

基于MEMS微触觉测头和纳米测量机的特征尺寸测量*

作者: 李源^{1,2}, 邹子英¹, 傅云霞¹, 傅星², 栗大超², 胡小唐²

单位: 1. 上海市计量测试技术研究院, 上海, 201203 2. 天津大学精密测试技术及仪器国家重点实验室, 天津, 300072

基金项目:

摘要:

针对微小结构几何量测量的需求, 通过集成MEMS微触觉测头和纳米测量机构建了高精度的测量系统。在验证测头性能的基础上, 完成了一系列判断测头测量力和精度的实验, 在轴向、同向横向、异向横向三个方向测量的标准偏差分别为41.7552nm, 6.05 μ m, 6.16 μ m, 同时, 在扫描实验中进程回程扫描差值的标准偏差为23.088nm。

关键词: 微机电系统, 微触觉测头, 尺寸测量, 纳米测量机

Dimension measurement based on MEMS micro tactile probe and nanomeasuring machine

Author's Name: LI Yuan^{1,2}, Zou Ziying¹, Fu Yunxia¹, Fu Xing², Li Dachao², Hu Xiaotang²

Institution: (1 Shanghai Institute of Measurement and Testing Technology, Shanghai 201203, China) (2 State Key laboratory of Precision Measuring Technology & Instruments, Tianjin University, Tianjin 300072, China)

Abstract:

According to dimension measurement requirement of micro structure, a measurement system combined by MEMS micro tactile probe and nanomeasuring machine is constructed. On basis of performance verification of probe's output, a series of tests are done. The standard deviations of measurement in same vertical, same transverse direction, and opposite transverse direction are 41.7552nm, 6.05 μ m, 6.16 μ m separately. The standard deviation of difference between trace and retrace in scanning test is 23.088nm.

Keywords: MEMS, Micro tactile probe, Dimension measurement, Nanomeasuring machine

投稿时间: 2010-04-27