Wavelength range: **250 - 600 µm**
(500 - 1200 GHz)

The spectral resolution plotted corresponds to the FWHM of the instrument line spread function for a monochromatic line from a point source.

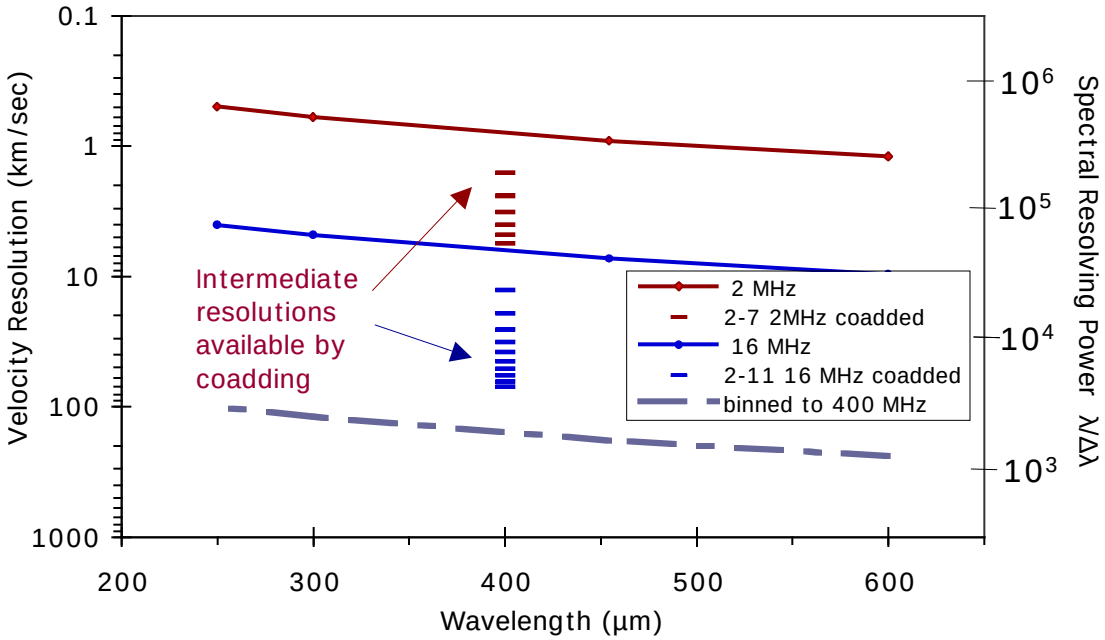
Flight configuration is two cryostats each containing two receivers, 4 bands available total. Each receiver has 150 GHz tuning range, and an instantaneous bandwidth of 4 GHz.

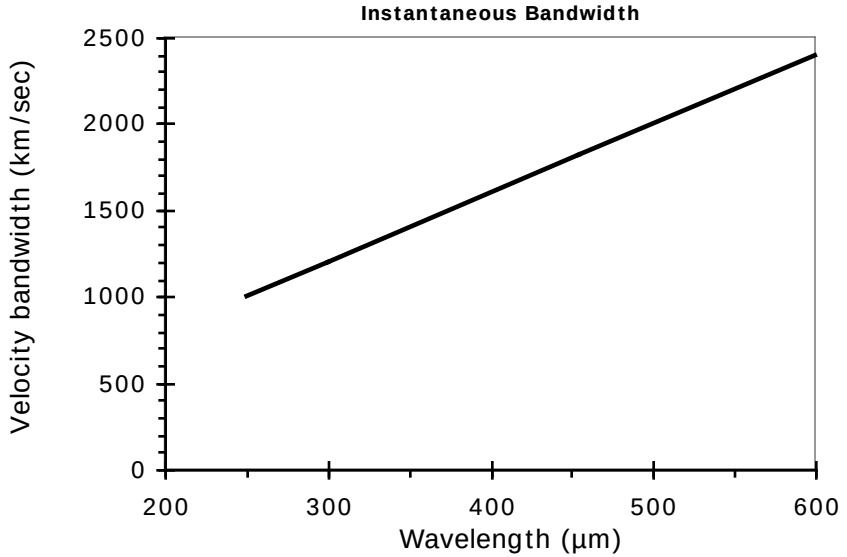
Spectrometer "back ends" will be available with resolutions of 2 MHz and 16 MHz; other resolutions may be used by co-adding channels.

