

[구SF-05] HCN and HNC observation toward three different phases of massive star formation

Mi-Hwa Jin¹, Jeong-Eun Lee¹, Kee-Tae Kim²
¹*School of Space Research, Kyung Hee University*
²*Korea Astronomy and Space Science Institute(KASI)*

It has been known that HCN is one of ubiquitous high-density gas tracer, and the abundance ratio between HCN and its Isomer, HNC sensitively depends on kinetic temperature in star-forming regions. Here we investigate the molecular abundance ratio toward three different evolutionary phases of massive star formation: Infrared Dark Clouds, High-mass Protostellar Objects and Ultracompact HII Regions.

We obtained the abundances of HCN and HNC using optically thin H13CN and HN13C lines observed with the KVN single-dish telescopes and MAMBO 1.2mm and SCUBA 850 μ m continuum data.

According to our results, the ratio of [HCN]/[HNC] increases statistically with the evolutionary stage, indicative of the effect of temperature. We also found a strong anti-correlation between the column density of molecular hydrogen and the HNC abundance.

[구SF-06] The warm CO gas along the UV-heated outflow walls: a possible interpretation for the Herschel-PACS CO spectra of embedded YSO

Seokho Lee¹, Jeong-Eun Lee², Edwin A. Bergin³ & Yong-Sun Park¹
¹*Seoul National University*, ²*Kyung Hee University*, ³*University of Michigan*

Part of mid-J CO emission detected by the Herschel/PACS observations of embedded young stellar objects (YSOs) has been attributed to the UV-heated outflow walls. We have applied our newly developed self-consistent models of Photon Dominated Region (PDR) and Non-LTE line Radiative transfer In general Grid (RIG) to the Herschel FIR CO observations. If the black body radiation of $T = 15,000$ K is used, the observed mid-J CO line fluxes can be produced in inner dense regions ($n \geq 10^6 \text{ cm}^{-3}$) with $-4.5 \leq \log G_{\text{dust}}/n \leq -2.5$, where gas temperatures are larger than 300 K and CO abundances are $\geq 10^{-5}$, along the UV-heated outflow walls. The contribution of the UV heated outflow cavity wall in Class I seems to be larger than that in Class 0.