16780 - Time Domain Coronagraphy: Diagnosing the Stripping of AU Mic's Debris Disk

Cycle: 29, Proposal Category: GO

(Availability Mode: AVAILABLE)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) V-AU-MIC	STIS/CCD	1	10-Nov-2021 07:00:16.0	yes
02	(1) V-AU-MIC	STIS/CCD	1	10-Nov-2021 07:00:17.0	yes
03	(1) V-AU-MIC	STIS/CCD	1	10-Nov-2021 07:00:18.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
05	(1) V-AU-MIC	STIS/CCD	1	10-Nov-2021 07:00:21.0	yes
06	(1) V-AU-MIC	STIS/CCD	1	10-Nov-2021 07:00:23.0	yes
07	(2) PSFSTAR-HD-191849	STIS/CCD	1	10-Nov-2021 07:00:26.0	yes
08	(1) V-AU-MIC	STIS/CCD	1	10-Nov-2021 07:00:30.0	yes

7 Total Orbits Used

ABSTRACT

Boccaletti+ (2015) discovered features moving within the AU Mic debris disk at super-Keplerian tangential velocities in spatially resolved imagery of the AU Mic debris disk. To date, these are the only moving structures seen in spatially resolved imagery of debris disks. The surface brightness, number, morphology, and velocities of these moving features constrains their physical location and mass, and thus are critical quantities needed to constrain the origin of this phenomenon. We propose 7 orbits of HST/STIS time per cycle, for cycles 27,28,29, to determine: a) What is the surface brightness of all features, and how does the surface brightness and morphology of features change over time?; b) What is the detailed vertical motion of features, and does the amplitude of this motion depend on stellocentric separation?; and c) What is the motion of the newly found features (NW-gamma and NW-delta) on the NW-side of the disk? These data will be used to test hypotheses that predict features are caused by the stellar wind expelling grains originating from a parent body that orbits at 8+/-2 au (Sezestre+ 2017) or by interaction between the star's wind and repeated dust avalanche events (Chiang & Fung 2017).

OBSERVING DESCRIPTION

OVERALL PROGRAM

This program will obtain two sets of visits of observations of AU Mic. The first set of 5 visits utilize Wedge A0.6 and Wedge A1.0 observations. All visits during this set MUST be executed in contiguous orbits. The second set of 5 visits utilize BAR5 observations. All visits during this set MUST be executed in contiguous orbits.

VISITS AND EXPOSURE DETAILS

1) WEDGE-A OBSERVATION SET

Guide Star Acquisitions: We require pointing and roll control with 2-FGS guiding. Single-FGS guiding does not offer sufficient target position stability for coronagraphy.

Each visit (after its Guide Star acquisition) begins with a mode-2 target acquisition, is followed by a sequence of repetitive "short" exposures (by CR-SPLIT or exposure replication) at the WedgeA0.6 position followed by a sequence of repetitive "long" exposures (also by CR-SPLIT or exposure replication) at the Wedge A1.0 position.

1) Target Acquisitions. We expose our TA images to a SNR > appx 100 using the STIS ETC. While robust target acquisition is enabled with SNR 40, we also use the TA images as a pre mode-2 astrometric anchor to assess the "behind the wedge" target position to high precision (separate from "diffraction spike" analysis, for which higher SNR for precision centroiding is required. We also use these F25ND3 filtered imagesto photometrically obtain target:PSF template brightness ratios in the broad STIS passband. The STIS Target Acquisition ETC was used to determine the eposure times for all acquisition images.

2) The "short" exposure times are designed to reach 90% of full-well depth, with the target coronagraphically occulted, at the edge of the wedge 0.3" from the star. We scale, using the ETC, this from observations predicated upon an A0 star with V = 3.55 reach 90% full well from the PSF halo in 1 second based upon preious STIS coronagraphic observations allowing for up to as much of 1/2 pixel of possible target decentering in acquisition performance. We generally repeat these exposures to fill appx 35% of the target visibility interval after subtracting the time required for the preceding guide star and target acquisitions.

3) Following the short exposures we execute a Type-2 slew (by a change in instrument aperture to Wedge1.0) for the "long" exposure imaging.

Sub-Array Readouts. For most coronagraphic exposures we use subarray readouts (SIZEAXIS2) symmetrically centered on the target to fully read-out the region along the wedge (Axis2, image Y axis) to the edge of the FOV at the small end of the wedge taper, and symmetrically on the diametrically opposing side. For WedgeA1.0 the max SIZEAXIS2 (without displacing with an |unsupported| CENTERAXIS2) is 427 pixels. This implies that the A1.0 position is 10.82 from the edge of the FOV (whole sub-array centered on target symmetrically 21.65 along the wedge). For WedgeA0.6 is (without displacing with an |unsupported| CENTERAXIS2) is 137 pixels. This implies that the A0.6 position is 3.47 from the edge of the FOV (whole sub-array centered on target symmetrically 6.95 along the wedge).

VISIT LINKAGES (RELATIVE ORIENTATION CONSTRAINTS AND INTERLEAVED PSF OBSERVATIONS)
==========

We place an absolute orient request on VISIT 3 that constrain the AU Mic disk to align perpendicular to the long axis of occulting Wedge A. We place relative orient constraints on VISIT 1 (-30 to -20 degrees from VISIT 3) and on VISIT 5 (20 to 30 degrees from VISIT 3). No relative orient constraints are placed on VISIT 2 or VISIT 4.

We require all 5 visits within this observational be executed in contiguous orbits.

2) BAR5 OBSERVATION SET

Guide Star Acquisitions: We require pointing and roll control with 2-FGS guiding. Single-FGS guiding does not offer sufficient target position stability for coronagraphy.

Each visit (after its Guide Star acquisition) begins with a mode-2 target acquisition, is followed by a sequence of repetitive "short" exposures (by CR-SPLIT or exposure replication) at the nominal BAR5 position. To mitigate against target centering uncertainties behind BAR5, we also include one sequence of repetitive exposures with the target offset by 0.25 pixels ABOVE the nominal center of BAR5 and one sequence of repetitive exposures with the target offset by 0.25 pixels BELOW the nominal center of BAR5 (i.e. an effective dither about the center position of BAR5).

We achieve this dither pattern by using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = + 0.0024921 arcsec and y = + 0.0122491 for the PLUSDITHER position, and x = - 0.0024921 arcsec and y = - 0.0122491 for the MINUSDITHER position).

1) Target Acquisitions. We expose our TA images to a SNR > appx 100 using the STIS ETC. While robust target acquisition is enabled with SNR

40, we also use the TA images as a pre mode-2 astrometric anchor to assess the "behind the wedge" target position to high precision (separate from "diffraction spike" analysis, for which higher SNR for precision centroiding is required. We also use these F25ND3 filtered imagesto photometrically obtain target:PSF template brightness ratios in the broad STIS passband. The STIS Target Acquisition ETC was used to determine the eposure times for all acquisition images.

VISIT LINKAGES (RELATIVE ORIENTATION CONSTRAINTS AND INTERLEAVED PSF OBSERVATIONS)
==========

We place an absolute orient request on VISIT 23 that constrains the AU Mic disk to align perpendicular to the long axis of occulting BAR5. We place relative orient constraints on VISIT 23 (-30 to -20 degrees from VISIT 23) and on VISIT 25 (20 to 30 degrees from VISIT 3). No relative orient constraints are placed on VISIT 21 or VISIT 24.

