

AKARI All-Sky Far-Infrared Map

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Far-infrared observations are of crucial importance to investigate and characterise the properties of the interstellar matter, since the bulk of their energy is emitted in this wavelength range. We report results of a sensitive survey at this wavelength range using the Japanese AKARI satellite, to provide all-sky coverage with high spatial resolution. This survey covered >99% of the sky in four photometric bands, extending across the whole spectral region from 50 micron to 180 micron. The four filter band had centre wavelengths at 65 micron, 90 micron, 140 micron, and 160 micron, and achieved spatial resolutions of 1--2 [arcmin]. The detection limit of <10 [MJy sr⁻¹], with absolute and relative photometric accuracies of <20%, was achieved over the entire sky coverage. The first results from the all-sky imaging will be reported in this presentation. The data recover, for the first time, an all-sky image showing the distribution at the peak of the dust-continuum emission, of interstellar material with arc-minute spatial resolution. This has enabled us to investigate the large-scale distribution of the ISM in great detail; in particular we report estimates of its thermal dust temperature, emissivity and column density. We find that the temperature of the dust particles in thermal equilibrium with the ambient interstellar radiation field can be estimated by using 90 micron, 140 micron, and 160 micron data as a proxy to estimate the spatial variation of the strength of the interstellar radiation field. At the same time, the dust mass distribution, inferred from the dust column density, is an excellent tracer of the distribution of interstellar matter throughout the Galaxy, and beyond. A significant contribution to this emission comes from stochastically heated small dust particles, which are expected to be especially prevalent at shorter wavelengths - especially in the 65 micron band.

It is planned that these data will be made publicly available in Summer 2012, after a short proprietary period for the project team members.