

光纤技术

编码式光纤光栅传感阵列解调方案的论证

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收稿日期 修回日期 网络版发布日期 2006-8-14 接受日期

摘要 介绍了编码式光栅传感阵列的结构及其传感信号的特点。采用梳状结构对编码式光纤光栅传感阵列进行解调,利用被测光谱通过阵列波导光栅不同通道时输出的不同光强的比值确定被测光的波长。该文分别从理想状态和存在背景反射的状态论证了本文提出的方案的可行性,分析了噪声引起的误差。该系统不但适合于解调大容量的波长信息,而且在解调时不存在任何机械移动部分便可以快速、同时测量多个波长。

关键词 [光纤布拉格光栅](#) [阵列波导光栅](#) [波长解调](#) [梳状结构](#)

分类号

Interrogation Project for Encoding Fiber Bragg Grating Sensor Array

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Abstract The construction of the encoding fiber Bragg grating sensor array and the characteristic of its sensing signal are introduced. A new type of interrogator for encoding fiber Bragg grating sensor array, which has a comb structure and employs the logarithm of the output ratio between the adjacent two channels of arrayed waveguide grating to determine the measured wavelength, is proposed. The paper demonstrates the feasibility of this interrogation project in theory in the cases of background reflectance and the ideal case respectively and analyzes the error caused by the noise. This system is suitable for interrogating a large number of wavelength information, and can carry out a fast and simultaneous interrogation of multiple wavelengths without any mechanically moving parts.

Key words [fiber Bragg grating\(FBG\)](#) [arrayed waveguide grating\(AWG\)](#) [wavelength demodulation](#) [comb structure](#)

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