MIRI LRS Dithering

The JWST MIRI low-resolution spectroscopy mode provides dither templates for both point and extended sources.

Dithering for low-resolution spectroscopy

> *Parent pages: MIRI Operations → MIRI Dithering Overview*
> *See also: MIRI LRS Recommended Strategies: Dithering*

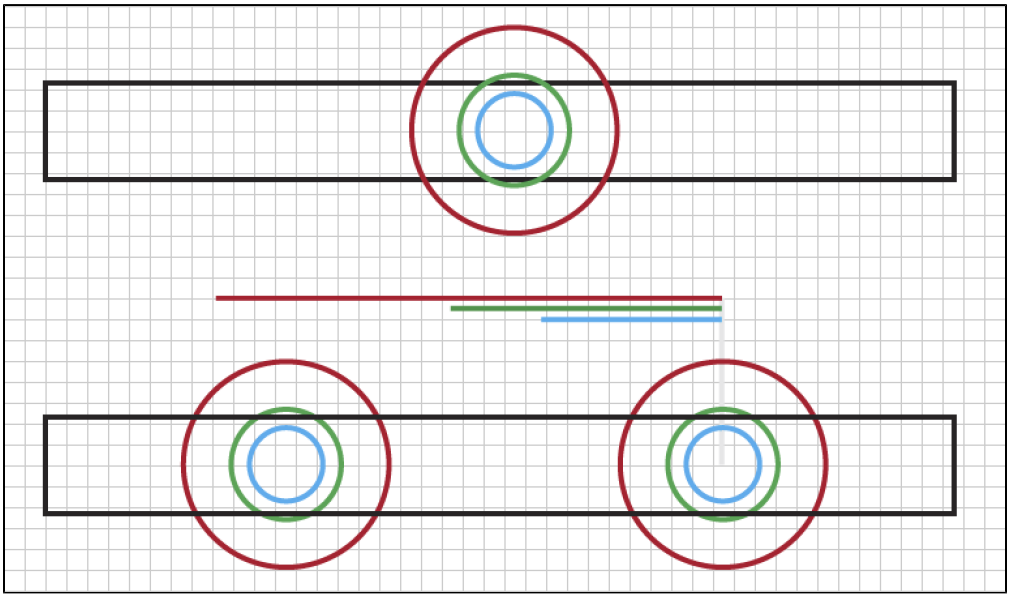
Dithering is possible for MIRI low-resolution spectroscopy (LRS) slit observations only. (It is disabled in the slitless mode). Dithers can mitigate the effects of bad pixels, and obtain subpixel sampling and background observations.

JWST dithering allows for moves specific to MIRI LRS. Dither patterns for observations are implemented in the Astronomer's Proposal Tool (APT) using the JWST APT MIRI LRS template.

Two dither patterns will be offered in this mode:

1. ***ALONG SLIT NOD***[1] is designed for compact sources, and uses a 2-point "nod" where a point source is dithered between positions that are located approximately 30% and 70% of the way along the slit direction.
2. ***MAPPING*** has a customizable number of slit positions and offsets in the slit-parallel and slit-perpendicular directions, allowing users to ensure that a source is well-mapped and that sufficient background data is obtained.

Figure 1. MIRI LRS dither patterns for *MAPPING* and *ALONG SLIT NOD* modes



Top: For the MAPPING dither pattern, the source is centered in the slit and an observer can specify a regular grid of slit positions (including the number of positions and their offsets) from the central pointing.
Bottom: In Along Slit Nod dither pattern, the source is moved between locations at + and -8.25 pixels (~0.9 arcsec) from the slit centre. Blue, green and red circles indicate the first dark Airy ring for 5, 7.7 and 14 µm, respectively. Blue, green and red lines indicate the radius of the 4th dark Airy ring for 5, 7.7 and 14 µm, respectively.

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

References

Gordon , K. et al. 2015, PASP, 127, 953
The Mid-Infrared Instrument for the James Webb Space Telescope, X: Operations and Data Reduction