

论文

干涉型光纤传感器的消偏振衰落技术研究

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摘要:

本文对消除干涉型光纤传感器信号偏振衰落的偏振分集接收PDR(Polarization Diversity Receiver)技术进行了理论分析.通过三态PDR方式,对输出的最大有效幅度信号进行选取,能够避免传输光偏振态变化导致干涉信号完全衰落的现象,使干涉信号有效幅度在一定范围内变化.采用基于反正切计算的相位生成载波PGC(Phase Generated Carrier)解调技术的相位测量结果不受由于偏振衰落导致干涉信号有效幅度变化的影响.提出结合三态PDR方式和基于反正切计算的PGC解调技术消除偏振衰落问题的影响,实现干涉型光纤传感器中相位信号的理想解调.

关键词: 干涉型光纤传感器 偏振衰落 偏振分集接收 相位生成载波

Polarization Induced Fading Eliminating Technique for Interferometric Optical Fiber Sensor

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Abstract:

A method of polarization induced fading eliminating with PDR (Polarization Diversity Receiver) is analyzed theoretically. Complete polarization induced fading is avoided through tri-state PDR method. The phase measurement result of PGC(Phase Generated Carrier) demodulating technology based on ARCTAN calculation is immune to amplitude change of interference signal due to polarization induced fading. Combination of tri-state PDR method and PGC demodulating technology based on ARCTAN calculation overcomes the problem of polarization induced fading in interferometric optical fiber sensor and ideal demodulation of phase signal will be implemented.

Keywords: Interferometric optical fiber sensor Polarization induced fading PDR(Polarization Diversity Receiver) PGC(Phase Generated Carrier)

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