Frequency change takes about 5 minutes.

Frequency setting accuracy corresponds to <0.1 km/sec.

Maximum error in velocity determination Is equal to one channel or resolution element, for unresolved lines.





Sensitivity is shown as integrated line flux for 1, 10, and 100 km/s wide resolved emission lines, sufficient to produce S/N = 4 in 900 s for each receiver channel.

MDLF is the "minimum detectable line flux", 4σ in 15 minutes (900 s). For a resolved line, MDLF scales as

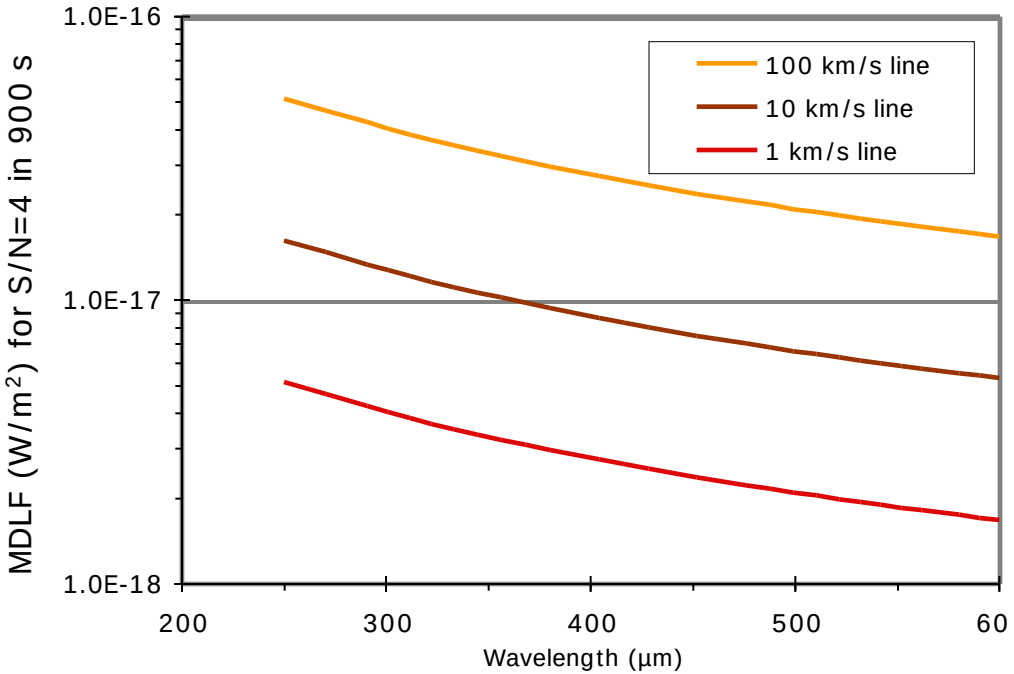
$$\left(\frac{S}{N}\right)\sqrt{\frac{\Delta\nu}{t}}$$

where Δν = line width, and
t = net integration time

Calibration and setup overhead is very roughly 20%.

Estimated system noise temperature includes receiver noise and estimated telescope & sky emission.

Atmospheric transmission may preclude measurements at some wavelengths and reduce sensitivity at others.



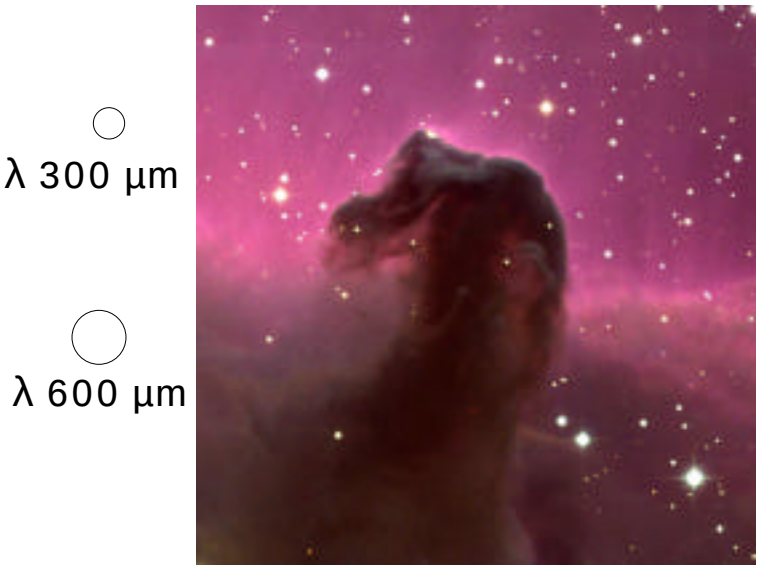
MDLF in brightness temperature units:

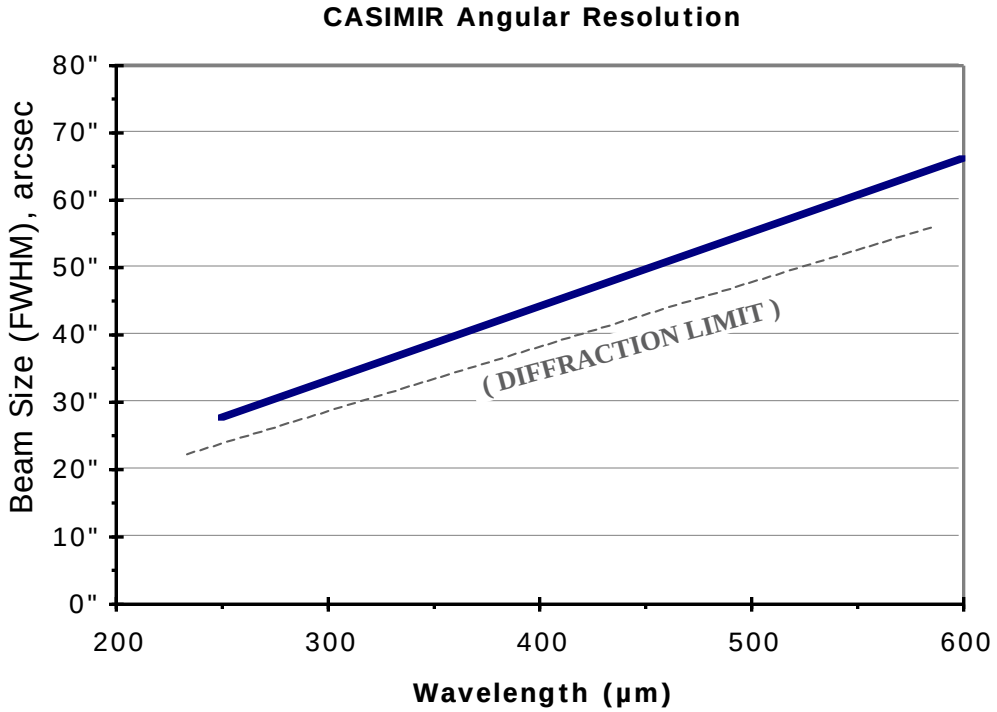
Line width	T_a*	Integrated line flux
100 km/s	0.01 K	0.7 K – km/s
10 km/s	0.02 K	0.2 K – km/s
1 km/s	0.07 K	0.07 K – km/s

CASIMIR Angular Resolution

Beam size shown is the telescope + instrument FWHM size for nominal operating conditions. The beam size excess above telescope diffraction is due to the instrument beam taper, assumed to be 15 dB.

The CASIMIR beam sizes near the short and long wavelength limits are shown below scaled for a visible image of a molecular cloud.





SOFIA and all first light focal-plane instruments are now in development. All sensitivity and resolution data are preliminary, and based on anticipated performance of the observatory and the instruments. Actual performance of the SOFIA telescope and instrument combination will be established after flight operations begin. Telescope performance is expected to be upgraded during the first two years, and instrument performance may be upgraded, or additional modes or capabilities may be added.

PERFORMANCE ESTIMATES GIVEN HERE ARE BASED ON DATA SUPPLIED BY THE INSTRUMENT TEAMS.
A POINT OF CONTACT FOR EACH INSTRUMENT IS PROVIDED.