We require all 5 visits within this observational be executed in contiguous orbits.

-------- Realtime Justification --------

We have no real-time requirments.

------ Calibration Justification -------

We ask for no SPECIAL calibrations for this proposal (and called none out in Phase 1). We did not because we ASSUME that STScI will acquire GAIN=4 (supported mode) bias, DARK, and flat-field frames (and derived hot/bad pixel maps) as part of their Cycle 25 calibration plan in support of

approved Cycle 25 science programs. If this is NOT the case then we must obtain GAIN=4 calibration reference bias/dark data as part of our program using NON-POINTED (internal) orbits only. If STScI does not include acquiring for broader purposes the reference data we need, then we will need to add those internal calibrations to this program AFTER the Phase 2 deadline.

Visit

Proposal 16780, Visit 01, completed Wed Nov 10 12:00:31 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; ORIENT -30D TO -19D FROM 02

Comments: AU MIC (V=8.61, B-V = + 1.45).

This set of visits (1-3) uses WedgeA. These visits (1-3) MUST be executed sequentially in contiguous orbits interrupted only for Earth occultation.

Orientation: We have set the allowable orientation to range from -30 deg to -19 degrees from Visit 2, to allow a sufficiently large scheduling window. NOTE TO PC: Our science is optimized if we can achieve an orient as close as possible to -30 degrees from the preferred absolute orient of 83.7 degrees in Visit 2. We ask that you please try to identify scheduling windows that enable us to get as close as possible to this orientation. IF the absolute orient of Visit 2 deviates from 83.7 degrees, PLEASE ask us for guidance as to the orientation range we prefer for Visit 1. We absolutely do NOT want the disk major axis (128.7 degrees) to align with the STIS diffration spikes in Visits 1, 2, or 3.

Diagnostics

(Visit 01) Warning (Orbit Planner): STIS EXPOSURE TIME ROUNDED DOWN TO NEAREST 0.1 SECONDS
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(Visit 01) Warning (Orbit Planner): SUBARRAY OFF OF DETECTOR
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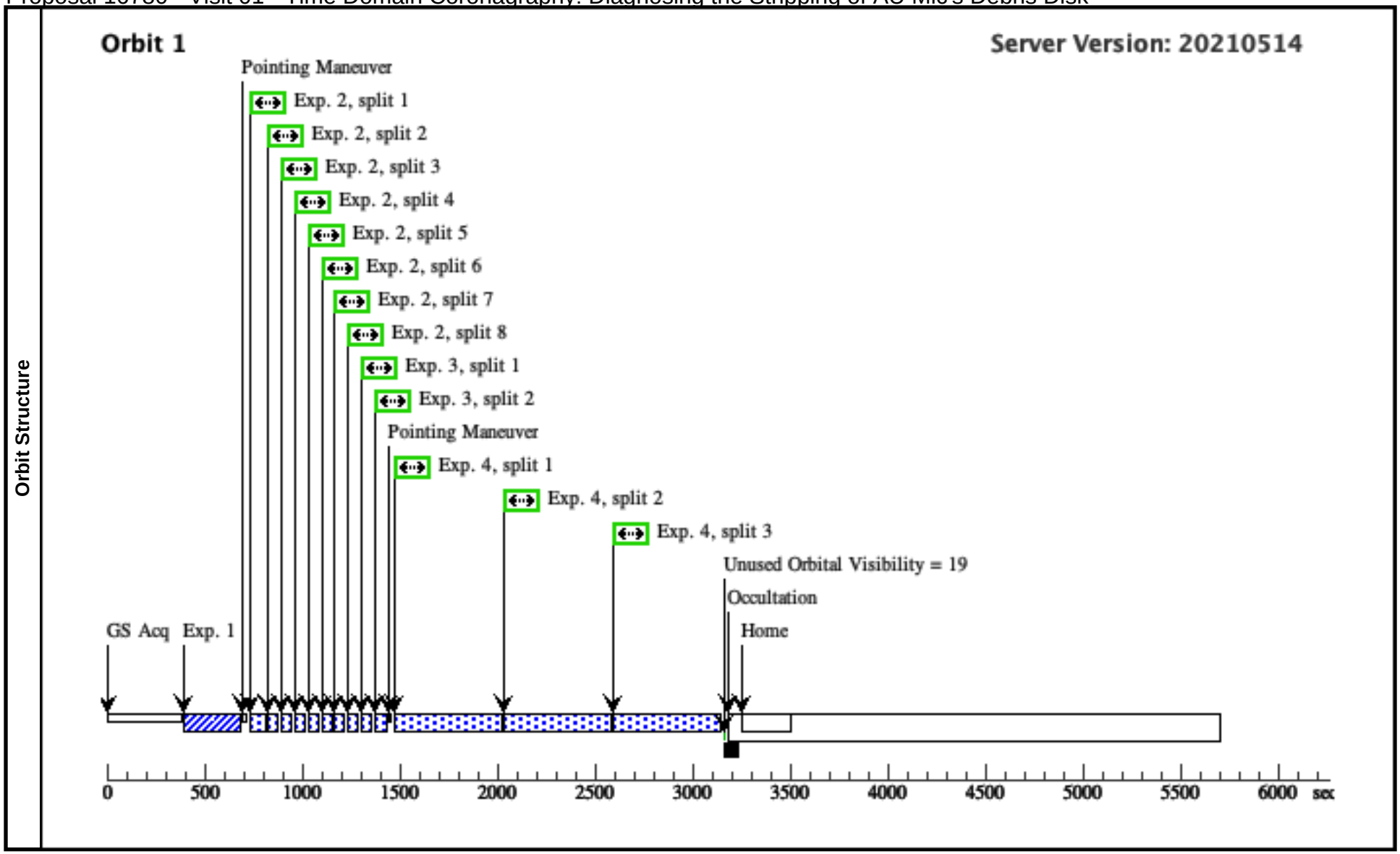
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	V-AU-MIC	RA: 20 45 9.5323 (311.2897179d) Dec: -31 20 27.23 (-31.34090d) Equinox: J2000	Proper Motion RA: 281.424 mas/yr Proper Motion Dec: -359.895 mas/yr Parallax: 0.1028295" Epoch of Position: 2000.0	V=8.627	Reference Frame: ICRS

