应用光学 2010, 31(1) 91-94 DOI: ISSN: 1002-2082 CN: 61-1171/O4

光学计量与测试

一种舰船光电装备光轴检测仪

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摘要：

为了在实验外场和装舰现场克服舰船光电装备多传感器光轴一致性标校中由于环境限制、舰船摇晃等造成的操作困难，提出一种舰船光轴检测仪方案。通过共光路和光谱转换技术实现激光光轴与可见光轴的耦合，激光像斑在可见光通道输出成像视频，依据像斑中心与装备十字刻线位置关系判断激光与可见光光轴的一致性。应用CAD/CAE技术对光轴检测仪的关键器件——光轴耦合单元进行仿真分析，得到-10℃～+40℃温度范围内的反射镜面平行性误差分别为13.576332″和16.397421″；整机环境实验结果表明，光轴检测仪本身精度误差小于20″，满足光电装备光轴的一致性要求。

关键词： 舰船光学 光电装备 光轴检测仪

Optical axis detection instrument for shipborne photoelectrical devices

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Abstract:

A design scheme of the optical axis detection instrument for shipborne optoelectronic devices is proposed to overcome the difficulties resulted from environmental limitation and ship stagger during the process of photoelectrical multi-sensors boresight parallelism adjustment in the outer testing locate and loading ship. The coupling of laser and visible-light boresights is realized with common-path and spectrum conversion technologies. The instrument's key part-boresight coupling unit is simulated and analyzed by CAD/CAE. The parallelism errors of 13.576332″ and 16.397421″ between two reflectors were obtained in the range of -10℃～+40℃. The result of environmental test indicates that the accuracy error of the instrument is less than 20″ and meets the design index.

Keywords: warship optics photoelectric device optical axis detection instrument

收稿日期 修回日期 网络版发布日期

DOI:

基金项目:

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