

Astrograph (RASA 36) located at El Sause Observatory in Chile.

### [포 AT-08] Design and Analysis of Collimator in Spectrophotometer for Transmission Spectroscopy of Exoplanets

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외계행성 대기 연구를 위한 투과스펙트럼 관측에 적합한 측분광기를 개발하고 있다. 이 측분광기의 광학적 특성은 380~685nm의 파장범위, FOV 10', R>~400이며, 슬릿부, collimator, VPH grism, imaging lens와 CCD로 구성되어 있는데, 보현산천문대 1.8m 망원경의 CIM (Cassegrain Interface Module)에 카트리지 방식으로 장착되어 사용한다.

그 중 doublet 렌즈 2개를 대칭으로 배치하여 초점거리 280mm가 되도록 만든 collimator는 슬릿을 통과한 f/8 입사광에서 지름 35 mm의 pupil을 만드는데, 이곳에 VPH grism을 설치하였다. collimator 렌즈는 axial spring과 radial spring으로 알루미늄 barrel에 고정하였다. 이 collimator barrel은 CIM에 쉽게 장탈착 할 수 있도록 모듈화 하였다. Collimator Barrel에 대한 구조 해석 결과, 망원경 이동에 따른 중력에 의한 변형은 충분히 작았다. Grism은 슬라이딩 형태로 장착되어 영상 확인도 가능하도록 설계하였다.

### [포 AT-09] Optical Design and Tolerance Analysis for UVO-Multiband Polarizing Imager System

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UVO-Multiband Polarizing Imager System

(UVOMPIS) is an ultraviolet to visible light multi-wavelength polarization/imaging system for Compact Advanced Satellite. We developed Linear Astigmatism Free-Three Mirror System (LAF-TMS) D200F2 as an optical system of UVOMPIS which has an entrance pupil diameter of 200 mm, a focal ratio of 2, a field of view of  $2^\circ \times 4^\circ$ . LAF-TMS is a confocal off-axis reflecting telescope system that removes linear astigmatism, and its all mirrors (M1, M2, M3) are optimized with the freeform surface to reduce high-order aberrations. Through the sensitivity analysis and Monte-Carlo simulation as the tolerance analysis, we can confirm the feasibility of the system, relatively sensitive parameters (tilt, decenter, despace, surface RMS error), and considerations for optomechanical design. From the sensitivity analysis, we can discover the relatively sensitive optical alignment parameters to a single perturbation. Further more, in the monte-carlo simulation, we investigate the minimum tolerance budget satisfying the required optical performance and whether the tolerance range is satisfied within manufacturing error.

## 우주론

### [포 CD-01] 'Mind the Mocking and don't Keep on Walking': Galaxy Mock Challenges for the Completed SDSS-IV Extended Baryon Oscillation Spectroscopic Survey

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We develop a series of N-body data challenges, functional to the final analysis of the extended Baryon Oscillation Spectroscopic Survey (eBOSS) Data Release 16 (DR16) galaxy sample, primarily based on high-fidelity catalogs constructed from the Outer Rim simulation. We generate synthetic galaxy mocks by populating Outer Rim halos with a variety of halo occupation distribution (HOD) schemes of increasing complexity, spanning different redshift intervals. We then assess the performance of three complementary redshift space distortion (RSD) models in configuration and Fourier space, adopted for the analysis of the complete DR16 eBOSS sample of Luminous Red Galaxies (LRGs). We find that all the methods are mutually consistent, with comparable systematic errors on the Alcock-Paczynski parameters and the growth of structure, and robust to different HOD prescriptions - thus validating the robustness