Park[1], Ho Lee[2], Hyunjong Kim[2], Soojong Pak[1]
[1]School of Space Research, Kyung Hee Univsersity, [2]Gyeonggi Science High School for the Gifted

Gyeonggi science high school for the gifted (GSHS) installed 60cm telescope, which is waiting for student observers. It is essential to understand the characteristics of the photometric system, consisting of telescope, filter, and CCD, to get reliable data. CCD images of SA98 Landolt standard field and M67 were obtained on 19th March 2020. The images of each field were combined by filters, i.e., we ignored the monochromatic atmospheric extinction since the photometric objects themselves are standard stars. 24 standard stars in SA98 field and 12 standard stars in M67 were used to derive the tentative transformation equation between our bv photometric system and Johnson BV photometric system. In this poster, we present the preliminary standardization result for Johnson BV photometric system in GSHS 60cm telescope. The reproductivity is discussed by comparing color coefficients of two fields. We plan to extend this process to Johnsons-Cousins BVRI photometric system and narrow-band filters for flux calibration.

[포 AT-05] Development of adaptive optics system for SNUO 1m telescope

Hyungjoon Ryu, Yong-Sun Park, Jin-guk, Seo
Astronomy Program, Dept of Physics and Astronomy, Seoul National University

Adaptive Optics (AO) is the technology for ground-based telescopes to overcome the interference caused by atmospheric turbulence. We are developing an AO system for the 1-m telescope at Seoul National University Observatory (SNUO). The seeing size of the SNUO is 2 arcseconds on average, and 0.85 arcseconds at best condition. Our system is based on MEMS deformable mirror and Shack-Hartmann wavefront sensor. We developed the wavefront sensor using a cheap CMOS camera, and measured phase disturbance at SNUO. To verify the performance of the AO system, we designed an artificial phase disturber that produces similar scale phase error, measured at SNUO. We carried out laboratory tests in which the AO system measures and corrects the wavefront using the phase disturber and an F/6 light source, the same as that of SNUO telescope. The control system was developed in C++. The system performs closed-loop PI correction up to 100 Hz at a consumer-grade PC.

[포 AT-06] Surface Error Generation of Freeform Mirror Based on Zernike Polynomial for Optical Performance Prediction

Sunwoo Lee[1], Woojin Park[1], Jimin Han[1], Hojae Ahn[1], Yunjong Kim[2], Dae-Hee Lee[2], Geon Hee Kim[3], Soojong Pak[1]
[1]School of Space Research and Institute of Natural Science, Kyung Hee University, [2]Korea Astronomy and Space Science Institute, [3]Korea Basic Science Institute

Not only the magnitude of the mirror surface error, the pattern matters as it produces certain aberrations. In particular, the surface error of the freeform mirrors, which are optimized to eliminate specific aberrations, might show much higher sensitivity in optical performance. Therefore, we analyze the mirror surface error with Zernike polynomials with the goal of generating a realistic error surface. We investigate the surface error of the freeform mirror fabricated by diamond turning machine to analyze the realistic tendency of the error. The surface error with 0.22 μm root-mean-square value is fitted to the Zernike terms using the incremental fitting method, which increases the number of the fitting coefficients through steps. Furthermore, optical performance via surface error pattern based on Zernike terms is studied to see the influences of each term. With this study, realistic error surface generation may allow higher accuracy not only for the feasibility test but also for all tests and predictions using optical simulations.

[포 AT-07] Design of the Filter Exchange Mechanism for Schmidt Telescope

Tae-Geun Ji[1], Woojin Park[1], Jimin Han[1], Dohoon Kim[3], Gu Lim[2], Mankeun Jeong[2], Myungshin Im[2], Soojong Pak[1]
[1]School of Space Research, Kyung Hee University, [2]Astronomy Program, Department of Physics & Astronomy, Seoul National University, [3]Department of Astronomy & Space Science, Kyung Hee University

A prime focus telescope, e.g., Schmidt telescope, has advantages especially for a wide field of view survey in astronomy. In this optical configuration, the camera is placed in front of the primary mirror. Since the installation of a typical filter wheel to the prime focus telescope causes serious obscuration of the incoming light, a customized filter device is required for high sensitivity images. In this poster, we present a new filter exchange mechanism, which can host four filters moving along quadrant directions. We plan to install this on the Celestron 36 cm Rowe-Ackermann Schmidt