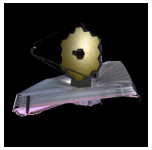

1496 - Wheel Characterization

Cycle: 1, Proposal Category: CAL/NIRSPEC

INVESTIGATORS

Name	***Institution***
Dr. Torsten Boeker (PI) (ESA Member)	**Space Telescope Science Institute - ESA - JWST**
Katie Bechtold (CoI) (CoPI) (Contact)	Space Telescope Science Institute
Maurice te Plate (CoI) (ESA Member) (CoPI) (Contact)	European Space Agency - ESTEC

OBSERVATIONS

Folder	***Observation***	***Label***	***Observing Template***	***Science Target***
Observation Folder				
	1		NIRSpec Filter/Grating Wheel Test	NONE
	2		NIRSpec Filter/Grating Wheel Test	NONE
	3		NIRSpec Filter/Grating Wheel Test	NONE
	4		NIRSpec Filter/Grating Wheel Test	NONE
	5		NIRSpec Filter/Grating Wheel Test	NONE

ABSTRACT

This activity is needed to verify the basic functionality of the FWA and GWA. It will be done once during Cycle 1, unless normal telemetry monitoring indicates a possible problem that requires the more detailed information provided by this characterization activity. The procedure collects NIRSpec-focused telemetry data in the HC buffer at each commanded position and sends them to the ground for inspection after the procedure is completed. The FSW sends a series of mechanism move commands to step the FWA/GWA one position at a time through all 8 wheel positions in both the forward and reverse directions. At each position, the HC buffer is armed before a move and then dumped after the move. The procedure acquires prime internal calibrations and takes approximately 2 hours to execute.

This calibration program is provisional and may change in response to system developments and final science program.

OBSERVING DESCRIPTION

This activity is needed to verify the basic functionality of the FWA and GWA. It will be done once during Cycle 1, unless normal telemetry monitoring indicates a possible problem that requires the more detailed information provided by this characterization activity (there is an identical CAR for each wheel that will be executed in Commissioning if necessary). The procedure collects NIRSpec-focused telemetry data in the HC buffer at each commanded position and sends them to the ground for inspection after the procedure is completed. The FSW sends a series of mechanism move commands to step the FWA/GWA one position at a time through all 8 wheel positions in both the forward and reverse directions. At each position, the HC buffer is armed before a move and then dumped after the move.

TIMING CONSTRAINTS

This program should be run 6-8 months into Cycle 1 in order to have a reasonable time baseline when comparing the wheel behavior to that derived during commissioning. A special requirement has been added to reflect this.

UPDATE (Oct. 28, 2022)

It was decided to run the program earlier than originally planned, so the special requirements have been updated in submission #6

UPDATE (May 17, 2023)

Inserted Obs. 4 (renumbering previous Obs. 4 to Obs. 5) to precede the GWA test with a run-in of the mechanism, as recommended by the mechanism experts.

This will add ca. 20 min to the total duration of Obs. 4+5 (now ca. 80 minutes). Obs 4 could (and maybe should) be scheduled as a slew parallel if possible; OSS has confirmed

it can run as a slew parallel even though the APT template does not allow a PARALLEL SLEW ONLY special requirement.

Proposal 1496 - Observation 1 - Wheel Characterization

Observation

Proposal 1496, Observation 1 Wed May 17 23:00:56 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec Filter/Grating Wheel Test

Comments: the expected duration is ~4min per position, i.e. ~1h for a full rotation of the mechanism in both directions (2 x 8 positions)

Diagnostics

(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Template

Wheel Test Type	Wheel Direction	Mechanism	Number of Rotations
CHARACTERIZE	BOTH	FILTER	

Special Requirements

Between Dates 27-OCT-2022 and 27-DEC-2022
No Parallel Attachments

Proposal 1496 - Observation 2 - Wheel Characterization

Observation

Proposal 1496, Observation 2 Wed May 17 23:00:56 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec Filter/Grating Wheel Test

Comments: the expected duration is ~4min per position, i.e. ~1h for a full rotation of the mechanism in both directions (2 x 8 positions)

Diagnostics

(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Template

Wheel Test Type	Wheel Direction	Mechanism	Number of Rotations
CHARACTERIZE	BOTH	GRATING	

Special Requirements

Between Dates 27-OCT-2022 and 27-DEC-2022
No Parallel Attachments

Proposal 1496 - Observation 3 - Wheel Characterization

Observation

Proposal 1496, Observation 3 Wed May 17 23:00:56 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec Filter/Grating Wheel Test

Comments: the expected duration is ~4min per position, i.e. ~1h for a full rotation of the mechanism in both directions (2 x 8 positions)

Diagnostics

(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Template

Wheel Test Type	Wheel Direction	Mechanism	Number of Rotations
CHARACTERIZE	BOTH	GRATING	

Special Requirements

Between Dates 25-MAR-2023 and 15-MAY-2023:00:00:00
No Parallel Attachments

Proposal 1496 - Observation 4 - Wheel Characterization

Observation

Proposal 1496, Observation 4 Wed May 17 23:00:56 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec Filter/Grating Wheel Test

Comments: the run-in procedure (with 2 full rotations per direction) is expected to take ca. 20 minutes

Diagnostics

(Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Template

Wheel Test Type	Wheel Direction	Mechanism	Number of Rotations
RUNIN	BOTH	GRATING	2

Special Requirements

Between Dates 05-JUN-2023:00:00:00 and 05-JUL-2023:00:00:00
No Parallel Attachments

5 After 4 by <None specified> to 2 Days, Exclusive Use Of Instrument

Proposal 1496 - Observation 5 - Wheel Characterization

Observation

Proposal 1496, Observation 5 Wed May 17 23:00:56 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec Filter/Grating Wheel Test

Comments: the expected duration (incl. slew and all overheads) is ~1h for two full rotations of the mechanism (one in each direction, i.e 2x8 positions)

Diagnostics

(Visit 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Template

Wheel Test Type	Wheel Direction	Mechanism	Number of Rotations
CHARACTERIZE	BOTH	GRATING	

Special Requirements

No Parallel Attachments

5 After 4 by <None specified> to 2 Days, Exclusive Use Of Instrument