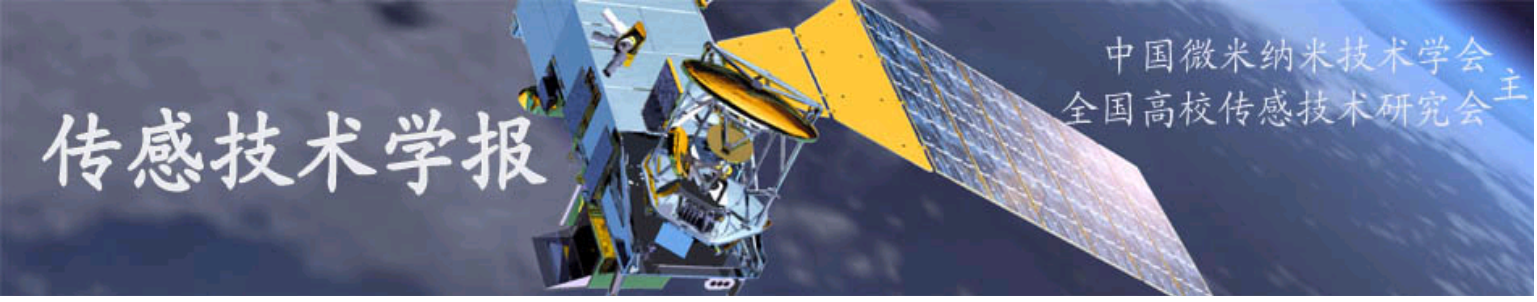

一种强度调制型频率编码光纤环传感器阵列

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摘　要：

提出一种基于强度调制技术的频率编码光纤环传感器。给出光纤传感阵列结构并阐述了多传感器准频分复用原理，分析了阵列中传感器的反射信号特征，并重论了不同长度光纤环的谐振频率特性。结果表明，通过改变光纤耦合系数及选用合适的光纤环长度，可以提高传感系统的复用能力和分辨能力。系统采用频率解调技术以提高信噪比和探测灵敏度。此系统可用于准分布应变和温度的测量。

关键词：光纤环传感器；强度调制；准频分复用；频率跟踪解调

A Frequency Encoding Fiber Ring Sensor Array Based on Intensity Modulation

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Abstract:

A novel frequency encoding fiber ring sensor is proposed and demonstrated based on frequency sweep sinusoidal intensity modulation technique. In this paper the configuration of the fiber optic sensor array and the principle of quasi-frequency division multiplexing are presented. The characteristics of the array backward signals to photo-detector is analyzed and the resonant frequency of fiber ring sensor with different length is mainly discussed. The results show that the resolution ability of the se array can be increased through changing coupling efficiency of couplers and choosing appropriate fiber ring length. Demodulation was achieved by using frequency trac demodulator, it improves system signal to noise rate (SNR) and detection sensitivity. This sensor array can be used to measure the quasi-distributed strain and temperatu

Keywords: fiber ring sensor; intensity modulated; quasi-frequency division multiplexing; frequency tracking demodulator

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