Star Formation and Dust Extinction Properties of Local Galaxies Seen from AKARI

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Accurate estimation of the star formation (SF)-related properties of galaxies is crucial for understanding the evolution of galaxies. In galaxies, ultraviolet (UV) light emitted by formed massive stars is attenuated by the dust which is also produced by the SF activity, and is reemitted at mid- and far-infrared wavelengths (IR).
In this study, we investigated the star formation rate (SFR) and dust extinction using data at UV and IR. We selected 2818 local galaxies which are detected at AKARI FIS 90 μm band. Then, we associated GALEX images for each galaxy. We measured flux densities at FUV (1530Å) and NUV (2310Å) from the GALEX images. We examined the SF and extinction by using *N60* (65 μm), *WIDE-S* (90 μm), *WIDE-L* (140 μm) and *N160* (160 μm) given by AKARI. Then, we calculated FUV and total IR luminosities, and obtained the so called SF luminosity (L_{SF}: the total luminosity related to star formation activity) and the SFR. We found that in most of galaxies, L_{SF} is dominated by L_{dust}. We also found that galaxies with higher SF activity have a higher fraction of SF hidden by dust. Especially, SF of galaxies which have SFRs > 20 M_{sun} yr^{-1} is almost completely hidden by dust. Next, we calculated the extinction (A_{FUV}) from L_{FUV} to L_{dust}. By this analysis, we found that the higher L_{SF} is, the higher A_{FUV} becomes.
Although these results were claimed by previous studies, confirming them precisely using a much larger samples from AKARI and GALEX all sky surveys has a great impact on our understanding of the SF in Local galaxies. I will also show some physical interpretations.
Keywords: dust; galaxies: formation; galaxies: evolution; stars: formation; infrared; ultraviolet.

References

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