Near-infrared PAH features in the diffuse Galactic radiation

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The Infrared Camera (IRC) onboard AKARI provides a unique near-infrared (2.5–5μm) spectroscopic capability of high sensitivity. We have obtained 3.3, 3.4, and 3.5μm emission features in various Galactic objects with AKARI/IRC and investigated the correlation of the band ratios with the presence of ionized gas, which is indicated by Brα emission. These 3μm features are thought to come from the smallest members of the band carriers. They contain distinct information on aromatic (3.3μm) and aliphatic bonds (3.3–3.5μm) of C-H, which cannot be obtained from mid-infrared features. However, they have not been explored extensively due to the lack of sensitive spectrometer in the near-infrared until recently. AKARI/IRC has drastically changed the situation and its near-infrared spectroscopy offers the first opportunity to investigate the near-infrared features in various conditions in detail. We have also searched for features of deuterated PAHs in the 4μm region in these spectra, but no significant features have so far been found. We discuss possible processing of the band carriers and implication for deuterated PAHs.