

磁光调制法测量高双折射光纤拍长的灵敏度分析

柳树, 石志东, 包欢欢

(上海大学 通信与信息工程学院, 特种光纤与光接入网重点实验室, 上海 200072)

Sensitivity Analysis of Magneto-optic Modulation Method in Measuring Beat Length of Birefringence Optical Fiber

LIU Shu, SHI Zhi-dong, BAO Huan-huan

(School of Communication and Information Engineering, Key Lab of Specialty Fiber Optics and Optical Access Networks, Shanghai University, Shanghai 200072, China)

- [摘要](#)
- [参考文献](#)
- [相关文章](#)

Download: [PDF \(602KB\)](#) [HTML \(0KB\)](#) Export: [BibTeX](#) or [EndNote \(RIS\)](#) [Supporting Info](#)

摘要 基于法拉第磁光效应, 研究在光纤拍长磁光调制法测试系统中, 对于给定的磁隙宽度和磁场强度, 起偏方式与检偏方式对拍长测试灵敏度的影响. 通过理论分析发现, 除了目前通常采用的线偏振光沿光纤双折射主轴注入结合渥拉斯顿棱镜 45° 检偏的测试方式之外, 另有两种测试方式也可以得到最大灵敏度, 一种是线偏振光 45° 注入结合渥拉斯顿棱镜沿轴检偏, 另一种是圆偏振光注入结合渥拉斯顿棱镜沿轴检偏. 最后一种实验方式不需要在入射端精确定位光纤的双折射主轴方向, 能简化实验过程, 避免角度调节引入的测量误差.

关键词: [拍长](#) [磁光调制](#) [起偏方式](#) [检偏方式](#) [灵敏度](#)

Abstract: Based on Faraday effects in birefringence optical fiber, we study the influence of the polarized style and the style of analysis on the measurement sensitivity of beat-length. This is done by using magneto-optic modulation techniques in which the magnetic gap and magnetic intensity are known. In a commonly used style, the input light is linearly polarized and parallel to the birefringence axis of the fiber, and the two analyzing axes of Wollaston prism make 45° with the birefringence axis of the fiber. In addition to this style, two other experimental styles are found to provide high sensitivity. In one of these styles, the input light is linearly polarized having an angle of 45° with respect to the birefringence axis of the fiber, and the Wollaston prism is parallel to the birefringence axis. In the other style, the input light is circularly polarized and the Wollaston prism is parallel to the birefringence axis. The latter does not require accurate birefringence axis direction at the input end. This makes experiments more convenient and can reduce measurement error due to angle adjustment.

Keywords: [beat length](#), [magneto-optic modulation](#), [polarizing style](#), [analyzing style](#), [sensitivity](#)

收稿日期: 2007-07-07; 出版日期: 2008-12-21

通讯作者 石志东

引用本文:

柳树, 石志东, 包欢欢. 磁光调制法测量高双折射光纤拍长的灵敏度分析[J]. 上海大学学报(自然科学版), 2008, V14(6): 585-589

LIU Shu, SHI Zhi-dong, BAO Huan-huan. Sensitivity Analysis of Magneto-optic Modulation Method in Measuring Beat Length of Birefringence Optical Fiber [J]. J. Shanghai University (Natural Science Edition), 2008, V14(6): 585-589

链接本文:

<http://www.journal.shu.edu.cn//CN/> 或 <http://www.journal.shu.edu.cn//CN/Y2008/V14/I6/585>

没有本文参考文献

[1] 孙博华, 韩立锋. 压电薄膜微机电加速度传感器的力学分析[J]. 上海大学学报(自然科学版), 2009, 15(6): 621-627

Service

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [Email Alert](#)
- ▶ [RSS](#)

作者相关文章

- ▶ [柳树](#)
- ▶ [石志东](#)
- ▶ [包欢欢](#)

