

10th International Conference and Exhibition on

LASERS, OPTICS & PHOTONICS

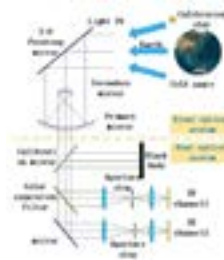
November 26-28, 2018 | Los Angeles, USA

A study of the camera on orbit radial calibration based on blackbody and infrared calibration stars

Zhuoyue Hu

ShangHai Institute of Technical Physics of CAS, China

In view of the radiometric calibration of large aperture optical systems, a parallel light coupling method is proposed to achieve non-uniformity correction and radiometric calibration through the internal blackbody into the optical path. The sensor consists of two parts, the front optical system and the rear optical system. Between the front optical system and the rear optical system is connected by parallel light, which is the characteristic of this calibration system. Its calibration system includes image space blackbody and calibration mirror. In this paper, the relative radiation calibration is realized by an internal blackbody. We establish a response database with integral time and blackbody energy as a variable and a nonlinear non-uniformity correction algorithm based on variable integration time and variable energy are adopted to achieve the relative radiometric calibration of the image. Through the non-uniformity correction algorithm, we get the result which is better than 0.2%. It shows a better result than the two-point correction and multi-point correction. We also use the star and internal blackbody to monitor the stability of the camera, we chose the star which satisfies the Radiation theory, it is easy to find the star and simplify the process. By comparing with the internal blackbody calibration, the calibration method based on the WISE star table can achieve the calibration accuracy better than 10%. We found that the system stability result of the back optical is within 3% and the front optical is within 5% for 8 months. According to the requirement of calibration precision, the frequency of calibration is designed.



Biography

Zhuoyue Hu has completed her undergraduate study in the year 2016 from UESTC(University of Electronic Science and Technology of China). She is studying in the SITP(Shanghai Institute of Technical Physics of the Chinese Academy of Sciences) for a PhD.

niuniugroup@vip.163.com

Notes: