1. Introduction

Important 3 keywords in this study:

- Ices around YSOs
- Origin of cometary and planetary ices
- Formation mechanisms of ices around YSOs

Extragalactic YSOs

- How do chemical conditions of materials around YSOs vary in other galaxy?
- Very few spectroscopic observations of ices toward extragalactic YSOs so far

The Large Magellanic Cloud (LMC)

- The nearest (~50kpc) irregular galaxy to our Galaxy
- An ideal environment for the study of extragalactic YSOs due to its proximity and low metallicity

2. AKARI Opened the Door of Spectroscopic Study of Extragalactic YSOs

AKARI, for the first time, conducted the systematic study of solid molecules around extragalactic YSOs, and discovered the following two important facts.

- Observational Fact 1 (Fig.4)
  Abundance of CO2 ice around LMC’s YSOs is higher than that of Galactic YSOs.

3. SPICA Expand the Possibility of Extragalactic YSO Study

Current studies of extragalactic YSOs are limited to

- Massive (luminous) YSOs
- Low-resolution spectroscopy

Wavelength coverage and high spatial resolution of SPICA/MCS enables detection of minor ice species and detailed comparisons with laboratory ice spectra.

Detailed comparison of observed ice feature with laboratory data is necessary to extract chemical composition of ice mantle.

4. SPICA

High sensitivity of SPICA/MCS enables spectroscopy of intermediate-mass YSOs in the LMC/SMC. This provides very important information for the understanding of the planet formation and its chemistry in metal-poor environment.

References

5. Shimonishi, T., et al., 2010, submitted to A&A