



# 12566 - CAL-NIS-508: NIRISS Photometry Check of the Temperature Set-point Change

Cycle: 5, Proposal Category: CAL/NIRISS

## INVESTIGATORS

| <i>Name</i>                             | <i>Institution</i>                                    |
|-----------------------------------------|-------------------------------------------------------|
| <b>Dr. Kevin Volk (PI) (CSA Member)</b> | <b>Space Telescope Science Institute - CSA - JWST</b> |
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## OBSERVATIONS

| <i>Folder</i>      | <i>Observation</i> | <i>Label</i>                    | <i>Observing Template</i>   | <i>Science Target</i>      |
|--------------------|--------------------|---------------------------------|-----------------------------|----------------------------|
| Observation Folder |                    |                                 |                             |                            |
|                    | 1                  | Pre-change baseline observation | NIRISS External Calibration | (1) 2MASS-18005751+6846227 |
|                    | 2                  | Post-change observation         | NIRISS External Calibration | (1) 2MASS-18005751+6846227 |

## ABSTRACT

There is a proposal to change the NIRISS detector temperature from the current value of 39 K to 39.8 K, so that the warming of the NIRISS bench does not go outside the range of temperature control with the heater. We propose to make a test of the photometric and linearity response of NIRISS before and after the temperature change using a star observed in the SUBSTRIP256 subarray using the GR700XD grism. This is done in EXTCAL mode because the length of the linearity observation exceeds the APT limit in the normal SOSS mode.

This calibration program may change in response to system developments and the final Cycle 5 science program.

## **OBSERVING DESCRIPTION**

The observation is designed to produce a signal of about 200 ADU/frame in the SUBSTRIP256 subarray and to extend to the full linearity range for a reasonable number of pixels in the subarray to allow detailed linearity analysis. Four integrations are requested to mitigate cosmic ray hits in the ramps. The 2MASS star is selected based on the J-band magnitude, and is not expected to be variable as it is of early G-type. The predicted count rate is uncertain at about the  $\pm 5\%$  level.

The second observation has a requirement of more than 2 days after the first observation simply to avoid issues with smart calibration in getting the time required, since we know that the second observation has to wait for the bench temperature to stabilize after the trim heater adjustment.

# Proposal 12566 - Targets - CAL-NIS-508: NIRISS Photometry Check of the Temperature Set-point Change

| Fixed Targets                                                                                                                                              | #   | Name                   | Target Coordinates                                                                  | Targ. Coord. Corrections                                                                                                | Miscellaneous |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------|
|                                                                                                                                                            | (1) | 2MASS-18005751+6846227 | RA: 18 00 57.5119 (270.2396329d)<br>Dec: +68 46 22.78 (68.77299d)<br>Equinox: J2000 | Proper Motion RA: -2.788 mas/yr<br>Proper Motion Dec: -2.240 mas/yr<br>Parallax: 0.001004"<br>Epoch of Position: 2000.0 |               |
| Comments: This object was generated by the targetselector and retrieved from the 2MASS database.<br>Category=Star<br>Description=[G dwarfs]<br>Extended=NO |     |                        |                                                                                     |                                                                                                                         |               |

# Proposal 12566 - Observation 1 - CAL-NIS-508: NIRISS Photometry Check of the Temperature Set-point Change

|                   |                                                                                                                                                                                                                                      |                        |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    |                              |                 |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|--------------|-----------------|-------------------------------------------------------------------------------------------------------------------------|------------------|--------------------|---------------------|--------------------|------------------------------|-----------------|
| Observation       | Proposal 12566, Observation 1: Pre-change baseline observation                                                                                                                                                                       |                        |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    | Fri May 01 00:00:30 GMT 2026 |                 |
|                   | Diagnostic Status: Warning<br>Observing Template: NIRISS External Calibration                                                                                                                                                        |                        |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    |                              |                 |
| Diagnostics       | (Pre-change baseline observation (Obs 1)) Warning (Form): Observers are responsible for checking that target acquisition is feasible.<br>(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run. |                        |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    |                              |                 |
| Fixed Targets     | #                                                                                                                                                                                                                                    | Name                   | Target Coordinates                                                                  |              |                 | Targ. Coord. Corrections                                                                                                |                  |                    | Miscellaneous       |                    |                              |                 |
|                   | (1)                                                                                                                                                                                                                                  | 2MASS-18005751+6846227 | RA: 18 00 57.5119 (270.2396329d)<br>Dec: +68 46 22.78 (68.77299d)<br>Equinox: J2000 |              |                 | Proper Motion RA: -2.788 mas/yr<br>Proper Motion Dec: -2.240 mas/yr<br>Parallax: 0.001004"<br>Epoch of Position: 2000.0 |                  |                    |                     |                    |                              |                 |
|                   | Comments: This object was generated by the targetselector and retrieved from the 2MASS database.<br>Category=Star<br>Description=[G dwarfs]<br>Extended=NO                                                                           |                        |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    |                              |                 |
| Acquisition       | #                                                                                                                                                                                                                                    | Target                 | Acquisition Mode                                                                    | Filter       | Readout Pattern | Groups/Int                                                                                                              | Integrations/Exp | Total Integrations | Total Exposure Time | Optional ETC ID    |                              |                 |
|                   | 1                                                                                                                                                                                                                                    | SAME                   | SOSSFAINT                                                                           | F480M        | NISRAPID        | 19                                                                                                                      | 1                | 1                  | 0.93                |                    |                              |                 |
| Template          | Pointing Type<br>PRIME                                                                                                                                                                                                               |                        |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    |                              |                 |
| Dithers           | #                                                                                                                                                                                                                                    | Pattern Type           | Image Dithers                                                                       |              |                 | Primary Dithers                                                                                                         |                  | Subpixel Positions |                     | Pattern Size       |                              |                 |
|                   | 1                                                                                                                                                                                                                                    | NONE                   |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    |                              |                 |
| Spectral Elements | #                                                                                                                                                                                                                                    | Subarray               | Aperture                                                                            | Filter Wheel | Pupil Wheel     | Readout Pattern                                                                                                         | Groups/Int       | Integrations/Exp   | Total Dithers       | Total Integrations | Total Exposure Time          | Optional ETC ID |
|                   | 1                                                                                                                                                                                                                                    | SUBSTRIP256            | DEFAULT APERTURE                                                                    | CLEAR        | GR700XD         | NISRAPID                                                                                                                | 180              | 4                  | 1                   | 4                  | 3977.738                     |                 |

