

**摘要：**提出了一种一体式双反射结构以解决导引头前视红外系统中R-C双反射系统装调困难以及在导弹飞行过程中次镜支架的稳定性问题。该结构将主次镜集成在一个透镜前后表面,通过对透镜前后表面进行加工并涂敷内反射膜来实现双反射镜一体化。如此配置使系统装调只需针对整个透镜,从而降低了装调难度,提高了结构的稳定性。设计了适用于中波红外的紧凑型二次成像光学系统,该系统像质优良,各视场光学传递函数均大于0.6,接近衍射极限,并可利用二元衍射光学元件在-40~60℃实现光学被动消热差。最后进行了公差分析,并针对该光学系统列举了一些抑制杂散辐射的方法,实验显示系统满足实际加工和应用需求。

**关键词：**R-C系统 红外折反系统 二次成像 衍射光学元件

## Design of compact integral structure of two-mirror system

YU Lin-yao, Wei Qun, Zhang Xin, Zhang Tianyi, JIA Hong-Guang

Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences

**Abstract:** A compact integer structure with two mirrors was presented to solve the problems that the R-C reflect IR system is difficult to be installed into a seeker and the second mirror support is not stable in missile flight. The primary and secondary mirrors were integrated the both surfaces of a lens. Then, the front and rear surfaces of lens were machined and the inner reflect films were coated on two surfaces. The two mirrors were assembled in one lens to allow the installation of the two mirrors to be easier and the structure of the second mirror to be more stable. A compact relay imaging optical system for middle infrared was designed. It has good imaging capability and its Modulation Transfer Function(MTF) for all field of view is more than 0.6(very close to the diffraction limitation). The optics system can implement the athermal between -40~60℃ by a Diffractive Optical Element(DOE). Finally, a Ment Karol simulation was performed to analyze the tolerance and some ways to resist the stray light of this system was given. The design satisfies the need of machining and application.

**Keywords:** R-C systems infrared catadioptric system relay imaging diffractive optical element (DOE)

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通讯作者: 虞林瑶

作者简介: 虞林瑶(1987-), 男, 江苏镇江人, 研究实习员, 2011年于哈尔滨工业大学获得硕士学位, 主要从事红外光学系统设计。

作者Email: yulinyao87@163.com

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