



Infrared Array Camera (IRAC)

<http://ssc.spitzer.caltech.edu/irac/>



Basic Warm IRAC Capabilities and Sensitivity

IRAC during the warm mission has two operational channels that provide simultaneous 5.2 arcmin X 5.2 arcmin images at 3.6 and 4.5 microns. Two adjacent fields of view are imaged. Both detector arrays are 256 X 256 pixels in size, with a pixel size of 1.2 arcsec X 1.2 arcsec. IRAC provides capabilities for high dynamic range and subarray imaging of bright sources as well as mapping in array or celestial coordinates. The option to collect data in only one channel exists. Several dither patterns are also available. The maximum duration of an IRAC observation is 24 hours. IRAC observing parameters are specified within the IRAC Post-Cryo Mapping observation template in Spot.

Table 1. IRAC characteristics.

Channel No.	Array material	Wavelength (μm)	Read noise (e-; 30 sec)	Well depth (e-)	Noise pixels (Npix)	Typical background (MJy/sr)
1	InSb	3.6	8.6	145,000	7.0	0.15
2	InSb	4.5	7.5	140,000	7.2	0.44

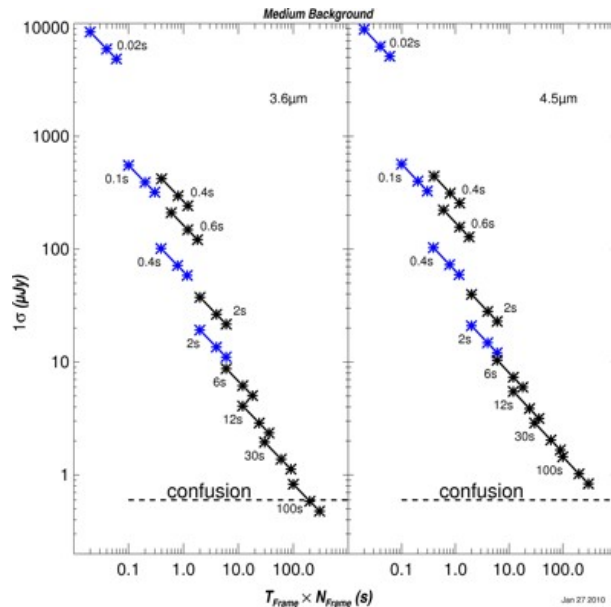


Figure 1: Point source sensitivity plots for medium background. The lines show S/N = 1 detection levels at the indicated frame times T_f . For diffuse emission, the surface brightness sensitivity per pixel is approximately $0.03/(N_{\text{pix}})^{1/2}$ MJy/sr times the point source sensitivity in micro-Jy. N_{pix} is the number of pixels contributing to the calculated point source noise. Allowed frame times range from 0.02 seconds in subarray mode to 100 seconds in full array mode.

Saturation

In a 30 second exposure on a point source, the IRAC saturation levels are ~ 13 mJy at 3.6 μm . Long frames are background limited.

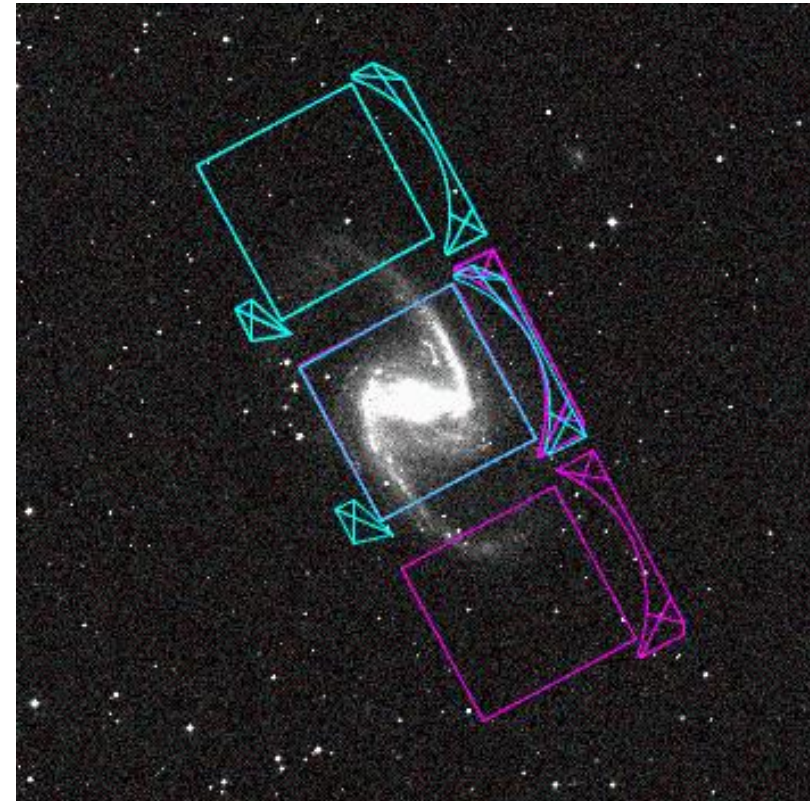


Figure 2. IRAC fields of view shown on top of a DSS image of NGC 1365. If both fields of view are selected for mapping, a pair of detectors will take an image centered on the target coordinates, while the other two detectors will image an adjacent field of view. The centers of the two fields of view are separated by 6.5 arcmin. The smaller rectangles are locations of IRAC stray light avoidance zones.