can impose the boundary normal current density exactly. We have tested the new force-free solver for standard Low & Lou fields and Titov-Demoulin flux ropes. Our code excels others in both examples, especially in Titov-Demoulin flux ropes, for which most codes available now yield poor results. Application to a real active region will also be presented.

항성/항성계/외계행성

[포 SA-01] A Hydrodynamic Study of Stellar Wind Accretion in S-type Symbiotic Stars

Young-Min Lee[1], Hyosun Kim[2] and Hee-Won Lee[1]
[1]Sejong University,[2]Korea Astronomy and Space Science Institute(KASI)

Symbiotic stars are wide binary systems of a white dwarf and a mass losing giant, exhibiting various activities mainly attributed to accretion of a fraction of slow stellar wind emanating from the giant. We perform 3 dimensional hydrodynamical simulations using the FLASH code to investigate the formation and physical structures of an accretion disk in symbiotic stars with binary separation in the range of 2-4 au. Radiative cooling is introduced in the flow in order to avoid acute pressure increase in the vicinity of the accretor that may prevent stable disk formation. By setting the same density condition in front of the bow shock generated in two different velocity fields, the role of ram pressure balancing between the disk and the wind is examined. We find that three main streams (direct stream from the giant, stream following the accretion wake, and stream passing through the bow shock front) all feed the disk, and their individual contributions on the mass accretion onto the white dwarf are explored.

[포 SA-02] High resolution spectroscopic monitoring of emission lines of symbiotic star AG Draconis

Soo Hyun Kim[1], Tae Seog Yoon[1], Hyung-il Oh[1]
[1]Kyungpook National University

보현산 천문대 1.8-m 망원경과 고분산 에셀 분광기 BOES를 이용하여 장기간 관측한 공생별 AG Draconis 방출선들의 모니터링을 통해 분광학적 특성을 보이고자 한다. 특히, 공생별 AG Draconis의 활동성 및 등급 변화에 따른 중성수소 Balmer 선과 주요 원소에 의한 방출선들의 특징과 변화 양상에 대해 살펴본다

[포 SA-03] Internal structure and kinematics of the massive star forming region W4

Beomdu Lim1, Hyeong-Sik Yun1, Gregor Rauw2, Yaël Nazé2, Jinyoung S. Kim3, Jeong-Eun Lee1, Narae Hwang4, Byeong-Gon Park4, Sunkyung Park1, Hwankyung Sung5, Seulgi Kim5

[1]Kyung Hee University, [2]Université de Liège, [3]University of Arizona, [4]Korea Astronomy and Space Science institute, [5]Sejong University

OB associations are young stellar systems on a few tens to a hundred parsec scale, and many of them are composed of multiple substructures. It is suggested that some hints about their formation process are probably imprinted on structural features and internal kinematics. In this context, we study the massive star forming region W4 in the Cassiopeia OB6 association using the Gaia proper motion data and high-resolution optical spectra taken from Hectochelle on MMT. We probe the structure and internal kinematics of W4 to trance its formation process. Several nonmembers with different kinematic properties are excluded in our sample. Some of them may be young stellar population spread over a large area of the Perseus spiral arm given their wide spatial distribution over 50 parsecs. W4 is composed of an central open cluster (IC 1805) and an extended stellar component. Their global expansion patterns are detected in stellar proper motion. In this presentation, we will further discuss the formation process of W4, based on the velocity dispersions of stars comprising these substructure.

우주론

[포 CD-01] Comparing distances obtained from galaxy scaling-relations with the help of group catalogues

Christoph Saulder (크리스토프 사울다)
Korea Institute for Advanced Study

Galaxy scaling relations, such as the Tully-Fisher relation and the fundamental plane can be used to derive redshift-independent distances. These two scaling-relations are valid for mutually exclusive morphological galaxy types, solid group catalogues are required to compare them within galaxy clusters hosting multiple galaxies. With our investigation, we aim to better understand systematic effects between the scaling rations that may cause potential biases in peculiar motion studies.