

光纤技术

双边缘均值光纤Bragg光栅波长解调技术

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摘要 光纤Bragg光栅(FBG)传感器是一种波长调制型传感器, 波长解调技术是FBG传感系统的关键, 通常是对FBG反射谱进行波形采样, 得到反射谱的峰值信号, 以此作为FBG中心波长的特征值。这种方法需要实时采集大量数据, 所以影响解调速度。通过对FBG反射谱的分析, 得出FBG反射谱具有很好的对称性。在此基础上提出了采用反射波双边缘均值的方法测算中心波长。实验证明, 采用这种方法进行波长解调, 可以使FBG信号处理简单、动、静态波长时测算精度高, 可以极大地提高解调系统处理FBG传感信号的速度。

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FBG wavelength demodulation technology with double edge average

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Abstract The peak value of reflection spectrum can be measured and used as characteristic value for the central wavelength by sampling the reflection spectrum of FBG. With this method, a great deal of data need to be collected and processed, and the demodulation speed of the system is decreased. A simple but effective method is put forward to solve the problem. The analysis on FBG reflection spectrum indicates that the FBG reflection spectrum is very symmetrical. Based on this characteristic, the method to average the double edge of a wavelength is proposed for demodulating the central wavelength of FBG. The experiment proved that the demodulation system using this technique can process the reflection signal of FBG easily and obtain the central wavelength of FBG accurately. With this technique, the speed of demodulation for FBG sensing signal was improved.

Key words [FBG demodulation](#) [fiber optic sensing technology](#) [reflection spectrum](#) [signal processing](#)

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