

论文

一种完整测量膜片法拉第效应和损耗的方法

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摘要:

提出了一种能完整测量零锁区激光陀螺法拉第偏频组件中旋光膜片的法拉第旋光效应和超低损耗的方法和自动测量系统.该方法利用双光路正交分解平衡测量原理,通过测量两束光光强平衡时起偏器的偏振方向来确定旋光膜片的法拉第转角和超低损耗.测量结果表明:系统对法拉第转角的测量分辨率小于0.9",损耗测量分辨率为10 ppm.环境温度的波动对法拉第转角的测量变化很小,但对膜片超低损耗测量影响很大,温度变化8.1 K,膜片损耗测量值变化一个周期.实验及结果证明,该系统能满足超高精度测量的要求.

关键词:

A Method for Measuring Completely the Faraday Effects and Losses in Optical Mirror Coated

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Abstract:

A method and an auto-test system with the experimental configuration are proposed to measure both the Faraday effects and ultra low losses of optical mirror coated used in zero-lock laser gyro faraday bias element.The method based on the principle of dual beam path orthogonal decomposition balance measurement,both the faraday rotation angle and ultra low losses can be obtained through determining the polarization direction of the polarizer when light intensity of the two beam equal.The experiment results show that the angular measurement resolution is better than 0.9",and the ultra low losses measurement resolution is 10 ppm.The Faraday rotation angle has a low sensitive to the temperature response,but the temperature change has a great effect on the measurement of ultra low losses.When the temperature changes 8.1 K,the ultra low losses change in a cycle.Experiment and its results prove this auto-test system can realize high precision measurement.

Keywords: Optical measurement Zero-lock laser gyro Faraday bias element Optical mirror coated Faraday effect Ultra low optical coating losses

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