

论文

新型压力测试传感器的研制及应用分析

廖波, 周国庆, 毋磊, 赵光思

中国矿业大学 深部岩土力学与地下工程国家重点实验室 力学与建筑工程学院, 江苏 徐州 221008

摘要:

以填充型导电聚合物复合材料为基础设计了新型压力测试传感元件, 重点分析了新型压力传感器的优点及价值。对传感元件的压阻机理进行了介绍, 并与普通型振弦式压力盒进行了对比, 新型压力传感器结构具有制作多点压力分布测试传感器的明显优势和特点。通过室内压力试验及对某选煤厂筒仓基坑工程加筋土垫层中的压力实测, 初步验证了新型压力传感器的可行性和可靠性。总体表明, 基于导电复合材料的新型压力传感器具有结构简单、使用灵活性强等优点, 为岩土领域压力测试特别是压力分布测试提供了新的方法。

关键词: 压力传感器; 导电复合材料; 压敏性

The development and application analysis of the new pressure sensor

Abstract:

A new pressure sensor based on filled conductive polymer composites was developed whose advantages and value were analyzed. The mechanism of pressure sensitive property was introduced and the new type of pressure sensor structure can more easily be developed to test more compression point compared with the regular vibration string type pressure box. The compression test and the measure of earth pressure of the reinforced cushion in a coal mine silo foundation showed that the new pressure sensor was feasible and reliable. Results show that the new developed pressure sensor based on conductive composites is flexible and its simple structure provides a new approach for the pressure test, especially for the pressure distribution test in the geotechnical field.

Keywords: pressure sensor; conductive composites; pressure sensitivity

收稿日期 2011-08-15 修回日期 2011-10-03 网络版发布日期 2012-10-08

DOI:

基金项目:

国家自然科学基金资助项目 (50974117)

通讯作者: 廖波

作者简介: 廖波(1985—), 男, 江苏睢宁人, 博士研究生

作者Email: liaobo2003@cumt.edu.cn

参考文献:

本刊中的类似文章

扩展功能

本文信息

- ▶ Supporting info
- ▶ PDF(1470KB)
- ▶ [HTML全文]
- ▶ 参考文献PDF
- ▶ 参考文献

服务与反馈

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ 引用本文
- ▶ Email Alert
- ▶ 文章反馈
- ▶ 浏览反馈信息

本文关键词相关文章

- ▶ 压力传感器; 导电复合材料; 压敏性

本文作者相关文章

- ▶ 廖波
- ▶ 周国庆
- ▶ 毋磊
- ▶ 赵光思

PubMed

- ▶ Article by Liao,b
- ▶ Article by Zhou,G.Q
- ▶ Article by Wu,l
- ▶ Article by Diao,G.S