# Proposal 12566 - Observation 2 - CAL-NIS-508: NIRISS Photometry Check of the Temperature Set-point Change

|                   |                                                                                                                                                                                                                              |                        |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    |                              |                 |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|--------------|-----------------|-------------------------------------------------------------------------------------------------------------------------|------------------|--------------------|---------------------|--------------------|------------------------------|-----------------|
| Observation       | Proposal 12566, Observation 2: Post-change observation                                                                                                                                                                       |                        |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    | Fri May 01 00:00:30 GMT 2026 |                 |
|                   | Diagnostic Status: Warning<br>Observing Template: NIRISS External Calibration                                                                                                                                                |                        |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    |                              |                 |
| Diagnostics       | (Post-change observation (Obs 2)) Warning (Form): Observers are responsible for checking that target acquisition is feasible.<br>(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run. |                        |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    |                              |                 |
| Fixed Targets     | #                                                                                                                                                                                                                            | Name                   | Target Coordinates                                                                  |              |                 | Targ. Coord. Corrections                                                                                                |                  |                    | Miscellaneous       |                    |                              |                 |
|                   | (1)                                                                                                                                                                                                                          | 2MASS-18005751+6846227 | RA: 18 00 57.5119 (270.2396329d)<br>Dec: +68 46 22.78 (68.77299d)<br>Equinox: J2000 |              |                 | Proper Motion RA: -2.788 mas/yr<br>Proper Motion Dec: -2.240 mas/yr<br>Parallax: 0.001004"<br>Epoch of Position: 2000.0 |                  |                    |                     |                    |                              |                 |
|                   | Comments: This object was generated by the targetselector and retrieved from the 2MASS database.<br>Category=Star<br>Description=[G dwarfs]<br>Extended=NO                                                                   |                        |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    |                              |                 |
| Acquisition       | #                                                                                                                                                                                                                            | Target                 | Acquisition Mode                                                                    | Filter       | Readout Pattern | Groups/Int                                                                                                              | Integrations/Exp | Total Integrations | Total Exposure Time | Optional ETC ID    |                              |                 |
|                   | 1                                                                                                                                                                                                                            | SAME                   | SOSSFAINT                                                                           | F480M        | NISRAPID        | 19                                                                                                                      | 1                | 1                  | 0.93                |                    |                              |                 |
| Template          | Pointing Type                                                                                                                                                                                                                |                        |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    |                              |                 |
|                   | PRIME                                                                                                                                                                                                                        |                        |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    |                              |                 |
| Dithers           | #                                                                                                                                                                                                                            | Pattern Type           | Image Dithers                                                                       |              |                 | Primary Dithers                                                                                                         |                  | Subpixel Positions |                     | Pattern Size       |                              |                 |
|                   | 1                                                                                                                                                                                                                            | NONE                   |                                                                                     |              |                 |                                                                                                                         |                  |                    |                     |                    |                              |                 |
| Spectral Elements | #                                                                                                                                                                                                                            | Subarray               | Aperture                                                                            | Filter Wheel | Pupil Wheel     | Readout Pattern                                                                                                         | Groups/Int       | Integrations/Exp   | Total Dithers       | Total Integrations | Total Exposure Time          | Optional ETC ID |
|                   | 1                                                                                                                                                                                                                            | SUBSTRIP256            | DEFAULT APERTURE                                                                    | CLEAR        | GR700XD         | NISRAPID                                                                                                                | 180              | 4                  | 1                   | 4                  | 3977.738                     |                 |

|                      |                              |
|----------------------|------------------------------|
| Special Requirements | After Date 2026.127:17:50:00 |
|----------------------|------------------------------|