X-RAY STUDY OF ULTRALUMINOUS INFRARED GALAXIES

ASCA results of IRAS20551–4250 and IRAS23128–5919

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We observed two ULIRGs, IRAS 20551–4250 and IRAS 23128–5919 with the X-ray satellite *ASCA*. Both of them are merger, $100\mu m$ bright galaxies with $L_{\rm IR} \sim 10^{12} L_{\odot}$ and have a "warm" *IRAS* color (25μm/100μm ≥ 0.2), so the presence of an AGN would be expected.

The *ASCA* spectrum of IRAS 20551–4250 can be characterized by two components, one of which is a soft thermal component ($kT \sim 0.3$ keV) and the other is a hard power-law component ($\Gamma \sim 1.8$) suffering from absorption ($N_{\rm H} \sim 10^{22}{\rm cm}^{-2}$). A strong line feature seen around 1.3 keV (He-like Mg?) suggests that a higher temperature component exists. IRAS 20551–4250 may have multi-temperature thermal emission similar to the well-known nearby starburst galaxy M82. Adding another higher kT component, the power-law index would be smaller. The observed X-ray luminosity is $\sim 2.5 \times 10^{42}$ ergs/s in the rest frame 2–10 keV band (assuming $H_0 = 50$ km/s/Mpc), $\log L_{\rm HardX}/\log L_{\rm IR} \sim -3.4$ which is smaller than the typical value of Seyfert galaxies ($-1 \sim -2$). If the hard X-ray emission is scattered light (as a Compton-thick source), the intrinsic luminosity of the central engine is much higher than estimated. However, we may see the central engine directly, because a significant Iron K line is not clearly seen and time variability might be found especially in the hard-band. IRAS23128–5919 also shows a hard spectrum ($L_{\rm X} \sim 3 \times 10^{42}$ ergs/s), though the soft component could not be recognized in contrast to the former since photon statistics are limited.

Since these targets are similar in infrared luminosity as well as in hard X-ray but not in soft X-ray, we can suggest that $L_{\rm FIR}$ would be associated with the hard X-rays.

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