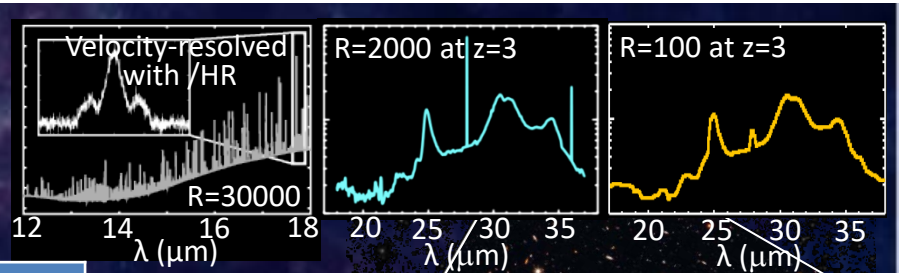
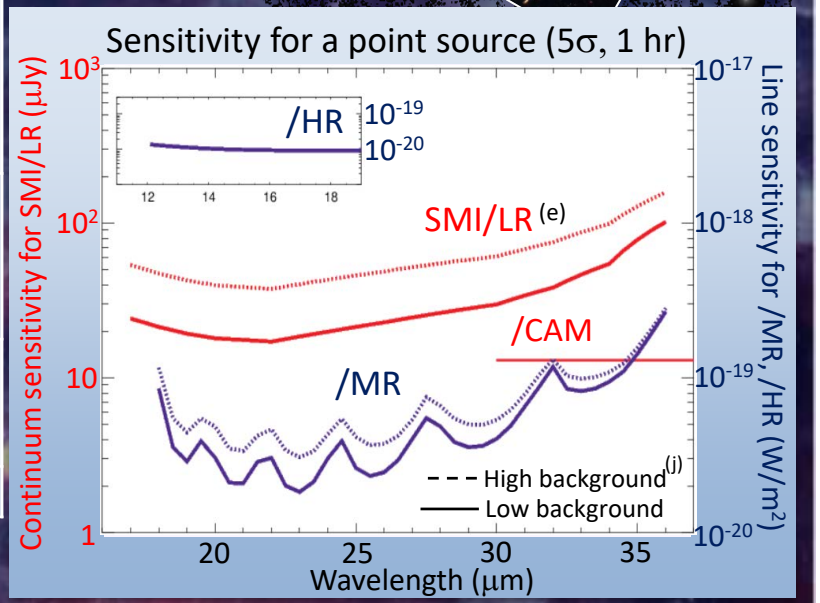
SPICA / SMI Fact Sheet

SPICA Mid-infrared Instrument (SMI) covers the wavelength range of 12–36 μm with four channels: spectroscopy (SMI/LR, /MR, /HR) and imaging (/CAM).



Parameter	SMI /LR	/CAM Slit viewer for SMI /LR	/MR	/HR
Band centre - μm	27	34	27	15
Wavelength - μm	17 – 36	34	18 – 36	12 – 18 (a)
Spectral resolution *R*	50 – 150 (b)	5	1300 – 2300 (b)	33000 (c)
(diffuse source)	(20 – 110)		(1100-1400)	
Field of view	600" x 3.7"	600" x 720"	60" x 3.7"	4" x 1.7"
	4 slits		1 slit	1 slit
Band centre FWHM	2.7"	3.5"	2.7"	2"
Pixel scale	0.7" x 0.7"	0.7" x 0.7"	0.7"	0.7"
Detector 1K x 1K	Si:Sb	Si:Sb	Si:Sb	Si:As
Point source sensitivity (5 σ/1 hr)(d)				
Continuum - μJy	25 (e)	13	280 (e)	1400 (e)
Line - 10^{-20} W/m^2 (f)	5		2.8	1.0
Survey speed - arcmin^2/hr (g)	~28	~4500	~1.8	
Diffuse source sensitivity (5σ/1 hr)(d)(h)				
Continuum - MJy/sr	0.08	0.05		
Line - 10^{-10} W/m^2/sr			1.0	0.8
Saturation limit – Jy	~20	~1	~1000	~20000



(a) continuous coverage up to 18.1 μm + partial coverage for H_2O 18.66 μm.
(b) λ/δλ = 150 (SMI/LR) and 1300 (/MR) at λ = 36 μm.
(c) designed for λ20 μm diffraction limited PSF.
(d) sensitivity estimated with Fowler-16 sampling for SMI/LR and /CAM (0.5 Hz), and with ramp curve sampling for /MR (0.5 Hz) and /HR (1 Hz sampling).
(e) continuum sensitivity rescaled with R = 50, R = 1300, and R = 25000 for SMI/LR, /MR and /HR, respectively.
(f) sensitivity for an unresolved line.
(g) survey speed for the 5 σ detection of a point source with the continuum flux of 100 μJy for SMI/LR at λ = 30 μm (/CAM at 34 μm) and the line flux of 3x10^{-19} W/m^2 for /MR at λ = 28 μm, both in the low background case with overheads of readout time included (32 sec/frame for SMI/LR and /CAM due to Fowler-16 sampling).
(h) sensitivity for a diffuse source in a 4" x 4" (SMI/LR , /MR) or 2" x 2" area (/HR).
(i) background levels are assumed to be 80 MJy/sr (High) and 15 MJy/sr (Low) at 25 μm.

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