

光学元件与制造

五角棱镜补偿法加工工艺研究

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摘要:

由于五角棱镜两B棱的投影夹角对第二光学平行差影响倍率较大且加工过程中无法测量该夹角,从而导致棱镜加工合格率较低。通过分析侧面垂直度误差及Δ45°对五角棱镜光学平行差的影响,提出一种新的五角棱镜加工工艺方法:利用最后一个加工面对前3个已加工面存在的角度误差进行一次性补偿,从而降低了对各加工面的加工误差要求。实践证明:该方法能够有效地提高五角棱镜加工的合格率和生产效率,减小加工难度,并能显著降低对加工和检测设备的精度要求。

关键词: 五角棱镜 光学平行差 误差补偿

Error compensation for pentagonal prism

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Abstract:

The projection angle of two B-edges of pentagonal prism has a great effect on the second optical parallelism; however, it cannot be measured during on line processing, which results in low qualification rate. By analyzing the impact of perpendicular error of the side face and angle error of 45° on the optical parallelism of pentagonal prism, this paper provides a new process for producing pentagonal prism, which modified the angle error of the last face to compensate the angle errors of three processed faces so as to release the strict requirements for process error of these surfaces. By using this process, qualification rate and productivity was raised, the complexity of the process was reduced, and the strict requirements for the machine and measurement equipments were released.

Keywords: pentagonal prism optical parallelism error error compensation

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参考文献:

[1] 光学零件工艺手册编写组. 光学零件工艺手册(上) [M]. 北京: 国防工业出版社, 1977. Editing Group of Optical Element Processing Handbook. Optical element processing handbook [M]. Beijing: National Defense Industry Press, 1977. (in Chinese) [2] 王松伟, 蒋军彪, 姚合宝, 等. 高精度角度加工技术 [J]. 应用光学, 2008, 29(6): 1013-1016. WANG Song-wei, JIANG Jun-biao, YAO He-bao, et al. High precision angle processing [J]. Journal of

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Applied Optics, 2008,29(6):1013-1016. (in Chinese with an English abstract)

[3] 常山, 曹益平, 陈永权. 五角棱镜的光束转向误差对波前测量的影响 [J]. 应用光学, 2006,27(3):186-191.

CHANG Shan, CAO Yi-ping, CHEN Yong-quan. Influence of beam turning error of pentagonal prism on wave-front measurement [J]. Journal of Applied Optics, 2006,27(3):186-191. (in Chinese with an English abstract)

[4] 闫亚东,何俊华,仓玉萍,等.用ZEMAX模拟五棱镜误差对平行度检测的影响 [J]. 应用光学, 2007,28(5):649-653.

YAN Ya-dong, HE Jun-hua, CANG Yu-ping, et al. Effect of penta prism error on parallelism detection [J]. Journal of Applied Optics, 2007,28(5):649-653. (in Chinese with an English abstract)

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2. 常山;曹益平;陈永权 .

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