Filaments and Dense Cores in Polaris Flare and California Molecular Cloud

Eun Jung Chung[1]; Chang Won Lee[1]
[1]*Korea Astronomy and Space Science Institute*

How dense cores and filaments in molecular clouds form is one of key questions in star formation. To challenge this issue we started to make a systematic mapping survey of nearby molecular clouds in various environments with TRAO 14m telescope equipped with 16 beam array, in high (N2H+, HCO+ 1-0) and low (C18O, 13CO 1-0) density tracers (TRAO Multi-beam Legacy Survey of Nearby Filamentary Molecular Clouds, PI: C. W. Lee). We pursue to dynamically and chemically understand how filaments, dense cores, and stars form under different environments.

We have performed On-The-Fly (OTF) mapping observations toward L1251 of Cepheus, Perseus west, MCLD123.5+24.9 of Polaris flare, Serpense, California, and Orion B. from January to March, 2017. In total, ~7.4 square degree area map of 13CO and C18O was simultaneously obtained with S/N of >10 in a velocity resolution of ~0.2 km/s. Dense core regions of ~2.2 square degree area where C18O 1-0 line is strongly detected were also mapped in N2H+ 1-0 and HCO+ 1-0. The Polaris flare is known to be most quiescent non-star-forming cloud and CMC is low- to intermediate-mass star-forming clouds, while the Serpens MC is an active low-mass star-forming cloud. The observed molecular filaments will help to understand how the filaments, cores and eventually stars form in a low to intermediate-mass star-forming environment. In this talk, I'll give a brief report on the observation and show preliminary results of Polaris and California MC.