[구SF-03] Identifying the bona fide VeLLOs in the Gould Belt's clouds

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We present results of searching for the Very Low Luminosity Objects (VeLLOs; internal luminosity Lint<0.1Lo) candidates in the Gould Belt's clouds using infrared observations from 3.6 to 70 micron by the Spitzer Space Telescope. More than 100 VeLLO candidates were selected through the criteria by Dunham et al. and our additional ones. The candidates in Northern sky were recently observed with high density tracers such as N2H+ (1-0) and HCN (1-0) using Korea VLBI Network (KVN) 21m telescope at Yonsei site to check their embeddedness in dense gas envelopes. A total of 25 out of 74 VeLLO candidates were detected in either N2H+ or HCN (1-0) line while 9 candidates were detected in both tracers. These are more likely bona fide VeLLOs which need to be studied further in future.

In this study the bolometric luminosities for 40 VeLLOs (25 from this study and 15 from Dunham et al.) were estimated and found to be significantly smaller than those given by various theoretical model tracks with constant accretion rate in a BLT diagram, indicating the constant accretion process suggested by standard star formation models can not explain the faintness of the VeLLOs. In the talk we will discuss on some possible explanation of why the VeLLOs are faint.

[구SF-04] FIR Observations and Simple LVG Modeling Results of L1448-MM

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We present Herschel-PACS observations of L1448-MM, a Class 0 protostar with a prominent outflow, part of the DIGIT Key Program (PI: N. Evans). We detect numerous emission lines including CO and H_2O rotational transitions, OH transitions, and [OI] forbidden transitions at wavelengths from 55 to 210 μm. The H_2O, [OI], mid-J CO ($J < 23$), and OH emission distributes along the outflow direction although high-J CO and other OH emission peaks at the central spatial pixel. According to our simple excitation analysis, CO seems to have two temperature components of warm and hot, which might be attributed to the PDR and shock, respectively. After exploring a wide range of physical conditions with a non-LTE LVG code, RADEX, we found that either shock alone or the combination of PDR and shock can explain the observations. The relative fraction of observed line luminosities suggest that L1448-MM is shielded from the UV radiation because H_2O and CO are the dominant coolants rather than OH and [OI]. In addition, our observed fluxes match better with C-shock models rather than J-shocks. The non-LTE LVG model supports that the IR pumping process is important for OH transitions because the OH line ratios are fitted much better when the dust thermal continuum is included.