Comments: Coordinates are from GSC2.3.2.
Category=STAR
Description=[CIRCUMSTELLAR MATTER, M V-IV]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	AUMIC-ACQ	(1) V-AU-MIC	STIS/CCD, ACQ, F25ND3	MIRROR			Sequence 1-4 Non-Int in Visit 01	0.40 Secs (0.4 Secs)	
								[==>]	***[1]***
	Comments: SNR = 100, V = 8.61, sp = M1Ve, Exptime rounded to nearest 0.1 second								
2	AUMIC_SHORTS_1	(1) V-AU-MIC	STIS/CCD, ACCUM, WEDGEA0.6	MIRROR	SIZEAXIS2=137; CR-SPLIT=8; GAIN=4		Sequence 1-4 Non-Int in Visit 01	364 Secs (364 Secs)	
								[==>(Split 1)] *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	***[1]***
	Comments: SCALABLE BENCHMARK: We expect full-well at r=0.3" from wings of stellar PSF in 1 second for V=3.55. *AU MIC is V = 8.61 so saturation in 50.6s. So 90% full well in appx 45.5s. Use this for the "short" exposures, repeated (8x) with multiple CR Splits. This setup for the "short" exposures replicates the setup used for GO-12228 for this target and WEDGE observations.* *SCALABLE PARAMETER FOR SUB-ARRAY Readout: SIZEAXIS2 = 20 is 1" in full extent (r = 0.5")* *For these "short" exposures we will image perpendicular to the wedge (symmetrically) centered on the target to the maximum extent permitted by the limits of the FOV (edge of the detector) on the "small" side of the Wedge A taper. Thus, for these short exposures we use SIZEAXIS12 = 137, appropriate for the WedgeA0.6 position.*								
3	AUMIC_SHORTS_2	(1) V-AU-MIC	STIS/CCD, ACCUM, WEDGEA0.6	MIRROR	SIZEAXIS2=137; CR-SPLIT=2; GAIN=4		Sequence 1-4 Non-Int in Visit 01	91 Secs (91 Secs)	
								[==>(Split 1)] *[==>(Split 2)]*	***[1]***
	Comments: SCALABLE BENCHMARK: We expect full-well at r=0.3" from wings of stellar PSF in 1 second for V=3.55. *AU MIC is V = 8.61 so saturation in 50.6s. So 90% full well in appx 45.5s. Use this for the "short" exposures, repeated with multiple CR Splits. This setup for the "short" exposures replicates the setup used for GO-12228 for this target and WEDGE observations.* *SCALABLE PARAMETER FOR SUB-ARRAY Readout: SIZEAXIS2 = 20 is 1" in full extent (r = 0.5")* *For these "short" exposures we will image perpendicular to the wedge (symmetrically) centered on the target to the maximum extent permitted by the limits of the FOV (edge of the detector) on the "small" side of the Wedge A taper. Thus, for these short exposures we use SIZEAXIS12 = 137, appropriate for the WedgeA0.6 position.*								
4	AUMIC_LONG	(1) V-AU-MIC	STIS/CCD, ACCUM, WEDGEA1.0	MIRROR	SIZEAXIS2=427; CR-SPLIT=3; GAIN=4		Sequence 1-4 Non-Int in Visit 01	1592 Secs (1592 Secs)	
								[==>(Split 1)] *[==>(Split 2)]* *[==>(Split 3)]*	***[1]***
	Comments: SCALABLE BENCHMARK: We expect full-well at r=0.3" from wings of stellar PSF in 1 second for V=3.55. *AU MIC is V = 8.61 so saturation in 50.6s.* *So 90% full well in appx 45.5s. For long exposures at WedgeA1.0 go > 10x deeper in each that will fit into remainer ofvisibility period CR-SPLIT at least 3 times - and trim exposure time to fit in visibility window. Th is setup for the "long" exposures replicates the setup used for GO-12228 for this target and WEDGE observations.* *SCALABLE PARAMETER FOR SUB-ARRAY Readout: SIZEAXIS2 = 20 is 1" in full extent (r = 0.5")* *For these "long" exposures we will image perpendicular to the wedge (symmetrically) centered on the target to the maximum extent permitted by the limits of the FOV (edge of the detector) on the "small" side of the Wedge A taper. Thus, for these short exposures we use SIZEAXIS12 = 427, appropriate for the WedgeA1.0 position.*								


Orbit Structure
Orbit 1
Server Version: 20210514
Pointing Maneuver
Exp. 2, split 1
Exp. 2, split 2
Exp. 2, split 3
Exp. 2, split 4
Exp. 2, split 5
Exp. 2, split 6
Exp. 2, split 7
Exp. 2, split 8
Exp. 3, split 1
Exp. 3, split 2
Pointing Maneuver
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Unused Orbital Visibility = 19
Occultation
GS Acq
Exp. 1
Home
0
500
1000
1500
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2500
3000
3500
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4500
5000
5500
6000
sec

Visit

Proposal 16780, Visit 02, completed Wed Nov 10 12:00:31 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; ORIENT 72.8D TO 93.7 D; AFTER 01 BY 0.5 Orbits TO 1.2 Orbits

Comments: AU MIC (V=8.61, B-V = + 1.45).

This set of visits (1-3) uses WedgeA. These visits (1-3) MUST be executed sequentally in contiguous orbits interrupted only for Earth occultation.

Orientation: We have set the allowable absolute orientation to range from 73.7 deg to 93.7 degrees, to allow a sufficiently large scheduling window. NOTE TO PC: AU Mic's disk has a PA of 128.7 degrees. Our science is optimized if we can achieve an absolute orient that places the major axis of AU Mic's disk perpendicular to the long axis of WEDGEA. We need our absolute orient to be as close as possible to (128.7 degrees + 315 degrees = 83.7 degrees; or equivalently ok 128.7 degrees + 135 degrees = 263.7 degrees). We ask that you please try to identify scheduling windows that enable us to get as close as possible to either of these absolute orientations. These orientiations place the circumstellar disk axis perpendicular to the long-axis of WEDGEA. We have allowed a +/-10 degree window about this strong preference to aid scheduled and GS acquisition.

Relative Timing: This visit (2) MUST immediately follow Visit 1 and immediately preceed Visit 3 in back-to-back orbits.

