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Author: Dr. Xiaoxiang Zhang
China, csss@pmo.ac.cn

REAL-TIME DETERMINATION METHOD FOR TELESCOPE POINTING ERROR

Abstract

As the telescope manufacture, installation and adjustment, there are some errors in the telescope pointing. In order to make the telescope point to a predetermined observation sky with higher pointing accuracy, it must establish the errors correction model to modify the telescope pointing error. However, because some of the telescope's optical structure is complex ,such as using primary, secondary mirror and the third mirror structure; It has longer focal length and smaller the optical field of view; and there exists CCD image plane rotation error and zero error of code. If the telescope pointing error is larger, it is very difficult for observers to complete theoretical and measured star map matched work, to build the telescope pointing error correction model. In this paper, feature library generation and matching methods of star map are given, which can realize the real-time generation of theoretical and measured star map, and complete two kinds of star map real-time matching. And the method is validated by using the measured frame transfer image (image size 1K 1K). The validation results showed that: In the case of telescope pointing error of less than 3 degrees, the method can achieve real-time determination of the telescope pointing error, and theory star and measured map matching success rate is very high.

Keywords: pointing error, star feature library, real-time match, matching success rate