

赤外線衛星「あかり」による黄道光微細構造の観測 Small-scale structure of the zodiacal dust cloud observed in mid- and far-infrared with AKARI

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The zodiacal light emission (ZE) is the thermal emission from the interplanetary dust and the dominant diffuse radiation in the mid- to far-infrared wavelength region. The zodiacal dust cloud has a relatively smooth distribution. However, from the results of the Infrared Astronomy Satellite (IRAS) observations, it was found that there are many small-scale structures in the ZE distribution, such as asteroidal dust bands and a circumsolar resonance ring.

The Japanese infrared satellite AKARI, a dedicated satellite for infrared astronomical observations, is the mission to survey the whole sky in the mid- and far-infrared. AKARI detected the small-scale structure of the zodiacal cloud, such as the asteroidal dust bands and the circumsolar ring. There are three major bands (± 1.4 degree, ± 2.1 degree, and ± 9.3 degree) among dust bands that form small-scale latitude features in the ZE. These three prominent asteroidal dust bands can be clearly seen in the AKARI far-infrared all-sky maps at 65 and 90 micron bands.

We also present spectra of the zodiacal light observed in mid-infrared wavelength region with Infrared Camera (IRC) onboard AKARI. The IRC spectra (5.5–12.5 micron) show a trapezoidal excess emission feature in 9–11 micron region which can be reasonably accounted for by a combination of amorphous and/or crystalline silicate. Although this excess feature is rather smooth and lacking sharp peaks, a possible 10.5 micron peak and small peaks around 9.3 and 11.35 micron can be seen at the shoulder of the trapezoidal excess. The spectrum around $\beta=10$ degree toward the asteroidal dust band seems to have a slight different shape of the silicate feature from those of other regions.

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