AKARI Infrared Views of AGNs

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Abstract. The Japanese infrared satellite AKARI has unique capabilities for near-infrared spectroscopy and an all-sky survey in the mid- and far-infrared. We present the recent results on active galactic nuclei that use the unique capabilities of AKARI.

Keywords. galaxies: active, infrared: galaxies, quasars: emission lines

1. AKARI, the Japanese Infrared Satellite

AKARI, the Japanese infrared satellite, launched in 2006 February, has a 70-cm primary mirror cooled with the combination of liquid helium and mechanical coolers. It has unique capabilities for near-infrared spectroscopy in the wavelength range 2 μm to 5 μm, and carried out an all-sky survey in the mid- and far-infrared. It has broadband filters comprehensively covering near-, mid-, and far-infrared wavelengths (Murakami et al. 2007).

2. Near-Infrared Spectroscopy of High-Redshift Quasars

Near-infrared spectroscopy of the high-redshift quasars RX J1759.4+6638 at z = 4.3 and APM 08279+5255 at z = 3.9 led to detection of the Hα emission line at the highest redshift to date (Oyabu et al. 2007; Oyabu et al. 2009). In addition, for APM 08279+5255, the hydrogen recombination emission lines Paα and Paβ as well as the optically thick blackbody emission which comes from the inner part of dust torus were detected. Neither quasar provided any suggestion of evolution when compared with low-redshift quasars.

3. Mid-Infrared Search for Active Galactic Nuclei

Using the point source catalog from the AKARI mid-infrared all-sky survey, we are searching for AGNs, not only for normal AGNs but also for dusty AGNs, in the local Universe. Our detection limits in the mid-infrared all-sky survey reach 50 mJy and 120 mJy in 9 μm and 18 μm bands, respectively (Ishihara et al. 2009). AKARI provides remarkable improvement in sensitivity and spatial resolution compared to the previous all-sky survey with IRAS. Red mid-infrared sources away from the Galactic plane are observed using the near-infrared spectroscopy capability that remains since the cryogenic helium was exhausted. During these follow-up observations, we have started to detect hidden AGNs located in galaxies in which AGN activity was not recognized at other wavelengths (Oyabu et al. in preparation).

References