基于**WLAN**的陀螺综合虚拟测试系统设计和实现

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摘　要：

针对陀螺测试和工程应用需求，设计和实现了陀螺综合测试系统。规划了设计方案：系统采用标准转台提供角速度信号，光纤陀螺作检测标准，待测陀螺为微机械陀螺；对标度因数、非线性度、最大角速度、零偏等部分常用技术参数的测试及计算方法做了分析，用辨识法对陀螺的系统模型进行了建模；采用虚拟仪器技术实现了对两路陀螺的同时数据采集、处理，数据和波形显示及数据存储等测试功能；采用了巴特沃斯低通滤波器和滑动平均滤波器相结合对采集的陀螺信号进行滤波；还实现了对实验现场的图像采集，在无线局域网（WLAN）内实现了数据共享和打印等实验功能。经实验验证，被测陀螺的技术参数检测数据能够反映实际效果，系统达到了设计要求。

关键词：陀螺; 测试实验; 虚拟仪器; WLAN; 模型辨识

Design and Implementation of Integrative Virtual Testing System of Gyro Based on WLAN

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Abstract:

An integrative testing system of gyro was designed and implemented for gyro testing and engineering application. A design plan was developed. The system uses standard rotary table as standard rate provider, FOG as test criteria and MEMS gyro as the tested gyro. Testing and computing methods of main technical parameters such as scale factor, nonlinearity, maximum input angular rate, bias, etc were analyzed and system modeling of gyro was carried out by identification method. Virtual instrument techniques were applied to testing functions such as data acquisition & processing of two gyros, display & storage of data and waveform, etc. Butterworth low-pass filter combined with moving-average filter was designed to smooth the output of two gyros. Experimental functions such as image acquisition of experiment site, data sharing & printing based on WLAN were also implemented. The experiment result shows that the testing data can represent the actual states of tested gyro's main technical parameters and the system meets the design requirements.

Keywords: gyro; testing experiment; virtual instrument; WLAN; model identification

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