

## 基于信号重构技术的FBG加速度测量系统研究

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摘要:

采用连续波调频,结合波分复用技术设计了基于小波滤波的光纤光栅加速度测量系统,提出压应力和拉应力同时实施的双光栅加速度测量探头的结构,选用其中心反射波长之差为传感信号,既消除了温度噪声对传感信号的干扰,又提高了测量的灵敏度和分辨率。应用小波信号处理方法,不仅实现了波长绝对编码,而且实现了微加速度信号的重构。所设计的测量系统具有结构简单、扫描频率高、分辨率好、线性度好等优点。

关键词: 小波信号重构; 加速度传感器; 光纤光栅; 分布式测量

## Study on FBG Accelerometer Based on wavelet Reestablish Technology

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**Abstract:**

A vibrating FBG acceleration measuring system with continuous wave modulation frequency and wavelength division multiplex technology is presented in this paper. Double FBG acceleration detector with pressure strain and drag strain applying simultaneity is designed. Selects difference of its central reflection wave length as sensing signal. Both eliminated the temperature noise to the sensing signal disturbance, and enhanced the measuring sensitivity and the resolution. Using wavelet signal processing methods not only completed the optical wavelength absolute code, improve imbalanced and nonlinear optical signal efficiently, but also reestablish micro accelerate signal. This system has some advantages such as simple structure, high scan frequency, high resolution and good linearity.

**Keywords:** Wavelet Signal Reestablish Accelerometer Optic Bragg Grating(FBG) Distributed Measurement

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