Diagnostics

(Visit 02) Warning (Orbit Planner): STIS EXPOSURE TIME ROUNDED DOWN TO NEAREST 0.1 SECONDS
(Visit 02) Warning (Orbit Planner): STIS EXPOSURE TIME ROUNDED DOWN TO NEAREST 0.1 SECONDS
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Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
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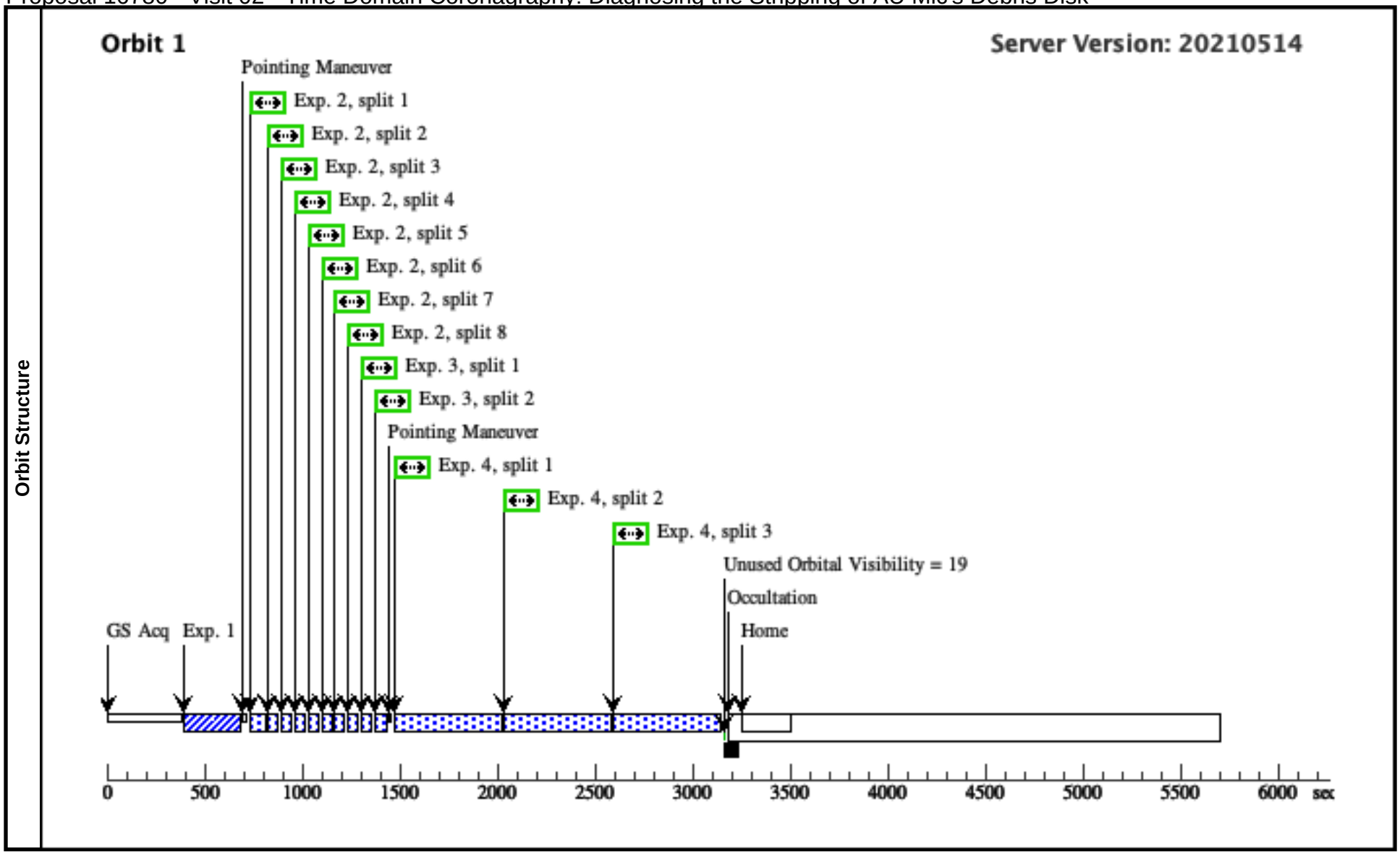
Comments: Coordinates are from GSC2.3.2.
Category=STAR
Description=[CIRCUMSTELLAR MATTER, M V-IV]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	AUMIC-ACQ	(1) V-AU-MIC	STIS/CCD, ACQ, F25ND3	MIRROR			Sequence 1-4 Non-Int in Visit 02	0.40 Secs (0.4 Secs) *[==>]*	 ***[1]***
Comments: SNR = 100, V = 8.61, sp = M1Ve, Exptime rounded to nearest 0.1 second									
2	AUMIC_SHORTS_1	(1) V-AU-MIC	STIS/CCD, ACCUM, WEDGEA0.6	MIRROR	SIZEAXIS2=137; CR-SPLIT=8; GAIN=4		Sequence 1-4 Non-Int in Visit 02	364 Secs (364 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	 ***[1]***
Comments: SCALABLE BENCHMARK: We expect full-well at r=0.3" from wings of stellar PSF in 1 second for V=3.55. AU MIC is V = 8.61 so saturation in 50.6s. So 90% full well in appx 45.5s. Use this for the "short" exposures, repeated (8x) with multiple CR Splits. This setup for the "short" exposures replicates the setup used for GO-12228 for this target and WEDGE observations. *SCALABLE PARAMETER FOR SUB-ARRAY Readout: SIZEAXIS2 = 20 is 1" in full extent (r = 0.5") For these "short" exposures we will image perpendicular to the wedge (symmetrically) centered on the target to the maximum extent permitted by the limits of the FOV (edge of the detector) on the "small" side of the Wedge A taper. Thus, for these short exposures we use SIZEAXIS12 = 137, appropriate for the WedgeA0.6 position.*								
3	AUMIC_SHORTS_2	(1) V-AU-MIC	STIS/CCD, ACCUM, WEDGEA0.6	MIRROR	SIZEAXIS2=137; CR-SPLIT=2; GAIN=4		Sequence 1-4 Non-Int in Visit 02	91 Secs (91 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***
Comments: SCALABLE BENCHMARK: We expect full-well at r=0.3" from wings of stellar PSF in 1 second for V=3.55. AU MIC is V = 8.61 so saturation in 50.6s. So 90% full well in appx 45.5s. Use this for the "short" exposures, repeated with multiple CR Splits. This setup for the "short" exposures replicates the setup used for GO-12228 for this target and WEDGE observations. *SCALABLE PARAMETER FOR SUB-ARRAY Readout: SIZEAXIS2 = 20 is 1" in full extent (r = 0.5") For these "short" exposures we will image perpendicular to the wedge (symmetrically) centered on the target to the maximum extent permitted by the limits of the FOV (edge of the detector) on the "small" side of the Wedge A taper. Thus, for these short exposures we use SIZEAXIS12 = 137, appropriate for the WedgeA0.6 position.*								
4	AUMIC_LONG	(1) V-AU-MIC	STIS/CCD, ACCUM, WEDGEA1.0	MIRROR	SIZEAXIS2=427; CR-SPLIT=3; GAIN=4		Sequence 1-4 Non-Int in Visit 02	1592 Secs (1592 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	 ***[1]***
Comments: SCALABLE BENCHMARK: We expect full-well at r=0.3" from wings of stellar PSF in 1 second for V=3.55. AU MIC is V = 8.61 so saturation in 50.6s. So 90% full well in appx 45.5s. For long exposures at WedgeA1.0 go > 10x deeper in each that will fit into remainer of visibility period CR-SPLIT at least 3 times - and trim exposure time to fit in visibility window. This setup for the "long" exposures replicates the setup used for GO-12228 for this target and WEDGE observations. *SCALABLE PARAMETER FOR SUB-ARRAY Readout: SIZEAXIS2 = 20 is 1" in full extent (r = 0.5") For these "long" exposures we will image perpendicular to the wedge (symmetrically) centered on the target to the maximum extent permitted by the limits of the FOV (edge of the detector) on the "small" side of the Wedge A taper. Thus, for these short exposures we use SIZEAXIS12 = 427, appropriate for the WedgeA1.0 position.*								


Orbit 1
Server Version: 20210514
Orbit Structure
Pointing Maneuver
Exp. 2, split 1
Exp. 2, split 2
Exp. 2, split 3
Exp. 2, split 4
Exp. 2, split 5
Exp. 2, split 6
Exp. 2, split 7
Exp. 2, split 8
Exp. 3, split 1
Exp. 3, split 2
Pointing Maneuver
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Unused Orbital Visibility = 19
Occultation
Home
GS Acq
Exp. 1
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16780, Visit 03, completed Wed Nov 10 12:00:31 GMT 2021

Diagnostic Status: Warning

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; ORIENT 19D TO 30D FROM 02; AFTER 02 BY 0.5 Orbits TO 1.2 Orbits

Comments: AU MIC (V=8.61, B-V = + 1.45).

