

MIRI Bright Source Limits

Bright source limits of JWST's [Mid-Infrared Instrument \(MIRI\)](#) are predicted by a saturation model that uses measurements obtained during ground testing.

Introduction

Parent page: [MIRI Predicted Performance](#)

The performance of MIRI has been measured directly at both the component and system level using the fully assembled MIRI flight model in a flight-like radiative environment with a well characterized radiometric source ([Glasse et al. 2015](#)). Results of these JWST throughput measurements have been integrated into a sensitivity model, which includes the following components: (1) background, (2) photon conversion efficiency (PCD), (3) encircled energy, and (4) detector performance ([Pontoppidan 2016](#)).

Users should ultimately use the [Exposure Time Calculator \(ETC\)](#) for all bright limit calculations.

Values

Tables 1 and 2, and Figure 1 show bright source limits assuming a five group integration. The values shown represent the fluxes at which the detector reaches 70% of the pixels' full-well capacity.

Imager

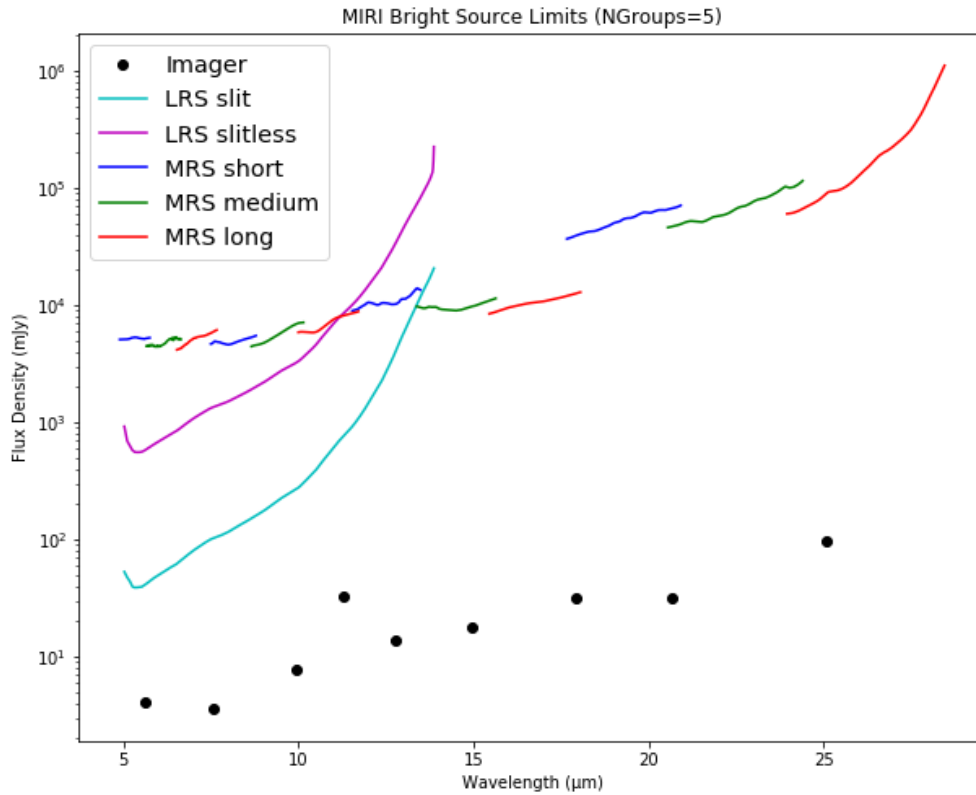
Table 1. MIRI imager bright source limits (for $N_{\text{groups}} = 5$)

Filter	Bright source limit (mJy) full frame	Bright source limit (mJy) 64 × 64 subarray
F560W	4.1	134
F770W	3.6	118
F1000W	7.8	255
F1130W	33	1077
F1280W	13.6	444
F1500W	17.6	575
F1800W	31.7	1035
F2100W	31.8	1038
F2550W	95.3	3112

Table 2. MIRI imager subarray bright source limits (for $N_{\text{groups}} = 5$)

Subarray	Brightness limit in F560W (mJy)	Brightness limit in F2550W (mJy)
<i>FULL</i> ¹	4.1	95
<i>BRIGHTSKY</i>	13	306
<i>SUB256</i>	38	882
<i>SUB128</i>	96	2222
<i>SUB64</i>	134	3111

Figure 1. MIRI bright source limits (for $N_{\text{groups}} = 5$)



MIRI imager bright source limits for all modes, assuming FULL frame.

¹ ***Bold italics*** font style is used to indicate parameters, parameter values, and/or special requirements that are set in the APT GUI.

References

[Glasse, A. et al. 2015, PASP, 127, 686](#)

The Mid-Infrared Instrument for the James Webb Space Telescope, IX: Predicted Sensitivity

[Pontoppidan, K. 2016, Proc of SPIE, 9910, 16](#)

Pandaia: a multi-mission exposure time calculator for JWST and WFIRST

[JWST technical documents](#)