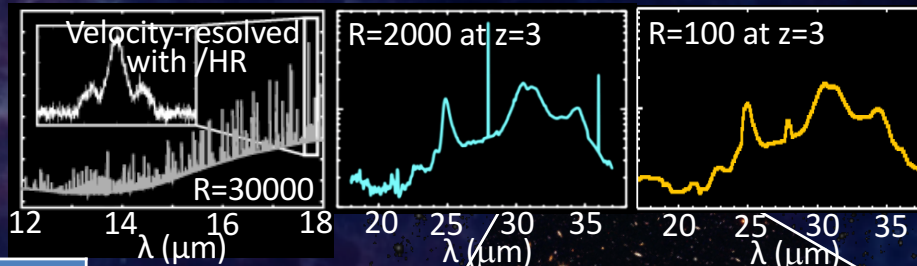
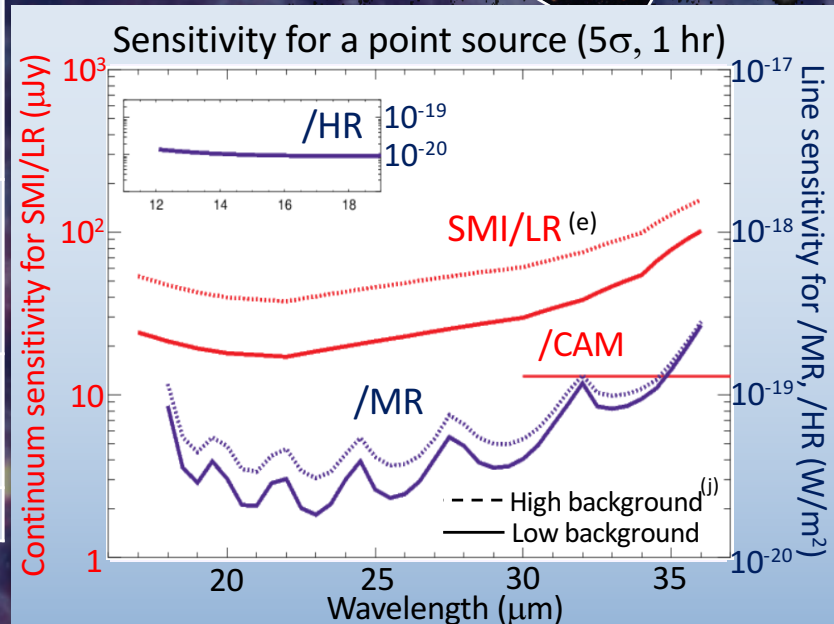
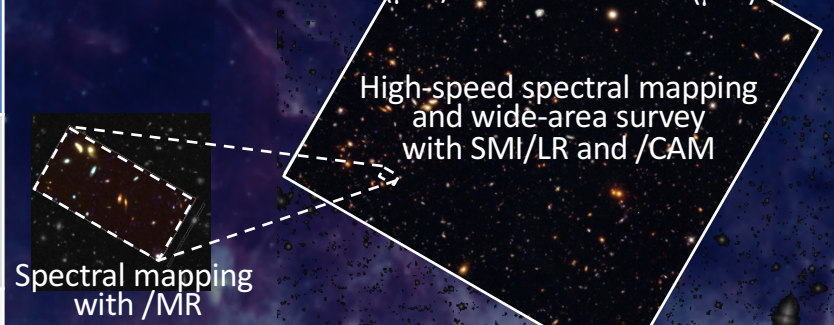


# SPICA / SMI Fact Sheet

SPICA Mid-infrared Instrument (SMI) covers the wavelength range of 12–36  $\mu\text{m}$  with four channels: spectroscopy (SMI/LR, /MR, /HR) and imaging (/CAM).



Parameter	SMI /LR	/CAM Slit viewer for SMI /LR	/MR	/HR
Band centre - $\mu\text{m}$	27	34	27	15
Wavelength - $\mu\text{m}$	17 – 36	34	18 – 36	12 – 18 <sup>(a)</sup>
Spectral resolution R (diffuse source)	50 – 150 <sup>(b)</sup> (20 – 110)	5	1300 – 2300 <sup>(b)</sup> (1100-1400)	33000 <sup>(c)</sup>
Field of view	600" x 3.7" 4 slits	600" x 720"	60" x 3.7" 1 slit	4" x 1.7" 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 $\sigma$ /1 hr) <sup>(d)</sup>				
Continuum - $\mu\text{Jy}$	25 <sup>(e)</sup>	13	280 <sup>(e)</sup>	1400 <sup>(e)</sup>
Line - $10^{-20}$ W/m <sup>2</sup> <sup>(f)</sup>	5		2.8	1.0
Survey speed - arcmin <sup>2</sup> /hr <sup>(g)</sup>	~28	~4500	~1.8	
Diffuse source sensitivity (5 $\sigma$ /1 hr) <sup>(d)(h)</sup>				
Continuum - MJy/sr	0.04	0.05		
Line - $10^{-10}$ W/m <sup>2</sup> /sr			0.6	1.5
Saturation limit – Jy	~20	~1	~1000	~20000



(a) continuous coverage up to 18.1  $\mu\text{m}$  + partial coverage for H<sub>2</sub>O 18.66  $\mu\text{m}$ .

(b)  $\lambda/\delta\lambda = 150$  (SMI/LR) and 1300 (/MR) at  $\lambda = 36$   $\mu\text{m}$ .

(c) designed for  $\lambda 20$   $\mu\text{m}$  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  $\sigma$  detection of a point source with the continuum flux of 100  $\mu\text{Jy}$  for SMI/LR at  $\lambda = 30$   $\mu\text{m}$  (/CAM at 34  $\mu\text{m}$ ) and the line flux of  $3 \times 10^{-19}$  W/m<sup>2</sup> for /MR at  $\lambda = 28$   $\mu\text{m}$ , 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  $\mu\text{m}$ .