This set of visits (1-3) uses WedgeA. These visits (1-3) MUST be executed sequentally in contiguous orbits interrupted only for Earth occultation.

Orientation: We have set the allowable orientation to range from 19 deg to 30 degrees from Visit 2, to allow a sufficiently large scheduling window. NOTE TO PC: Our science is optimized if we can achieve an orient as close as possible to +30 degrees from the preferred absolute orient of 83.7 degrees in Visit 2. We ask that you please try to identify scheduling windows that enable us to get as close as possible to this orientation. IF the absolute orient of Visit 2 deviates from 83.7 degrees, PLEASE ask us for guidance as to the orientation range we prefer for Visit 3. We absolutely do NOT want the disk major axis (128.7 degrees) to align with the STIS diffration spikes in Visits 1, 2, or 3.

Relative Timing: This visit (3) MUST immediately follow Visit 2. I.e., They should be executed sequentially in "back-to-back" orbits.

Diagnostics

(Visit 03) Warning (Orbit Planner): STIS EXPOSURE TIME ROUNDED DOWN TO NEAREST 0.1 SECONDS
(Visit 03) Warning (Orbit Planner): STIS EXPOSURE TIME ROUNDED DOWN TO NEAREST 0.1 SECONDS
(Visit 03) Warning (Orbit Planner): STIS EXPOSURE TIME ROUNDED DOWN TO NEAREST 0.1 SECONDS
(Visit 03) Warning (Orbit Planner): SUBARRAY OFF OF DETECTOR
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(Visit 03) Warning (Orbit Planner): SUBARRAY OFF OF DETECTOR
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(Visit 03) Warning (Orbit Planner): SUBARRAY OFF OF DETECTOR

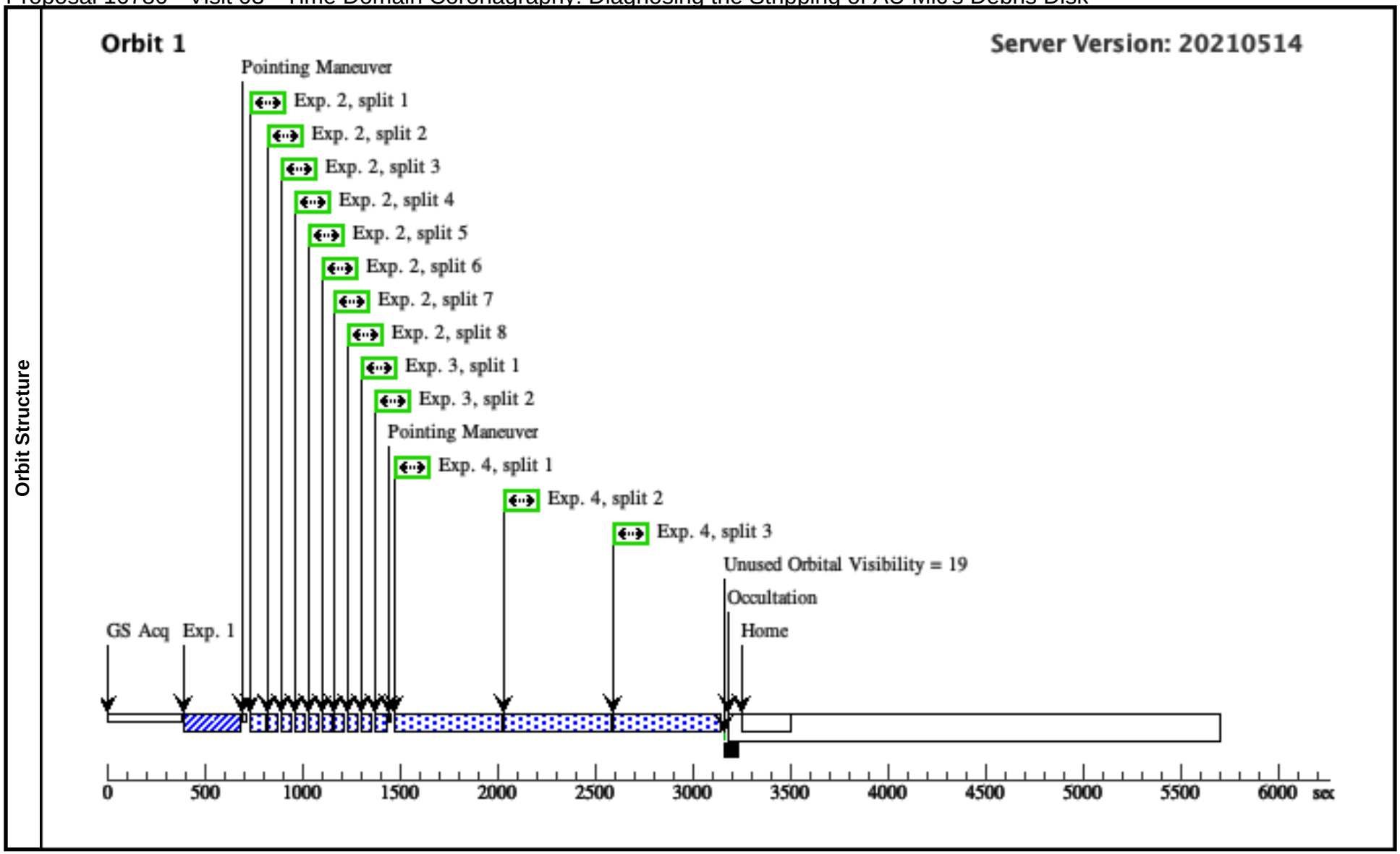
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	V-AU-MIC	RA: 20 45 9.5323 (311.2897179d) Dec: -31 20 27.23 (-31.34090d) Equinox: J2000	Proper Motion RA: 281.424 mas/yr Proper Motion Dec: -359.895 mas/yr Parallax: 0.1028295" Epoch of Position: 2000.0	V=8.627	Reference Frame: ICRS

