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论文

共路外差法分析牛顿望远镜偏振特性

张绪国;江月松;黎芳

北京航空航天大学电子信息工程学院, 北京 100083

摘要：

应用共路外差干涉法分析了牛顿望远镜的偏振特性。根据菲涅耳定律求出了入射光s-偏光和p-偏光入射到望远镜各点的反射率公式。给出了共路外差干涉法测量牛顿望远镜偏振特性的实验装置原理图。采用632.8nm的外差光源，分析了牛顿望远镜对s-偏光和p-偏光反射系数、相位差以及对入射光偏振度的影响，根据入射角度的不同绘制了相应的变化曲线。结果表明：镀有铝膜的牛顿望远镜对入射光偏振特性影响较小，s-偏光和p-偏光反射系数相差不到0.01，偏振度变化不超过0.07，适用于激光遥感偏振成像的接收系统。

关键词： 光学测量 共路外差 反射系数 相位差 偏振度

Analysis of polarization characteristic of Newton telescope with common-path heterodyne method

ZHANG Xu-guo;JIANG Yue-song;LI Fang

School of Electronics and Information Engineering, Beijing University of Aeronautics and Astronautics, Beijing 100083, China

Abstract:

The polarization characteristic of Newton telescope is analyzed with the common-path heterodyne interferometry. The reflectance formulas of both s-polarized light and p-polarized light incident on each point of the telescope were derived based on the Fresnel law. The schematic diagram of the experimental setup for measuring phase difference and analyzing the polarization characteristics of Newton telescope with the common-path heterodyne interferometry is given. The influences of Newton telescope on s-polarized light and p-polarized light reflectance, phase difference and incident light polarization degree are analyzed with 632.8nm heterodyne laser source. The curves corresponding to reflectance, phase difference and polarization degree at different incident angles were drawn. The results show that the Newton telescope coated with aluminum produces little influence on the polarization characteristic of incident light, the reflectance difference between s-polarized and p-polarized lights is less than 0.01, and the variation range of the polarization degree is less than 0.07. Therefore, it is suitable for the receiving subsystem of the laser remote polarization imaging system.

Keywords: optical measurement common-path heterodyne reflection coefficient phase difference polarization degree

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作者简介:

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