gratings solve cross-sensitivity



Overview

Optical fiber sensors based on fiber Bragg gratings (FBGs) are prone to measurement errors if the cross-sensitivity between temperature and strain is not properly considered. This paper describes a self-compensated technique for canceling the undesired influence of temperature in strain. Fiber Bragg grating (FBG) sensors have emerged as advanced tools for monitoring a wide range of physical parameters in various fields, including structural health, aerospace, biochemical, and environmental applications. This review provides a comprehensive overview of FBG sensor technology. proposed by the adoption of different polymers as the coating materials for gratings. By aligning the reflection spectrum edges with the EP condition, significant sensitivity enhancement is achieved under a power interrogation scheme.

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To address cross-sensitivity between temperature and strains, a sensitivity matrix-based approach is implemented, enabling accurate simultaneous detection of multiple perturbations.



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Fiber Bragg gratings (FBGs) are ubiquitous as sensors for a range of parameters and also as optical components in telecommunications systems. However, their temperature dependence ...



Based on the basic principle and theoretical analysis of fiber Bragg grating, this chapter systematically introduces and analyzes the sensing principle, ...



It also has a fair measurement range between 298 K to 453 K with improved sensitivity of 48 pm/ ° C, and the problem of cross-sensitivity was solved by encapsulating the FBG sensor in an ...



Based on the basic principle and theoretical analysis of fiber Bragg grating, this chapter systematically introduces and analyzes the sensing principle, structure design and strain sensing ...



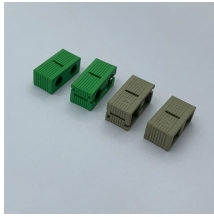
We introduce an eccentric core-to-cladding cross-interface fiber Bragg grating (ECIFBG) and demonstrate its application as a novel multi-purpose sensor for torsion, temperature, and strain ...



cross sensitivity between temperature and strain is one of the most fundamental issues. Zhao et al. reviewed different discrimination measurement methods on the cross-sensitivity effects of ...



Over the years, the development of FBG's technology has progressed significantly. Early research focused primarily on optimizing the grating inscription process, improving sensitivity, and ...



A temperature-compensated microwave photonic filter (MPF) based fiber Bragg grating (FBG) strain interrogation system is proposed and experimentally validated.

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