Comments: Coordinates are from GSC2.3.2.
Category=STAR
Description=[CIRCUMSTELLAR MATTER, M V-IV]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	AUMIC-ACQ	(1) V-AU-MIC	STIS/CCD, ACQ, F25ND3	MIRROR			Sequence 1-4 Non-Int in Visit 03	0.4 Secs (0.4 Secs) *[==>]*	 ***[1]***
Comments: SNR = 100, V = 8.61, sp = M1Ve, Exptime rounded to nearest 0.1 second									
2	AUMIC_SHORTS_1	(1) V-AU-MIC	STIS/CCD, ACCUM, WEDGEA0.6	MIRROR	SIZEAXIS2=137; CR-SPLIT=8; GAIN=4		Sequence 1-4 Non-Int in Visit 03	364 Secs (364 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	 ***[1]***
Comments: SCALABLE BENCHMARK: We expect full-well at r=0.3" from wings of stellar PSF in 1 second for V=3.55. AU MIC is V = 8.61 so saturation in 50.6s. So 90% full well in appx 45.5s. Use this for the "short" exposures, repeated (8x) with multiple CR Splits. This setup for the "short" exposures replicates the setup used for GO-12228 for this target and WEDGE observations. SCALABLE PARAMETER FOR SUB-ARRAY Readout: SIZEAXIS2 = 20 is 1" in full extent (r = 0.5") For these "short" exposures we will image perpendicular to the wedge (symmetrically) centered on the target to the maximum extent permitted by the limits of the FOV (edge of the detector) on the "small" side of the Wedge A taper. Thus, for these short exposures we use SIZEAXIS12 = 137, appropriate for the WedgeA0.6 position.								
3	AUMIC_SHORTS_2	(1) V-AU-MIC	STIS/CCD, ACCUM, WEDGEA0.6	MIRROR	SIZEAXIS2=137; CR-SPLIT=2; GAIN=4		Sequence 1-4 Non-Int in Visit 03	91 Secs (91 Secs) *[==>(Split 1)]* *[==>(Split 2)]*	 ***[1]***
Comments: SCALABLE BENCHMARK: We expect full-well at r=0.3" from wings of stellar PSF in 1 second for V=3.55. AU MIC is V = 8.61 so saturation in 50.6s. So 90% full well in appx 45.5s. Use this for the "short" exposures, repeated with multiple CR Splits. This setup for the "short" exposures replicates the setup used for GO-12228 for this target and WEDGE observations. SCALABLE PARAMETER FOR SUB-ARRAY Readout: SIZEAXIS2 = 20 is 1" in full extent (r = 0.5") For these "short" exposures we will image perpendicular to the wedge (symmetrically) centered on the target to the maximum extent permitted by the limits of the FOV (edge of the detector) on the "small" side of the Wedge A taper. Thus, for these short exposures we use SIZEAXIS12 = 137, appropriate for the WedgeA0.6 position.								
4	AUMIC_LONG	(1) V-AU-MIC	STIS/CCD, ACCUM, WEDGEA1.0	MIRROR	SIZEAXIS2=427; CR-SPLIT=3; GAIN=4		Sequence 1-4 Non-Int in Visit 03	1592 Secs (1592 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	 ***[1]***
Comments: SCALABLE BENCHMARK: We expect full-well at r=0.3" from wings of stellar PSF in 1 second for V=3.55. AU MIC is V = 8.61 so saturation in 50.6s. So 90% full well in appx 45.5s. For long exposures at WedgeA1.0 go > 10x deeper in each that will fit into remainer of visibility period CR-SPLIT at least 3 times - and trim exposure time to fit in visibility window. This setup for the "long" exposures replicates the setup used for GO-12228 for this target and WEDGE observations. SCALABLE PARAMETER FOR SUB-ARRAY Readout: SIZEAXIS2 = 20 is 1" in full extent (r = 0.5") For these "long" exposures we will image perpendicular to the wedge (symmetrically) centered on the target to the maximum extent permitted by the limits of the FOV (edge of the detector) on the "small" side of the Wedge A taper. Thus, for these short exposures we use SIZEAXIS12 = 427, appropriate for the WedgeA1.0 position.								


Orbit Structure
Orbit 1
Server Version: 20210514
Pointing Maneuver
Exp. 2, split 1
Exp. 2, split 2
Exp. 2, split 3
Exp. 2, split 4
Exp. 2, split 5
Exp. 2, split 6
Exp. 2, split 7
Exp. 2, split 8
Exp. 3, split 1
Exp. 3, split 2
Pointing Maneuver
Exp. 4, split 1
Exp. 4, split 2
Exp. 4, split 3
Unused Orbital Visibility = 19
Occultation
GS Acq
Exp. 1
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16780, Visit 05, implementation Wed Nov 10 12:00:31 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; ORIENT -6.5D TO -6.5D FROM 06

Comments: AU MIC (V=8.61, B-V = + 1.45).

This set of visits (5-8) uses BAR5. These visits (5-8) MUST be executed sequentially in contiguous orbits interrupted only for Earth occultation.

Orientation: We have set the allowable orientation to range from -6.5 deg to -6.5 degrees from Visit 6, to allow a sufficiently large scheduling window. NOTE TO PC: Our science is optimized if we can achieve an orient as close as possible to -6.5 degrees from the preferred absolute orient of 353.7 degrees in Visit 6. We ask that you please try to identify scheduling windows that enable us to get as close as possible to this orientation. IF the absolute orient of Visit 6 deviates from 353.7 degrees, PLEASE ask us for guidance as to the orientation range we prefer for Visit 5. We absolutely do NOT want the disk major axis (128.7 degrees) to align with the STIS diffration spikes in Visits 5,6, or 8.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	V-AU-MIC	RA: 20 45 9.5323 (311.2897179d)	Proper Motion RA: 281.424 mas/yr	V=8.627	Reference Frame: ICRS
		Dec: -31 20 27.23 (-31.34090d)	Proper Motion Dec: -359.895 mas/yr		
		Equinox: J2000	Parallax: 0.1028295"		
			Epoch of Position: 2000.0		

Comments: Coordinates are from GSC2.3.2.
Category=STAR
Description=[CIRCUMSTELLAR MATTER, M V-IV]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	AUMIC-ACQ	(1) V-AU-MIC	STIS/CCD, ACQ, F25ND3	MIRROR			Sequence 1-7 Non-Int in Visit 05	0.4 Secs (0.4 Secs) *[==>]*	 ***[1]***
Comments: SNR = 100, V = 8.61, sp = M1Ve, Exptime rounded to nearest 0.1 second									
2	AUMIC_BAR5_CENTER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=8; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700		Sequence 1-7 Non-Int in Visit 05	133.6 Secs (133.6 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	 ***[1]***
Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target on the mid-line of BAR5. We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV. *SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.*									
3	AUMIC_BAR5_CENTER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=7; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700		Sequence 1-7 Non-Int in Visit 05	116.9 Secs (116.9 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	 ***[1]***
Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target on the mid-line of BAR5. We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV. *SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.*									
4	AUMIC_BAR5_PLUS DITHER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=8; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700	POS TARG 0.0024921,0.0122491	Sequence 1-7 Non-Int in Visit 05	133.6 Secs (133.6 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	 ***[1]***
Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target slightly above the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = 0.0024921 arcsec and y = 0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV. *SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.*									

5	AUMIC_BAR5_PLUSDITHER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=7; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700	POS TARG 0.0024921,0.0122491	Sequence 1-7 Non-Int in Visit 05	116.9 Secs (116.9 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***

Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target slightly above the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = 0.0024921 arcsec and y = 0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV.

SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.

6	AUMIC_BAR5_MINUSDITHER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=8; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700	POS TARG -0.0024921,-0.0122491	Sequence 1-7 Non-Int in Visit 05	133.6 Secs (133.6 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	***[1]***

Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target slightly below the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = -0.0024921 arcsec and y = -0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV.

