## [구SF-03] A Small group of protostellar objects: L1251C

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We present various observational results toward a small group of Young Stellar Objects (YSOs), L1251C. Observations by Spitzer Space Telescope legacy program "From Molecular Cores to Planet Forming Disks" (c2d; Evans et al. 2003) revealed that there are three YSOs within  $\sim 15$  in L1251C: IRS1 (Class I), IRS2 (Class II), and IRS3 (Class II). In order to understand the molecular environment around these YSOs, we carried out the KVN single-dish observations in  $HCO^{+}$  J=1-0,  $H^{13}CO^{+}$  J=1-0,  $N_{2}H^{+}$  J=1-0 and HCN J=1-0. <sup>12</sup>CO J=1-0was also mapped in L1251C with the TRAO 14m telescope. Integrated intensity maps of high density tracers such as  $H^{13}CO^{+}$  J=1-0,  $N_2H^{+}$  J=1-0 and HCN J=1-0 show similar emission distributions, whose peaks are off the positions of YSOs. A compact  $HCO^{+}$  J=1-0 outflow and an extended  $^{12}CO$  J=1-0 outflow were observed, but their outflow axes are not cosistent (HCO+: NW-SE, 12CO: EW). However, the highest velocity component of the  $^{12}CO$  J=1-0 outflow shows similar morphology to the  $HCO^+$  J=1-0 outflow, and ~ 23 % of  $^{12}CO$  outflow momentum flux is loaded onto this high velocity component. Furthermore, continuum emission has been observed at 350, 450, 850 µm, and 1.3mm. With the KVN single dish, the 22 GHz H<sub>2</sub>O maser emission has been also monitored toward L1251C to find variations of the systemic velocity and intensity with time.

## [구SF-04] "Dust, Ice, and Gas In Time" (DIGIT) Herschel observations of GSS30-IRS1

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As part of the DIGIT key program, we observed GSS30-IRS1, a Class I object located in Ophiuchus (d=125 pc), with Herschel-PACS. More than 70 lines were detected in 50-200 micron band including CO, OH, H2O, and [OI]. All lines, except for [OI], were detected only at the central spaxel of 9.4"x9.4" while the [OI] emission is extended along the NE-SW direction. One interesting feature in GSS30-IRS1 is that the continuum is extended beyond PSF, unlike line emission. It suggests that the external heating is important in GSS30-IRS1. For detail analysis of line fluxes, we apply the non-LTE LVG model, RADEX as well as simple rotational diagrams. We also use the Monte Carlo radiative transfer package, RADMC-3D to understand the heating mechanism of dust grains around GSS30-IRS1. We will discuss about heating and cooling processes associated with GSS30-IRS1.