The simulation code for the infrared whole sky survey with the Far Infrared Surveyor (FIS) on board the ASTRO-F

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The ASTRO-F is the mission for the infrared (IR) astrophysics, and is planed to be launched in early 2004 by M-V rocket of the ISAS (Murakami 1998). Two focal plane instruments are designed for the ASTRO-F; the Far-Infrared Surveyor (FIS; Kawada et al. 1998), and the InfraRed Camera (IRC; Matsuhara et al. 1998). The overview of the ASTRO-F is presented by Yamamura in this issue. The FIS covers from 50 to 200 μm and IRC observes from 1.8 to 26 μm. The ASTRO-F has two observing modes (survey mode and pointing mode). The survey mode is specified for the whole sky survey with the FIS. For the purpose of the evaluation of the instrument performance, we established the simulation program for the survey mode with the FIS.

The FIS observes in four wavelength bands; WIDE-L (110–200 μm), N170 (150–200 μm), WIDE-S (50–110 μm), and N60 (50–75 μm). WIDE-L and N170 are equipped with stressed Ge:Ga detector arrays (Makiuti et al. 1998) with 15$\times$3 and 15$\times$2 elements, and WIDE-S and N60 are equipped with unstressed Ge:Ga detector arrays (Hiromoto et al. 1998) with 20$\times$3 and 20$\times$2 elements, respectively. Here, we discuss WIDE-L covering 110–200 μm as an example. Since a detector element for WIDE-L is 50$\times$50 arcsec^2, which is larger than the diffraction limit at 110 μm (36 arcsec), the detector elements have been designed to be tilted 26.5 degrees with respect to the scan direction (Kawada 1998). This configuration satisfies the filling rate of sampling points of $\approx$25 arcsec in perpendicular to the scan direction. We show that this configuration performs satisfactorily accurate photometry. The necessity of the color correction for the wide wavelength bands are also discussed.

References:

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