[박IM-07] A Study of Galactic Molecular Clouds through Multiwavelength Observations

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We focus on two Galactic molecular clouds that are located in wholly different environments and both are observed by FIMS instrument onboard STSAT-1. The Draco cloud is known as a translucent molecular cloud at high Galactic latitude. The FUV spectra show important ionic lines of C IV, Si IV+O IV], Si II* and Al II, indicating the existence of hot and warm interstellar gases in the region. The enhanced C IV emission inside the Draco cloud region is attributable to the turbulent mixing of the interacting cold and warm/hot media, which is supported by the detection of the O III] emission line and the Hα feature in this region. The Si II* emission covers the remainder of the region outside the Draco cloud, in agreement with previous observations of Galactic halos. Additionally, the H2 fluorescent map is consistent with the morphology of the atomic neutral hydrogen and dust emission of the Draco cloud. In the Aquila Rift region near Galactic plane, FIMS observed that the FUV continuum emission from the core of the Aquila Rift suffers heavy dust extinction. The entire field is divided into three sub-regions that are known as the- “halo,” “diffuse,” and “star-forming” regions. The “diffuse” and “star-forming” regions show various prominent H2 fluorescent emission lines, while the “halo” region indicates the general ubiquitous characteristics of H2. The CLOUD model and the FUV line ratio are included here to investigate the physical conditions of each sub-region. Finally, the development of an infrared imaging system known as the MIRIS instrument onboard STSAT-3 is briefly introduced. It can be used in WIM studies through Paα observations.

[구IM-08] Near-infrared Spectroscopy of Young Stellar Objects around the Supernova Remnant G54.1+0.3

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We present near-infrared (NIR) spectra of 6 young stellar objects (YSOs) around the supernova remnant G54.1+0.3 obtained with TripleSpec, a slit-based NIR cross-dispersion echelle spectrograph on th 5-m Palomar Hale telescope covering the entire NIR atmospheric window of 1-2.4 micron. These YSOs, whose formation was possibly triggered by the progenitor of G54.1+0.3, show significant mid-infrared (MIR) excess and have been proposed to be late O- and early B-type YSOs based on their spectral energy distribution. Our TripleSpec observations reveal the existence of strong H and He I lines, consistent with the previous interpretation of their spectral types, while the absence of Br-gamma emission line indicates that the YSOs do not have a nearby circumstellar disk.

We discuss the relation between these YSOs and G54.1+0.3 based on the TripleSpec data and previous photometric data as well.