首 页 | 顾问委员 | 特约海外编委 | 特约科学院编委 | 主编 | 编辑委员会委员 | 编 辑 部 | 期刊浏览 | 留 言 板 | 联系我们

SPR传感芯片的理论与实验研究

作　者：郝鹏1,2，吴一辉1*，庄须叶1,2

单　位：（1 中国科学院 长春光学精密机械与物理研究所 应用光学国家重点实验室，吉林 长春 130033； 2 中国科学院 研究生院，北京100039）

基金项目：

摘　要：

针对光纤SPR（表面等离子体共振）传感器制作工艺复杂的问题，提出了一种光纤先固定后部分镀膜的SPR传感芯片的制作方法。依据电磁场和射线理论，分析并讨论了此种波长调制部分镀膜SPR传感芯片的工作原理，采用MEMS制作工艺对探测光纤进行封装固定以后，再对光纤进行部分镀膜，其结构简单，工艺性好，易于实现批量化。最后，搭建了一套基于波长检测的光纤SPR测试系统对其进行测试。实验结果表明：在折射率范围为1.33～1.36 时，共振波长同折射率具有良好的线性关系，光谱仪分辨率为0.1nm时，其分辨率可达到3×10^{-5}折射率单位。

关键词：表面等离子体共振；光纤传感器；折射率；共振波长

Theoretical and experimental research on SPR sensor chip

Author's Name: HAO Peng1,2, WU Yi hui1*, ZHUANG Xuye1,2

Institution: (1 National Key Lab of Applied Optics, Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences, Changchun 130033; 2 Graduate School of the Chinese Academy of Sciences, Beijing 100039)

Abstract:

In view of the SPR (surface plasmon resonance) optical fiber sensor manufacture craft complex question, a method of fixed first and fiber optic partly coating after was proposed. Based on the electromagnetic field and radial theory, analyzed and discussed the working principle of this wavelength modulation partly coating SPR sensor chip. Optical fiber was carried on the seal fixedly by MEMS technology, then, it was partly coated by gold film. It had simple structure feature, technology capability good, and easy batching. Finally, build a test system based on the wavelength modulation to carry on the test examination. The experimental result indicated that, When the refractive index was 1.33 ~ 1.36, the linear relations between the resonance wave-length and the refractive index linearity was very well, when the spectroscope resolution was 0.1nm, its resolution may achieve 3×10^{-5} refractive index unit.

Keywords: Surface plasmon resonance; Optic fiber sensor; Refractive index; Resonance wave-length

投稿时间：**2010-03-31**

查看pdf文件