

光学计量与测试

准直物镜在变焦距镜头杂散光系数测试中的作用和影响分析

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摘要:

在对变焦距光学镜头进行杂散光系数测试的过程中, 需要了解各测试环节的作用及对测量结果的影响。讨论了准直物镜使用与否对杂散光系数测量结果的影响。通过对杂散光形成机理的分析, 将杂散光来源分为视场内与视场外两种, 阐述不同来源杂散光的不同特点及这两种杂散光通过准直物镜后的状态。用两个参数不同的变焦距光学镜头在有和无准直物镜两种情况下杂散光系数的测量结果, 说明准直物镜在杂光测试中的作用。对于视场外入射光束形成的杂散光, 准直物镜的使用与否对其测量结果影响巨大, 而对视场内入射光束形成的杂散光影响很小, 测量时可以利用准直物镜来判断光学镜头杂散光的来源。同时通过实验说明入射光线在准直物镜间的多次反射形成的杂散光约为1%, 它可作为系统误差从测量结果中剔除。

关键词: 黑斑法 杂光测量 准直物镜 测量精度

Using collimator in testing zoom lens stray light

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Abstract:

For testing zoom lens stray light, it is necessary to understand the role of every test component and their impact on the measurement results. In the stray light measurement device, collimator is selected according to lens parameter. This paper discusses the collimator's effect on stray light measurements. By analyzing the formation mechanism of stray light, stray light is divided into two types, in field and out field. Different stray light characteristics are explained and the states of these two types of stray light after passing through the collimator are given. Two zoom lenses of different parameters are measured with a collimator or without a collimator and their results are compared. For stray light formed outside the field of view, use of collimator is significant and important, however, for stray light formed by the incident light beam inside field of view, collimator has no significant impact on measurement result. Collimator can be used to judge the source of stray light. The stray light formed by multiple reflections of incident light between collimating objectives are about 1%, which can be eliminated as a systematic error.

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