

论文

关于激光测距机光轴平行性校正方法的改进

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摘要:

对激光测距机传统的光轴校正方法进行了改进:通过光轴平行性偏差与偏心环(框)旋转角度之间的校正模型计算出偏心环(框)需要调整的角度值,利用光轴校正装置可实现激光测距机光轴的校正。校正方法可分为半自动校正和全自动校正两种方法:半自动校正方法采用在激光测距机双偏心结构上加刻度环,通过套筒旋转双偏心结构一定角度,实现对光轴进行调整;全自动校正方法采用步进电机带动双偏心结构旋转达到对光轴进行调整的目的。通过对某型激光测距机进行实验研究,实验结果表明,采用提出的方法进行光轴校正后光轴误差均在最大允许误差范围内(0.25mrad),该值满足实际要求。

关键词: 激光测距机;光轴平行性;光轴校正方法

Improvement of optical axis parallelism correction for laser rangefinder

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Abstract:

The method of the traditional optical axis correction for laser-range-finder was improved. The angle which the eccentric ring (or eccentric frame) needs to adjust was calculated by the mathematical model of the optical axis parallel deviation and the eccentric ring (or eccentric frame) rotary angle. The correction of optic-axes parallel was realized by the optical axis correcting device. Two correcting methods (semiautomatic and fully automatic corrections) are presented. In the semiautomatic correcting method, a scale ring is attached to the lateral portion of the double eccentric structure, and the optical axis correction is realized by rotating the eccentric structure to a certain angle by the two eccentric sleeves. In the fully automatic correcting method, the double eccentric structures are controlled by two stepping motors to adjust the optical axes. The experimental research on a certain laser rangefinder is conducted. The results show that the optical axis error corrected by the method is within the maximal permitted range (0.25mrad), the efficiency is increased by the improved method, and this method can meet the requirement of the practical need.

Keywords: laser rangefinder; optic-axes parallelism; method of optic-axes correction

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