

scattering with atomic hydrogen. In this Monte Carlo study we investigate the flux ratio of 6825 and 7082 in a neutral region with a geometric shape of a slab, cylinder and sphere. By varying the amount of neutral hydrogen parametrized by the column density along a specified direction, we compute and compare the flux ratio of Raman scattered O VI 6825 and 7082. In the column density around 1020 cm<sup>-2</sup>, flux ratio changes in a complicated way, rapidly decreasing from the optically thin limit to unity the optically thick limit as the column density increases. It is also notable that when the neutral region is of a slab shape with the O VI source outside the slab, the optically thick limit is less than unity, implying a significant fraction of O VI photons escape through Rayleigh scattering near the boundary. We compare our high resolution CFHT data of HM Sge and AG Dra with the data simulated with finite cylinder models confirming that 'S' type symbiotic tend to be characterized by thicker HI region that 'D' type counterparts. It is expected that this study will be useful in interpretation of the clear disparity of Raman O VI 6825 and 7082 profiles, which will shed much light on the kinematics and the asymmetric distribution of O VI material around the hot white dwarf.

#### [포 ST-02] Preliminary Result of Exoplanet Transit Observation by NYSC 1m Telescope

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During the year 2016 the newly installed NYSC (National Youth Science Center) 1m optical telescope was officially commissioned. Calls for future observational programmes were announced. During test observations we carried out an observational project aimed at follow-up observations of transiting extrasolar planets. To predict future transits we developed the "TransitSearch" code implemented in Python utilizing transit information from the Open Exoplanet Catalogue. During three nights in April and June 2016 we observed planetary transits of HAT-P-3b and TrES-3b. Preliminary light curves of the transit events are presented alongside with best-fit models. From this experience we plan to improve the optical alignment and photometric performance by operating the 1m NYSC telescope in a strongly out-of-focus mode for transit observations.

#### [포 ST-03] High resolution spectroscopic observation study on six FU Orionis type stars

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FU Orionis 형 별들은 폭발 현상(outburst)을 일으키며 급작스럽게 변광 하는 전주계열(PMS) 변광성의 한 류(class)이다. 원형(prototype)인 FU Oriions를 비롯하여 이와 비슷한 분광 특성을 갖는 이 그룹은 FUors로 알려져 왔다. 이와 같은 유형의 별들이라도 주변 환경 및 원반의 활동에 따라서 광학 분광선들의 모양이나 특징은 다르게 나타난다. 2013년 2월부터 2016년 3월까지 보현산 천문대의 BOES 분광기로 6개의 FUors (FU Ori, V1057 Cyg, V1515 Cyg, HBC 722, V582 Aur, 2MASS J06593158-0405277)에 대한 고분산 스펙트럼을 얻었다. 발머선을 포함한 여러 파장대의 선들을 비교 분석 하였으며 주요 분광선의 변화 양상을 나타내고 그 변화 원인을 유추하고자 한다.

#### [포 ST-04] Relations between Gaussian width of Power Excess and Other Global Seismic Properties of Solar-like Stars from Main-sequence to Subgiant

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The Kepler space mission provides quantitative and qualitative photometric time series of oscillating stars. It is possible to examine statistical study with seismic properties of solar-like stars. Global seismic properties - large frequency separation ( $\Delta\nu$ ), frequency of maximum power ( $\nu_{\max}$ ) and amplitude of Gaussian envelope ( $A$ ) widely have been used to determine empirical scaling relations for inferring the stellar physical quantities - mass, age and temperature. We aim to confirm whether width of Gaussian envelope on power excess ( $\delta\nu_{\text{env}}$ ) can be used with parameter of scaling relation before redgiant phase using Kepler data. Therefore we analyze the characteristics of  $\delta\nu_{\text{env}}$  of 129 solar-like stars from main-sequence to subgiant. We have demonstrated that  $\delta\nu_{\text{env}}$  has highly correlations with global parameters -  $\Delta\nu$  and  $\nu_{\max}$ . We have also found the break of  $\delta\nu_{\text{env}}$  -  $\Delta\nu$  and  $\nu_{\max}$  relations.