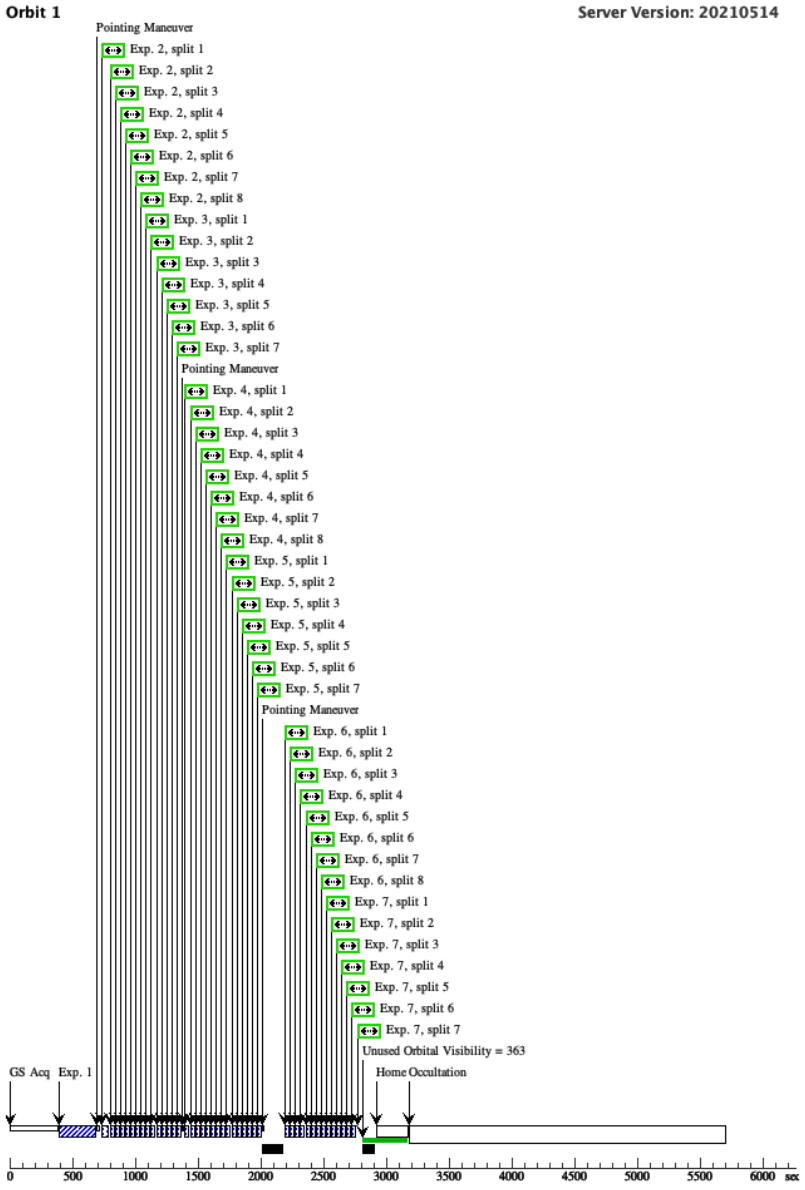
SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.

7	AUMIC_BAR5_MINUSDITHER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=7; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700	POS TARG -0.0024921,-0.0122491	Sequence 1-7 Non-Int in Visit 05	116.9 Secs (116.9 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***

Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target slightly below the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = -0.0024921 arcsec and y = -0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV.

SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.

Orbit Structure



Visit

Proposal 16780, Visit 06, implementation Wed Nov 10 12:00:31 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; ORIENT 338D TO 9 D; AFTER 05 BY 0.5 Orbits TO 1.2 Orbits

Comments: AU MIC (V=8.61, B-V = + 1.45).

This set of visits (5-8) uses BAR5. These visits (5-8) MUST be executed sequentially in contiguous orbits interrupted only for Earth occultation.

Orientation: We have set the allowable absolute orientation to range from 338 deg to 9 degrees, to allow a sufficiently large scheduling window. NOTE TO PC: AU Mic's disk has a PA of 128.7 degrees. Our science is optimized if we can achieve an absolute orient that places the major axis of AU Mic's disk perpendicular to the long axis of BAR5. We need our absolute orient to be as close as possible to (128.7 degrees + 45 degrees = 173.7 degrees; or equivalently ok 128.7 degrees + 225 degrees = 353.7 degrees). We ask that you please try to identify scheduling windows that enable us to get as close as possible to either of these absolute orientations. These orientiations place the circumstellar disk axis perpendicular to the long-axis of BAR5. We have allowed a +/-15 degree window about this strong preference to aid scheduled and GS acquisition.

Relative Timing: This visit (6) MUST immediately follow Visit 5 and immediately preceed Visit 7 in back-to-back orbits.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	V-AU-MIC	RA: 20 45 9.5323 (311.2897179d) Dec: -31 20 27.23 (-31.34090d) Equinox: J2000	Proper Motion RA: 281.424 mas/yr Proper Motion Dec: -359.895 mas/yr Parallax: 0.1028295" Epoch of Position: 2000.0	V=8.627	Reference Frame: ICRS

Comments: Coordinates are from GSC2.3.2.
Category=STAR
Description=[CIRCUMSTELLAR MATTER, M V-IV]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	AUMIC-ACQ	(1) V-AU-MIC	STIS/CCD, ACQ, F25ND3	MIRROR			Sequence 1-7 Non-Int in Visit 06	0.4 Secs (0.4 Secs) *[==>]*	 ***[1]***
Comments: SNR = 100, V = 8.61, sp = M1Ve, Exptime rounded to nearest 0.1 second									
2	AUMIC_BAR5_CENTER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=8; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700		Sequence 1-7 Non-Int in Visit 06	133.6 Secs (133.6 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	 ***[1]***
Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target on the mid-line of BAR5. We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV. *SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.*									
3	AUMIC_BAR5_CENTER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=7; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700		Sequence 1-7 Non-Int in Visit 06	116.9 Secs (116.9 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	 ***[1]***
Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target on the mid-line of BAR5. We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV. *SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.*									
4	AUMIC_BAR5_PLUS_DITHER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=8; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700	POS TARG 0.0024921,0.0122491	Sequence 1-7 Non-Int in Visit 06	133.6 Secs (133.6 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	 ***[1]***
Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target slightly above the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = 0.0024921 arcsec and y = 0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV. *SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.*									

5	AUMIC_BAR5_PLUSDITHER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=7; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700	POS TARG 0.0024921,0.0122491	Sequence 1-7 Non-Int in Visit 06	116.9 Secs (116.9 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***

Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target slightly above the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = 0.0024921 arcsec and y = 0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV.

SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.

6	AUMIC_BAR5_MINUSDITHER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=8; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700	POS TARG -0.0024921,-0.0122491	Sequence 1-7 Non-Int in Visit 06	133.6 Secs (133.6 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	***[1]***

Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target slightly below the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = -0.0024921 arcsec and y = -0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV.

