

10 core-collapse supernovae in the near-infrared and visible wavebands. Our infrared data is from observations of the supernovae using the Wide Field Infrared Camera at the Palomar 5-m telescope as part of the Caltech Core-Collapse Supernova Program, while we obtain the visible data from publicly available data base. By fitting the broadband spectral energy distribution with a black body and, when necessary, modified black body component, we estimate physical parameters of the supernovae more accurately and also conduct a systematic investigation of when the supernovae show any indication of dust formation.

[7 ST-07] Time monitoring observations of H₂O and SiO masers toward semi-regular variable star R Crateris

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With the Korean VLBI Network (KVN), both single dish and VLBI monitoring observations of H₂O and SiO masers were performed toward the semi-regular variable star R Crateris. In the case of 11 VLBI monitoring observations from Jan. 5, 2014 to Jan. 7, 2016, successful superposed maps of H₂O and SiO masers were obtained at 7 epochs by adopting the Source Frequency Phase Referencing (SFPR) method. These results enable us to investigate the development of outflow and asymmetric motions from SiO maser to H₂O maser regions according to stellar pulsation which are closely related with a mass-loss process. Single dish monitoring observations of H₂O and SiO masers were also carried out from 2009 June to 2016 Feb. Intensity variations between H₂O and SiO masers were investigated according to stellar optical phases together with peak velocity variations with respect to the stellar velocity. We will compare the VLBI results among different maser transitions with those of single dish.

[7 ST-08] Calibrator Survey for evolved stars using the KVN

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We present results of a calibrator search near twenty evolved stars using the Korean VLBI

Network (KVN). Our evolved star targets include candidate sources for a Key Science Project (KSP) of the KVN. The KSP plans to investigate the spatial structure and dynamical effects between SiO and H₂O maser regions including mass-loss process and development of asymmetry in circumstellar envelopes of evolved stars. For these purposes, we need compact and strong extragalactic sources close to the evolved stars. We carried out 5 observations in order to detect radio continuum sources that can be used for source frequency phase-referencing (SFPR) -based analysis. We observed 153 sources, out of which we detected 29 at 22 GHz and 20 at 43 GHz at signal-to-noise ratios higher than 50 at all baselines. Therefore, we successfully found target and calibrator pairs for the KVN KSP.

[7 ST-09] Radial distribution of RGB stars in the Globular Clusters with multiple stellar populations

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Most globular clusters are now known to have two or more stellar populations with different chemical properties. In order to understand the origin and evolution of multiple stellar populations in these globular clusters, it is necessary to study not only the chemical property, but also the dynamical property. In our previous works (Lim et al. 2015; Han et al. 2015), we have shown that Ca narrow-band photometry can be combined with low-resolution spectroscopy to effectively study the chemical properties of globular clusters. In this talk, we will show our observations are also useful to study the radial distribution of stars in globular clusters with multiple stellar populations, and report our preliminary results.

[7 ST-10] Spectroscopic study of Planetary hosting star HD 20794

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We observed the high resolution spectra of a solar-neighborhood planetary hosting star HD 20794. The analysis of spectroscopic data was

performed using URAN and SYNTH programs. These spectra allow us to determine the effective temperatures, surface gravities, microturbulent velocities and, chemical abundances. Bond et al. (2008) found chemical abundance for 11 elements, but using the Spectrum synthesis method we have so far determine about 30 elements. We have derived iron metallicity $[Fe/H] = -0.42 \pm 0.03$, $[FeII/H] = -0.43 \pm 0.012$, and surface gravity, $\log g = 4.48$, in good agreement with values from previous investigation. This research was supported by the Korea Astronomy and Space Science Institute under the R&D program (Project No. 2015-1-320-18) supervised by the Ministry of Science, ICT and Future Planning.

[ㄱ ST-11] Bright stars observed by FIMS/SPEAR

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In this paper, we present a catalogue of the spectra of bright stars observed during the sky survey using the Far-Ultraviolet Imaging Spectrograph (FIMS), which was designed primarily to observe diffuse emissions. By carefully eliminating the contamination from the diffuse background, we obtain the spectra of 70 bright stars observed for the first time with a spectral resolution of $2\text{-}3\text{\AA}$ over the wavelength of $1370\text{-}1710\text{\AA}$. The far-ultraviolet spectra of an additional 139 stars are also extracted with a better spectral resolution and/or higher reliability than those of the previous observations. The stellar spectral type of the stars presented in the catalogue spans from O9 to A3. The method of spectral extraction of the bright stars is validated by comparing the spectra of 323 stars with those of the International Ultraviolet Explorer (IUE) observations.

태양 및 우주환경

[박 SS-01] Steady-State Solution for Solar Wind Electrons by Spontaneous Emissions

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The solar wind electrons are made of three or four distinct components, which are core Maxwellian background, isotropic halo, and super-halo (and sometimes, highly field-aligned strahl component which can be considered as a fourth element). We put forth a steady-state model for the solar wind electrons by considering both the steady-state particle and wave kinetic equations. Since the steady-state solar wind electron VDFs and the steady-state wave fluctuation spectrum are related to each other, we also investigate the complete fluctuation spectra in the whistler and Langmuir frequency ranges by considering halo- and superhalo-like model electron VDFs. It is found that the energetic electrons make important contributions to the total emission spectrum. Based on this, we complete the steady-state model by considering both the whistler and Langmuir fluctuations. In particular, the Langmuir fluctuation plays an important role in the formation and maintenance of nonthermal electrons.

[ㄱ SS-02] Comparison of Empirical Magnetopause Location Models with Geosynchronous Satellite Data

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In this study, we identify 307 the geosynchronous magnetopause crossing (GMC) using geosynchronous satellite observation data from 1996 to 2010 as well as make an observational test of magnetopause location models using the identified events. For this, we consider three models: Petrinec and Russell (1996), Shue et al. (1998), and Lin et al. (2010). To evaluate the models, we estimate a Probability of Detection (PoD) and a Critical Success Index (CSI) as a function of year. To examine the effect of solar cycle phase, we consider three different time periods: (1) ascending phase (1996-1999), (2) maximum phase (2000-2002), and (3) descending phase (2003-2008). Major results from this study are as follows. First, the PoD values of all models range from 0.6 to 1.0 for the most of years. Second, the PoD values of Lin et al. (2010) are noticeably higher than those of the other models. Third, the CSI values of all models range from 0.3