

面向微小卫星的红外静态焦平面地球传感器设计

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摘要：

红外地球传感器是卫星姿态控制系统中的一个重要部件，基于光机扫描技术的传统红外地球传感器存在体积大、功耗高、精度低的缺点，无法满足微小卫星对姿态传感器的要求。针对以上不足，本文提出了一种基于红外焦平面技术的地球传感器和相应的地面标定测试方法。该设计的地球传感器具有结构简单、体积小、功耗低的特点。本文从地球传感器的工作原理出发，提出了整个传感器构架，系统的软硬件设计。在标定测试方法中，我们建立了该传感器测试模型，并搭建实验测试平台对传感器其精度进行标定。测试结果表明此地球传感器具有 0.1° 的测量精度，能很好地满足微小卫星姿态系统的精度要求。

关键词：地球传感器；微小卫星；红外焦平面；标定

Design of Infrared Static Focal Plane Earth Sensor For Micro-Satellite

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Abstract:

Infrared earth sensor is an important component of satellite attitude control system. Traditional infrared earth sensor based on swing scanning technique has a lot of disadvantages such as: bulky, high power consumption and low precision, unable to meet the requirement of Micro-satellites. In order to overcome these shortcomings, this paper presents a new design of earth sensor based on infrared focal plane and a ground testing measurement. This earth sensor has the following features: small size, simple structure and low power consumption. According to the mechanism of the earth sensor, this paper presents the entire architecture of earth sensor, including hardware and software design. Both the model and calibration of the sensor are given based on the experiment platform. The results of testing indicate that the earth sensor has a precision of 0.1° , meeting the requirement of attitude determination system of Micro-satellite.

Keywords: earth sensor; Micro-satellite; infrared focal plane; calibration

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