

of the models and the pipelines used for the baryon acoustic oscillation (BAO) and full shape clustering analysis. Our study is relevant for the final eBOSS DR16 'consensus cosmology', as the systematic error budget is informed by testing the results of analyses against these high-resolution mocks. In addition, it is also useful for future large-volume surveys, since similar mock-making techniques and systematic corrections can be readily extended to model for instance the DESI galaxy sample.

[포 CD-02] Model-independent reconstruction of the equation of state of dark energy

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While Dark Energy is one of the explanations for the accelerating expansion of the Universe, its nature remains a mystery. The standard (flat) Λ CDM model is consistent with cosmological observations: type Ia Supernova, BAO, CMB, and so on. However, the analysis of observations assuming a model, model-dependent approach, is likely to bias the results towards the assumed model.

In this poster, I will introduce model-independent approach with Gaussian process and the application of Gaussian process regression to reconstruct the equation of state of dark energy.

태양/태양계

[포 SS-01] 2019 Total Solar Eclipse Expedition of KASI

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Korea Astronomy and Space Science Institute (KASI) is developing a coronagraph to measure the coronal electron density, temperature, and speed utilizing spectral change of the K-corona around 400 nm. However, near UV light is more affected by atmospheric effect on the ground than visible light. For the total solar eclipse on July 2 2019, KASI organized an expedition team to test the possibility of the similar measurement scheme in the visible light. The observation site was in Las Flores, San Juan, Argentina. We built an imaging

spectrograph using micro lenslet array and grism, named Coronal Integral Field Spectrograph (CorIFS). In addition, images of white light corona, wide field background, and all sky were taken with various camera settings. We present the preliminary results of the expedition.

[포 SS-02] 30cm Wide-Field Solar Spectro-Imaging Telescope (Post SOFT)

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우주개발과 활용이 주요 화두가 된 현대에 보다 빠르고 정확한 우주환경 예보는 전략적으로 매우 중요하다. 이에 우리는 광대역태양영상분광망원경(Wide-Field Solar Spectro-Imaging Telescope, Post Solar Flare Telescope: PSOFT)을 활용한 태양전면 영상분광감시체계를 구성하고자 한다. 전세계 세 곳에 PSOFT를 배치하여 우주환경에 중대한 영향을 주는 요소인 태양의 플레어와 홍염 분출과 같은 현상과 표면의 다양한 활동들을 실시간으로 관측 분석하고자 한다. PSOFT는 30cm 구경의 광학계에 고속영상분광기를 결합하여 태양 전면의 분광영상을 약 1초각의 영상해상도와 5분의 시간해상도로 획득한다. 태양 전면을 슬릿으로 스캔하는 방식으로 H alpha와 Ca II 854.2nm선의 분광정보를 획득하는데 틸트 미러를 이용하여 1차적인 시상보정과 함께 스캔모션을 함께 구현함으로써 1)광학계 구조를 단순화하고, 2) 빠른 스캔이 가능하다. PSOFT로 얻은 태양전면 채층분광영상 데이터는 정밀한 우주환경 예보에 필요한 플레어나 홍염분출의 발생초기 정보를 제공할 뿐 아니라 태양 저층대기에서 발생하는 자기재연결, 파동 등에 대한 통계적 연구자료를 제공할 것으로 기대한다.

항성/항성계/외계행성

[포 SA-01] Photoionization and Raman-scattered He II features in young planetary nebulae

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Raman-scattered He II features are known to be present in several young planetary nebulae (PNe) including NGC 7027, NGC 6302, IC 5117 and NGC 6790. These features provide a new spectroscopic window to probe both thick neutral regions and far UV regions near Lyman series. We carry out

photoionization model calculations using 'CLOUDY' to explore He II emission strengths dependent on the physical conditions of the central star. The emission nebula is treated as a simple spherical shell with uniform density. It is found that detectable Raman-scattered He II are obtained for $T^* \sim 10^5$ K in the presence of a thick neutral component. We present mock spectra exhibiting Raman He II features based on the photoionization calculations and compare them with observed data.

We discuss effective strategies for searching young PNe with Raman-scattered He II emissivities.

[포 SA-02] The effects of the scattering opacity and the color temperature on numerically modelling of the first peak of type IIb supernovae

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A type IIb supernova (SN IIb) is the result of core-collapse of a massive star which lost most of its hydrogen-rich envelope during its evolution. The pre-SN progenitor properties, such as the total radius and the mass of the hydrogen-rich envelope, can widely vary due to the mass-loss history of the progenitors. Optical light curves of SNe IIb are dominated by energy released by the hydrogen recombination and the radioactive decay of ^{56}Ni in the early and late epochs respectively. This may result in distinctive double peaked light curves like the one observed in SN 1993J. The first peak, caused by the hydrogen recombination, can be modelled with numerical simulations providing information on the pre-SN progenitor properties. We compare two radiation-hydrodynamics codes, STELLA and SNEC, that are frequently used in SNe modelling, and investigate the effect of opacity treatment on the temporal evolution of the color temperature of SNe and eventually on the optical light curves. We find that with a proper treatment of the scattering opacity, SNe IIb models exploded from the progenitor models evolved with latest stellar evolution model hardly match the observational data. We also discuss the smaller scale features found in the models during hydrogen recombination phase.

[포 SA-03] Rapid Spectral Variability Monitoring of the Symbiotic Stars During One Night : CH Cyg, AG Dra, EG And

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공생별의 밝기 변화와 분광선 변화에 대한 지속적인 관측과 분석은 공생별 구성원의 구조, 거성으로부터의 질량 이동, 백색왜성 근처에서의 부착원반 형성과 이들의 진화에 대한 중요한 정보를 제공한다. 본 연구에서는 보현산 천문대 1.8-m 망원경과 고분산 예셀분광기 BOES를 이용하여 타 연구자에 의해 하룻밤 새 분광선 변화가 있다고 보고된 공생별 CH Cyg를 중심으로 AG Dra와 EG And의 방출선들에 대한 하룻밤 새 변화 모니터링 관측을 수행하였고, 이 세 공생별의 짧은 시간 내 분광적 변화 양상과 특성을 파악하고자 한다.

[포 SA-04] Flux-Limited Radiative Diffusion Module Applicable to Protoplanetary Disks

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Previous numerical simulations on planet-disk interactions revealed a lot of interesting phenomena including the planetary migration and the formation of many sub-structures inside the disks. However, these simulations were limited to an isothermal or adiabatic equation of state which does not account for various heating and cooling processes in the disks. Recent studies showed that the behavior of the planet-disk interaction can be significantly influenced by the disk thermodynamics. We develop a radiative diffusion module based on the two-temperature flux-limited diffusion approximation accounting for viscous heating and the accretion feedback. In this presentation, we describe our radiative diffusion solver, present some test results, and discuss potential applications of the module to planet-disk interactions.

[포 SA-05] evolution of massive stars in Case A binary systems and implications for supernova progenitors

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One of the distinctive characteristics of the evolution of binary systems would be mass transfer. Close binary systems experience so-called Case A mass transfer during the main-sequence. We have performed calculations of the evolution of massive Case A (with the initial period 1.5 ~ 4.5 days) binary systems with the initial mass of 10 ~ 20 solar masses and mass ratio 0.5 ~ 0.95 using the MESA code. We find that in some systems,