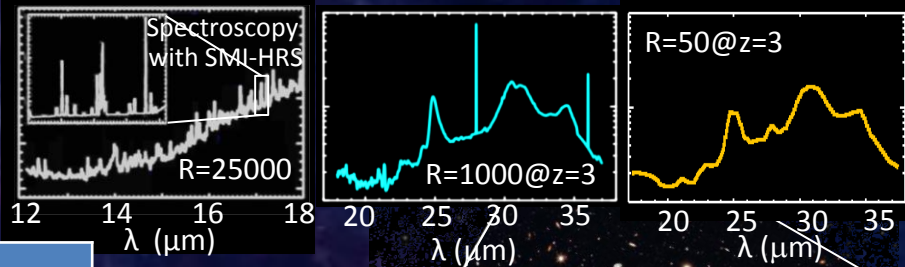
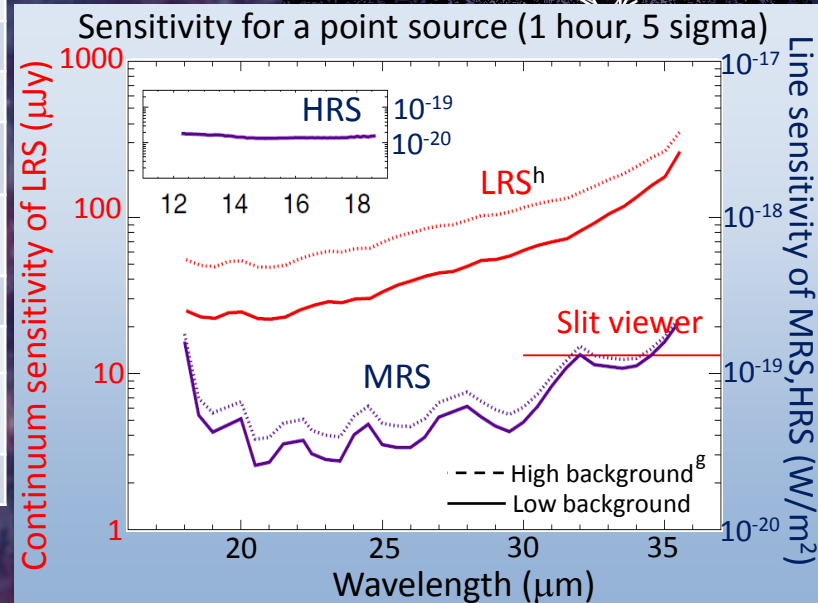
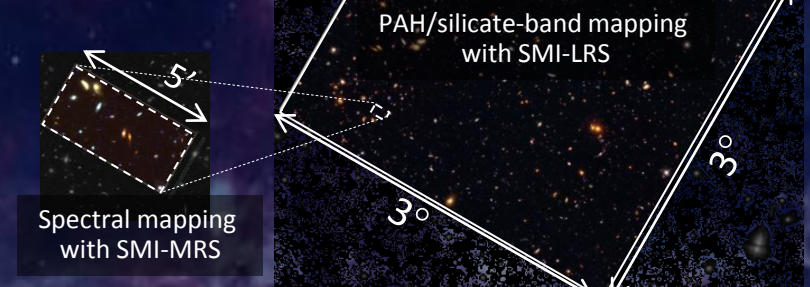


# SPICA / SMI Fact Sheet

SPICA Mid-infrared Instrument (SMI) covers the wavelength range of 12–36  $\mu\text{m}$  with three spectroscopic channels: LRS, MRS, and HRS.



Parameter	Function				
	LRS		MRS	HRS	
	Multi slit spec.	Slit viewer			
Wavelength range	17 – 36 $\mu\text{m}$	34 $\mu\text{m}$	18 – 36 $\mu\text{m}$	12 – 18 $\mu\text{m}$ <sup>a</sup>	
Spectral resolution	50 – 120 <sup>b</sup> (point source) 20 – 110 (diffuse)	5	1300 – 2300 <sup>b</sup> (point source) 1100 – 1400 (diffuse)	28000 <sup>c</sup>	
Field of View	600" x 3.7" x 4 slits	600" x 600"	60" x 3.7" (slit)	4" x 1.7" (slit)	
FWHM	2."0 (20 $\mu\text{m}$ ) – 3."6 (36 $\mu\text{m}$ ), 2."0 (12 – 20 $\mu\text{m}$ )				
Pixel scale	0."7 x 0."7	0."7 x 0."7	0."7	0."5	
Detector	Si:Sb 1K x 1K	Si:Sb 1K x 1K	Si:Sb 1K x 1K	Si:As 1K x 1K	
Point source	Cont. sensitivity (1 hr, 5 sigma)	20 – 200 $\mu\text{Jy}$	13 $\mu\text{Jy}$	300 – 3000 $\mu\text{Jy}$	2 – 3 mJy
	Line sensitivity <sup>d</sup> (1 hr, 5 sigma)	(8 – 20) x 10 <sup>-20</sup> W/m <sup>2</sup>	-	(3 – 20) x 10 <sup>-20</sup> W/m <sup>2</sup>	(1.5 – 2) x 10 <sup>-20</sup> W/m <sup>2</sup>
	Survey speed <sup>e</sup>	~16 arcmin <sup>2</sup> /hr	~5900 arcmin <sup>2</sup> /hr	~1.5 arcmin <sup>2</sup> /hr	-
Diffuse	Sensitivity <sup>f</sup> (1 hr, 5 sigma)	Continuum		Line	
		0.02– 0.1 MJy/sr	0.05 MJy/sr	(0.7 – 4) x 10 <sup>-10</sup> W/m <sup>2</sup> /sr	(1.5 – 2) x 10 <sup>-10</sup> W/m <sup>2</sup> /sr
Saturation limit		~20 Jy	~1 Jy	~1000 Jy	~20000 Jy



a: continuous coverage up to 17.3  $\mu\text{m}$  + partial coverage for H<sub>2</sub>O 17.77 and 18.66  $\mu\text{m}$

b:  $\lambda/\delta\lambda = 120$  (LRS) and 1300 (MRS) at  $\lambda = 36 \mu\text{m}$ .

c: designed for  $\lambda 20 \mu\text{m}$  diffraction limited PSF.

d: sensitivity for an unresolved line.

e: survey speed for the 5 sigma detection of a point source with the continuum flux of 100  $\mu\text{Jy}$  for LRS at  $\lambda = 30 \mu\text{m}$  (slit viewer at 34  $\mu\text{m}$ ) and the line flux of  $3 \times 10^{-19} \text{ W/m}^2$  for MRS at  $\lambda = 28 \mu\text{m}$ , both in the low background case (see the right-hand figure).

f: sensitivity for a diffuse source in a 4" x 4" (LRS & MRS) or 2" x 2" area (HRS)  
g: background levels are assumed to be 80 MJy/sr (High) and 15 MJy/sr (Low) at 25  $\mu\text{m}$ .

h: continuum sensitivity rescaled with R=50

