[포IM-15] Long-slit Spectroscopy of Parsec-scale Jets from YSOs

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We present a study on the parsec-scale jets from young stellar objects using long-slit spectroscopic data obtained from Bohyunsan Optical Astronomy Observatory on 2012 - 2014. Through the position-velocity diagrams, we show the radial velocity variation, peak velocity and velocity width of the outflow from several T Tauri stars and Herbig Ae/Be star. Hα, [OI] 6300/6363, [NII] 6548/6584 and [SII] 6716/6731 emission lines are obtained and they show various velocity features. We also compare our result with other data from literatures.

[포IM-16] "Dust, Ice, and Gas In Time" (DIGIT) Herschel Observations of GSS30-IRS1 in Ophiuchus

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As a part of the "Dust, Ice, and Gas In Time" (DIGIT) key program on Herschel, we observed GSS30-IRS1, a Class I protostar located in Ophiuchus (d =125 pc), with Herschel/Photodetector Array Camera and Spectrometer (PACS). More than 70 lines were detected within a wavelength range from 50 μm to 200 μm: CO lines from J = 14-13 to 41-40, several H_2O lines of E_{up} = 100 K to 1500 K, 16 transitions of OH rotational lines, and two atomic [O I] lines at 63 and 145 μm. The [C II] line, known as a tracer of externally heated gas by the interstellar radiation field, is also detected at 158 μm. All lines, except [O I] and [C II], are detected only at the central spaxel of 9".4 × 9".4. The [O I] emission is extended along a NE-SW orientation, which is consistent with the known outflow direction, while the [C II] line is detected over all spaxels. One possible explanation of the detection of the [C II] line and no correlation of its spatial distribution with any other molecular emission is the existence of the enhanced ISRF nearby GSS30-IRS1. One interesting feature of GSS30-IRS1 is that the continuum emission is extended beyond the point-spread function (PSF), unlike the molecular line emission, indicative of significant external heating. The best-fit continuum model of GSS30-IRS1 with the physical structure including flared disk, envelope, and outflow shows that the internal luminosity is 11 $L_{\odot}$, and the region is also externally heated by a radiation field enhanced by a factor of 25 compared to the local standard interstellar field.