[포SF-07] Herschel-PACS Observations of YSOs

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We observed several young stellar objects (YSOs) using the Photodetector Array Camera and Spectrometer (PACS) aboard the Herschel Space Observatory. CO, OH, H_2O, [O I], and [C II] lines were detected. CO rotational diagrams show two distinct gas components of ~400 K and ~1000 K with a break around 1500 K of the CO excitation energy, indicative of two different heating mechanisms: PDR and outflow shocks. OH and H_2O line fluxes can be fitted with temperatures different from what are derived from the CO rotational diagrams. In order to understand the physical environment of line formation, the sources were modeled with the 3-D radiative transfer code, LIME. We present the results of observations, simple analysis, and modeling of Herschel-PACS spectra of the YSOs.

[포SF-08] Astrophysical Jet Engine and the Rotating Disk-Jet System of NGC 1333 IRAS 4A2

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Astrophysical jets play important roles in many interesting astronomical phenomena, such as star formation, gamma-ray bursts, and active galactic nuclei. The jets are thought to be driven by rotating disks through magneto-centrifugal processes. However, quantitative understanding of the jet-driving mechanism has been difficult because examples showing rotation in both disk and jet are rare. One of the important quantities in the models of jet engine is the size of the jet-launching region. The bipolar jet of the NGC 1333 IRAS 4A2 protostar shows a lateral velocity gradient, which suggests that the SiO jet is rotating around its axis. The jet rotation is consistent with the rotation of the accretion disk. The disk-jet rotation kinematics suggests that the jet-launching region on the disk, or the outflow foot-ring, has a radius of about 2 AU, which supports the disk-wind models.