INFRARED CAMERA (IRC)

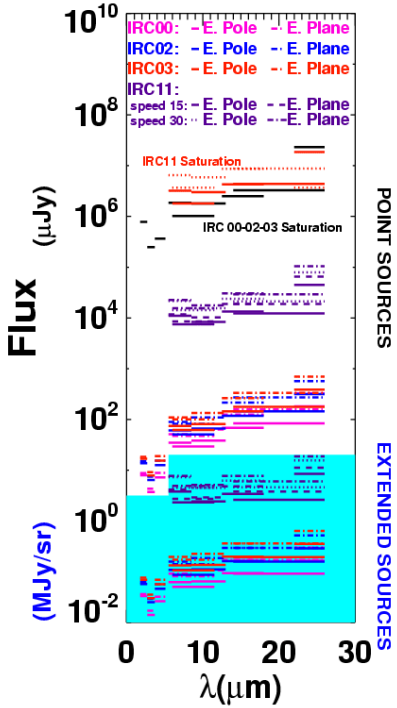
The Infrared Camera (IRC) instrument will carry out an All-Sky Survey at 9 and 18 μm and will perform pointed observations in 9 photometric bands and 5 spectroscopic elements in the 2 – 26 μm range.

Basic IRC Capabilities: The IRC consists of three cameras: NIR, MIR-S & MIR-L. Each camera is equipped with a set of filters and dispersion elements. The filters can be chosen from a limited number of pre-determined combinations defined in each AOT. Only NIR and MIR-S share the same FoV. This means that at least two pointed observations in different revolutions are needed to observe a particular position with all three cameras.
An IRC pointed observation consists of an *n* times repeated exposure cycle and various operations between them (micro-scan and filter changes). One exposure cycle takes about 70 s in the current design, during which NIR carries out one short and one long exposures, and MIR cameras carry out one short and three long exposures.

Instrument Performance tool: http://astro-f.esac.esa.int/tools/IPT.shtml

Channel	FoV (arcmin²)	Array size (pixel²)	Pixel size (arcsec²)
NIR	9.5x10.0	512x412	1.46x1.46
MIR-S	9.1x10.0	256x256	2.34x2.34
MIR-L	10.3x10.2	256x256	2.51x2.39

IRC Imaging: 5σ detection and saturation limits for a pointed observation in imaging mode (IRC 00-02-03 and 11), computed at the ecliptic pole and at the ecliptic plane.
IRC11 values correspond to two different scan speeds (15 and 30 arcsec/sec).
Point source detection limits are given in μJy and extended source detection limits in MJy/sr.



Channel	Filters	λ (μm)
NIR	N2	1.7-2.7
	N3	2.7-3.7
	N4	3.7-5.5
MIR-S	S7	5.8-8.4
	S9W	6.5-11.6
	S11	8.6-14.1
MIR-L	L15	12.4-19.4
	L18W	13.9-25.3
	L24	20.4-26.5

IMAGING AOTs & FILTER SELECTION

IRC AOTs & Purpose	Filters/ channel	Dithering Pos/filter	Requested #pointing
00 Deep imaging	1	No	≥ 3
02	2	3	≥ 1
03	3	2	≥ 2
11 Slow-Scan	1	N/A	≥ 1

	NIR	MIR-S	MIR-L
	OPTIONS (one of the tree sets)		
IRC00	N2	S9W	L18W
	N3	S7	L15
	N4	S11	L24
IRC02	N3&N4	S7&S11	L15&L24
IRC03	N2&N3&N4	S7&S9W&S11	L15&L18W&L24
	OPTIONS (one of the three sets)		
IRC11	N/A	S9W	L18W
	N/A	S7	L15
	N/A	S11	L24

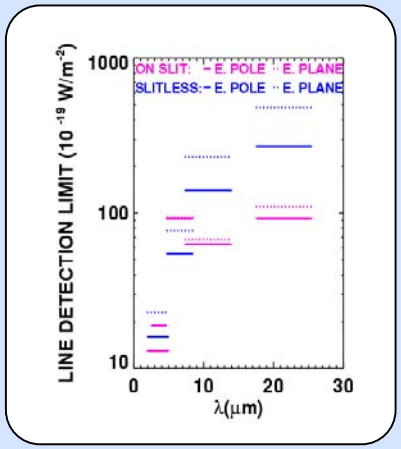
IRC Spectroscopy: The MIR-S and MIR-L cameras always observe with the available dispersion elements (2 GRISM for MIR-S and one for MIR-L), while only one of the NIR dispersion elements (NP: PRISM; NG: GRISM) can be selected at a time.
A short exposure image will be taken for pointing alignment.
A slit is provided in each camera in order to observe diffuse radiation. The NIR camera has also an entrance aperture (slit) for point source confusion-less spectroscopy.

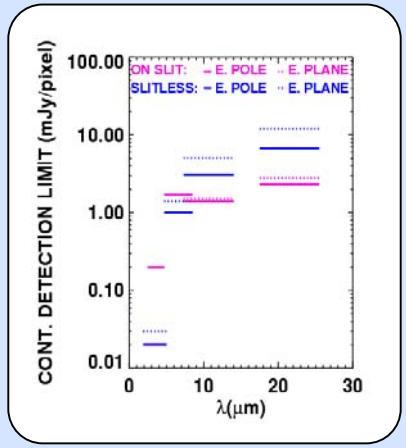
Channel	Dispersion elem.	λ (μm)	Resolution (λ/Δλ)
NIR	NP	1.7-5.5	22@3.5μm
	NG	2.5-5.0	135@3.6μm
MIR-S	SG1	5.5-8.3	47@6.6μm
	SG2	7.4-13.0	34@10.6μm
MIR-L	LG2	17.7-25.0	27@20.2μm

SPECTROSCOPIC AOT & DISPERSION ELEMENT SELECTION

IRC AOT	Filters/ channel	Dithering Pos/filter	Requested #pointing
04	1(NIR&MIR-L) 2(MIR-S)	No	≥ 2

NIR	MIR-S	MIR-L
NP (N3)	SG1&SG2 (S9W)	LG2 (L18W)
NG (N3)	SG1&SG2 (S9W)	LG2 (L18W)





5σ detection limits for a pointed observation, in the ecliptic pole and the ecliptic plane. Line detection limits are given for integrated line fluxes. Continuum detection limits are given per pixel. Integrating over the area of the resolution bin and over the image size can improve the detection.