

## Diffuse interstellar PAH emission in the LMC observed with the AKARI/IRC

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We carried out mid-infrared slit spectroscopic observations of the diffuse ISM in the Large Magellanic Cloud (LMC) with the Infrared Camera (IRC) onboard AKARI. The target areas have been selected based on the criteria that the J = 1-0 transition of <sup>12</sup>CO is detected in the NANTEN survey and that the IRAS 60 $\mu$ m/100 $\mu$ m color distributes in a wide range.

Distinct unidentified Infrared (UIR) bands have been detected in most of the spectra except for one case at the boundary of supergiant shells (SGSs). The band ratios of 6.2 $\mu$ m/11.2 $\mu$ m, 7.7 $\mu$ m/11.2 $\mu$ m, 8.6 $\mu$ m/11.2  $\mu$ m have been measured. We find that the band ratios peaks at positions with an intermediate IRAS 60 $\mu$ m/100 $\mu$ m color of I(60/100) $\sim$ 0.5 and decreases at positions with lower or higher IRAS 60 $\mu$ m/100 $\mu$ m colors of I(60/100) $\sim$ 0.4 and I(60/100) $\sim$ 0.6 –0.7, respectively.

These band ratios are thought to be sensitive to the ionization state of PAHs. Assuming that ionization of PAHs is balanced by the photo-ionization and the recombination of electrons, it is a function of the ratio of the interstellar radiation field strength to the electron density. The regions with the intermediate I(60/100) value might be dominated by photo dissociation regions (PDRs) rather than ionized (HII) regions and the result implies that PDRs should offer the suitable environment for PAHs to be positively ionized.

In this presentation, we focus on the properties of PAHs at various positions in terms of interstellar radiation environments in the LMC.

### References

- [1] I.Sakon et al *Apj* **651**, 174 (2006).
- [2] I.Sakon et al *Apj* **609**, 203 (2004).