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光电工程

数字化刀口仪定量检验技术的研究

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摘要 在传统刀口仪的基础上，提出了一种对刀口仪进行数字化改进的方案，实现定量检验的目的。在计算机控制下，刀口以一定的步长沿垂直于光轴的X Y平面切割像点，CCD实时采集刀口切割像点形成的阴影图像。从几何光学的原理出发，分别对沿X轴和Y轴切割像点形成的系列阴影图像进行了分析处理，得到了被测光学零件表面的斜率信息，计算出零件波像差的均方根值和峰谷值，实现了对光学零件表面面形的定量检测。介绍了系统的组成、原理及测试过程。

关键词 刀口检验 图像处理 波像差

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tudy of quantitative evaluation technology by using digitization Foucault tester

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Abstract Based on the traditional Foucault tester, a quantitative evaluation method that improves the tester by digitized technology is proposed. Under the control of PC,knife edge cuts the image point along X Y plane by a fixed step size. A series of shadow patterns are captured through CCD in real time. Proceeding from the theory of geometric optics,the shadow patterns captured from X axis slices and Y axis slices are analyzed and processed, the slope information of optical element surface is obtained, and the RMS and P V values of wavefront aberration for the optical element under test are calculated. In this way,the quantitative evaluation to the optical element surface is performed. The system configuration, principle and measurement process are described in the paper.

Key words Foucault test image processing wavefront aberration

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