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An All-sky Look at the AME: Comparing the new AKARI/IRC Maps With IRAS and Planck Data

Aaron Bell, Takashi Onaka, Ronin Wu (U. Tokyo), Frederic Galliano (CEA), Daisuke Ishihara, Hidehiro Kaneda (Nagoya U.), Yasuo Doi, Takafumi Ohtsubo (U. Tokyo), Martin Giard (IRAP)

The anomalous microwave emission (AME) continues mystify those studying dust at both the infrared wavelengths, and on into the microwave domain. What physical mechanism/s produce this strongly dust-correlated foreground to pervade in the microwave domain? While we are not able to answer this question yet, we do provide evidence against one of the popular hypotheses: electric dipole emission from spinning polycyclic aromatic hydrocarbon molecules (PAHs). The AKARI space telescope, during its lifetime up until the cryogen depletion, contributed a wealth of data across the whole sky. We focus on the Infrared Camera (IRC) all-sky maps, centered at 9 and 18 μm , which are in the community data-verification phase. The 9 μm band offers a unique band-shape, and coverage of several major unidentified infrared band (UIR) features, otherwise called “the PAH features”. We have undertaken a comparison of the AKARI 9 μm data, as well as the other 6 AKARI all-sky maps, with the AME map released by the Planck Collaboration. 1-degree-scale aperture photometry, we demonstrate that there is a correlation between estimates of PAH abundance and AME at these angular scales, for low galactic latitudes. However, there is also a clear correlation with thermal dust emission. We investigate the AKARI/IRC data quality relative to the IRAS and Planck all-sky maps.