

论文

R-C系统外遮光罩挡光环的程序化设计及锥状内遮光罩的改进

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摘要:

基于几何作图法推导出R-C系统外遮光罩内挡光环顶点的坐标公式, 利用C语言编程实现程序化设计挡光环。在中心遮光比确定的情况下, 推导出内遮光罩的顶点坐标公式, 并将通常使用的主镜一级锥状遮光罩改进为二级锥状遮光罩, 以高速摄影系统的R-C型折反式主物镜为例, 对其主镜和次镜内遮光罩进行设计, 并给出设计结果。当轴角为70°, 遮光罩为二级和一级时, 到达像面的杂散光照度分别为1.0823×10⁻¹²W/m²和1.6614×10⁻¹⁰W/m², 相差二个数量级, 证明改进的二级遮光罩优于一级遮光罩, 能有效抑制杂散光。最后, 设计了主、次镜间镜筒内壁上等高挡光环, 进一步抑制了R-C系统的杂散光。

关键词: R-C系统; 杂 R-C系统; 杂散光; 遮光罩; 挡光环

Program design of outer baffle vanes and improvement of conical inner baffle in R-C system

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Abstract:

The vertex coordinate formulas for outer baffle vanes of R-C system are deduced based on geometrography, and the vanes are designed with C language program. The vertex coordinate formulas of inner baffle are also deduced after assuring the central obscuration ratio, and then the common one-grade conical baffle is improved into the two-grade one. The correctness of baffle design is proved by an example and its simulated analysis, meanwhile an effective way of suppressing the stray light is provided. Finally, the same-height vanes in drawtube between primary and secondary mirrors are designed for further suppressing the stray light in R-C system.

Keywords: R-C system; stray light; baffle; vane

收稿日期 修回日期 网络版发布日期

DOI:

基金项目:

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