Near-Infrared Spectroscopy of Diffuse Galactic Radiation with AKARI/IRC

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The Infrared Camera (IRC) on board AKARI offered high-sensitivity near-infrared (NIR) spectroscopy (2−5μm) even in its warm mission phase after the liquid helium had ran out (Onaka et al. 2007, PASJ, 59, S401; Onaka et al. 2010, SPIE 7731, 77310M). We present the results of IRC NIR spectroscopy of diffuse Galactic radiation, including Galactic HII-PDR complexes, reflection nebulae, and young stellar objects, during the warm mission phase of AKARI. The spectral region of 2−5μm is rich in the various emission and absorption features. The unidentified infrared (UIR) or polycyclic aromatic hydrocarbon (PAH) band emission at 3.3, 3.41, and 3.48μm is observed ubiquitously in addition to a number of hydrogen recombination lines originating from ionized gas. The spectra also often show H_2O and CO_2 ice absorption at 3 and 4.27μm, respectively. Some objects, such as supernova remnants, show a number of molecular hydrogen emission lines. Deuterated PAH features are also expected to be present in 4.4−4.7μm. In this presentation we will focus on the ice column density correlation, particularly its spatial variation in an object. We also report negative detection of significant excess emission in 4.3−4.7μm in the Orion and M17 larger than 3% of the 3μm UIR band emission and will discuss the deuterium depletion onto PAHs.