특히 2019년 및 2023년에 개최되는 WRC-19, 23회의 의제를 위해, 태양활동의 감시, 원활한 기상위성운영, 80-1,000GHz 대역의 전파천문 보호 등에 대한 연구가 관련 연구그룹(SG7)에서 본격화되고 있으며, 이에 대한 지속적인 동향분석과 국내의 입장정리 또는 관련 ITU 기술문서에 대한 정부차원의 적절한 대응정책이 필요하다.

따라서 본 발표에서는 WRC-19 및 WRC-23의제와 관련하여 2016년 4월 5-8일에 스위스 제네바에서 진행되었던 ITU-R 제7연구반 산하작업반별 회의의 공유연구와 주요 결과를 소개하고, 향후 우리나라의 입장, 대응방안 등에 대해 알아보고자 한다.

[포 AT-04] Software of Slit-Viewing Camera Module for IGRINS (Immersion GRating INfrared Spectrograph)

Hye-In Lee[1], Soojong Pak[1], Jae-Joon Lee[2], Gregory Mace[3], Daniel T. Jaffe[3]
[1]*School of Space Research, Kyung Hee University*
[2]*Korea Astronomy & Space Science institute*
[3]*Department of Astronomy, the University of Texas*

We developed an observation control software for the IGRINS (Immersion Grating Infrared Spectrograph) silt-viewing camera module, which points the astronomical target onto the spectroscopy slit and sends tracking feedbacks to the telescope control system. The point spread function (PSF) is not always symmetric. In addition, bright targets are easily saturated and shown as a donut shape. It is not trivial to define and find the center of the asymmetric PSF especially on a slit mask. We made a center balancing algorithm (CBA) following the concept of median. The CBA derives the expected center position along the slit-width axis by referencing the stray flux ratios of both upper and lower sides of the slit. We compared efficiencies of the CBA and those of a two-dimensional Gaussian fitting (2DGA) through simulations from observation images in order to evaluate the center finding algorithms. Both of the algorithms are now applied in observation and users can select the algorithm.

[포 AT-05] Wide band prototype feedhorn design for ASTE focal plane array

Bangwon Lee[1], Alvaro Gonzales[2], Jung-won Lee[1]
[1]*Korea Astronomy & Space Science Institute,*
[2]*National Astronomical Observatory of Japan*

KASI and NAOJ are making collaborating efforts to implement faster mapping capability into the new 275- 500 GHz Atacama Submillimeter Telescope Experiment focal plane array (FPA). Feed horn antenna is one of critical parts of the FPA. Required fractional bandwidth is almost 60 % while that of traditional conical horn is less than 50 %. Therefore, to achieve this wideband performance, we adopted a horn of which the corrugation depths have a longitudinal profile. A profiled horn has features not only of wide bandwidth but also of shorter length compared to a linear-tapered corrugated horn, and lower cost fabrication with less error can be feasible. In our design process the flare region is represented by a cubic splined curve with several parameters. Parameters of the flare region and each dimension of the throat region are optimized by a differential evolution algorithm to keep >20 dB return loss and >30 dB maximum cross-polarization level over the operation bandwidth. To evaluate RF performance of the horn generated by the optimizer, we used a commercial mode matching software, WASP-NET. Also, Gaussian beam (GB) masks to far fields were applied to give better GB behavior over frequencies. The optimized design shows >23 dB return loss and >33 dB maximum cross-polarization level over the whole band. Gaussicity of the horn is over 96.6 %. The length of the horn is 12.5 mm which is just 57 % of the ALMA band 8 feed horn (21.96 mm).

[포 AT-06] Development Plan for the GMT Fast-steering Secondary Mirror

Sugnho Lee[1], Jeong-Yeol Han[1], Chan Park[1], Ueejeong Jeong[1], Yang-noh Yoon[1], Je Heon Song[1], Bongkon Moon[1], Byeong-Gon Park[1], Myung K. Cho[2], Christoph Dribusch[2], Won Hyun Park[2], Youra Jun[2], Ho-Soon Yang[3], Il-Kwon Moon[3], Chang Jin Oh[4], Ho-Sang Kim[5], Kyoung-Don Lee[5], Robert Bernier[6], Paul Gardner[6], Chris Alongi[6], Andrew Rakich[6], Lee Dettmann[6], Wylie Rosenthal[6]
[1]*Korea Astronomy and Space Science Institute, Daejeon 34055, Republic of Korea;*
[2]*National Optical Astronomy Observatory, 950 N. Cherry Ave., Tucson, AZ 85719, USA;*
[3]*Korea Research Institute of Standards and Science, Daejeon 34113, Republic of Korea;*
[4]*University of Arizona, Tucson, AZ 85721, USA;*
[5]*Institute for Advanced Engineering, Yongin-si, Gyeonggi-do 17180, Republic of Korea;*
[6]*GMTO Corporation, 465 N. Halstead Street, Suite 250, Pasadena, CA 91107, USA*

The Giant Magellan Telescope (GMT) will feature two interchangeable Gregorian secondary mirrors, an adaptive secondary mirror (ASM) and a fast-steering secondary mirror (FSM). The FSM has