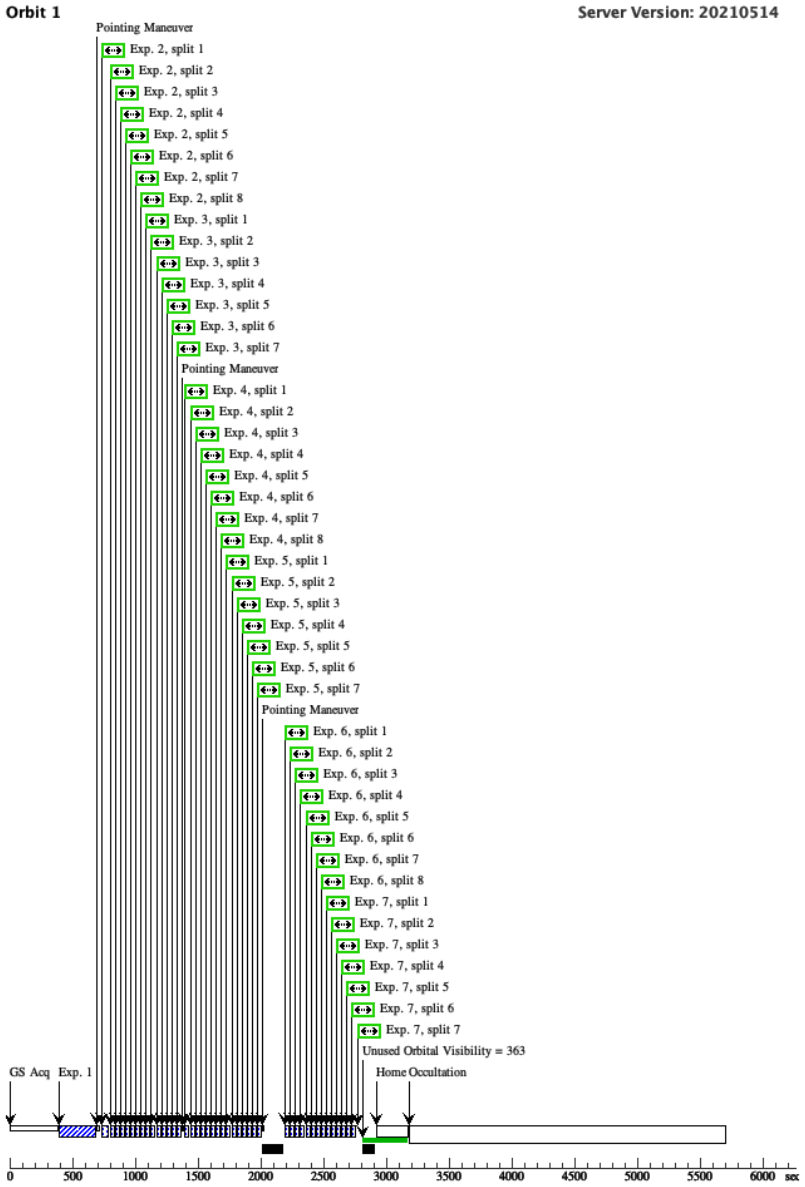
SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.

7	AUMIC_BAR5_MINUSDITHER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=7; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700	POS TARG -0.0024921,-0.0122491	Sequence 1-7 Non-Int in Visit 06	116.9 Secs (116.9 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***

Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target slightly below the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = -0.0024921 arcsec and y = -0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV.

SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.

Orbit Structure



Visit

Proposal 16780, Visit 07, implementation Wed Nov 10 12:00:31 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; AFTER 06 BY 0.5 Orbits TO 1.2 Orbits

Comments: PSF1 (HD191849). PSF calibration target for AU MIC. V = 7.97. B-V = +1.46.

This PSF star observation uses BAR5

The five visits within each set MUST be executed sequentially in contiguous orbits interrupted only for Earth occultation.

Orientation: NOTE TO OUR PC: Our PSF star visit has no absolute or relative orientation constraints. However, all other things being equal, when scheduled, we would request that both be observed with roll angles as close to Visit 6 as possible. This is not a hard requirement and we do not constrain, but a request this if possible to optimize the science return through likely better PSF calibration.

Relative Timing: This visit (7) MUST immediately follow visit 6 and immediately precede visit 8. I.e., They should be executed sequentially in "back-to-back" orbits.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	PSFSTAR-HD-191849	RA: 20 13 53.3960 (303.4724833d) Dec: -45 09 50.47 (-45.16402d) Equinox: J2000	Proper Motion RA: 778.236 mas/yr Proper Motion Dec: -159.744 mas/yr Parallax: 0.1623212" Epoch of Position: 2000.0	V=7.966	Reference Frame: ICRS

Comments: Coordinates from GSC2.3.2.
Category=STAR
Description=[M V-IV]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	PSF1-ACQ	(2) PSFSTAR-HD-191849	STIS/CCD, ACQ, F25ND3	MIRROR		GS ACQ SCENARIO BASE1B3	Sequence 1-7 Non-Int in Visit 07	0.3 Secs (0.3 Secs) *[==>]*	 ***[1]***
Comments: SNR = 100, V = 7.97, sp = M0Ve, Exptime rounded to nearest 0.1 second									
2	PSF1_BAR5_CENTER	(2) PSFSTAR-HD-191849	STIS/CCD, ACCUM, BAR5	MIRROR	SIZEAXIS2=237; GAIN=4; CR-SPLIT=8; CENTERAXIS2=700		Sequence 1-7 Non-Int in Visit 07	92 Secs (92 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	 ***[1]***
Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture) that we comissioned in GO program 12923. Here we attempt to place the target on the mid-line of BAR5. We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 100 (the same that we used for GO program 13786) *SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 11.5 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 11.5 second exposures.*									
3	PSF1_BAR5_CENTER	(2) PSFSTAR-HD-191849	STIS/CCD, ACCUM, BAR5	MIRROR	SIZEAXIS2=237; GAIN=4; CENTERAXIS2=700; CR-SPLIT=8		Sequence 1-7 Non-Int in Visit 07	92 Secs (92 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	 ***[1]***
Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture) that we comissioned in GO program 12923. Here we attempt to place the target on the mid-line of BAR5. We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 100 (the same that we used for GO program 13786) *SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 11.5 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 11.5 second exposures.*									
4	PSF1_BAR5_PLUSDITHER	(2) PSFSTAR-HD-191849	STIS/CCD, ACCUM, BAR5	MIRROR	SIZEAXIS2=237; GAIN=4; CR-SPLIT=8; CENTERAXIS2=700	POS TARG 0.0024921,0.0122491	Sequence 1-7 Non-Int in Visit 07	92 Secs (92 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	 ***[1]***
Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture) that we comissioned in GO program 12923. Here we attempt to place the target slightly above the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = 0.0024921 arcsec and y = 0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 100 (the same that we used for GO program 13786) *SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 11.5 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 11.5 second exposures.*									

5	PSF1_BAR5_PLUSDITHER	(2) PSFSTAR-HD-191849	STIS/CCD, ACCUM, BAR5	MIRROR	SIZEAXIS2=237; GAIN=4; CENTERAXIS2=700; CR-SPLIT=8	POS TARG 0.0024921,0.0122491	Sequence 1-7 Non-Int in Visit 07	92 Secs (92 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	***[1]***

Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture) that we comissioned in GO program 12923.
Here we attempt to place the target slightly above the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = 0.0024921 arcsec and y = 0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 100 (the same that we used for GO program 13786)

SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 11.5 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 11.5 second exposures.

6	PSF1_BAR5_MINUSDITHER	(2) PSFSTAR-HD-191849	STIS/CCD, ACCUM, BAR5	MIRROR	SIZEAXIS2=237; GAIN=4; CR-SPLIT=8; CENTERAXIS2=700	POS TARG -0.0024921,-0.0122491	Sequence 1-7 Non-Int in Visit 07	92 Secs (92 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	***[1]***

Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture) that we comissioned in GO program 12923.
Here we attempt to place the target slightly below the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = 0.0024921 arcsec and y = -0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 100 (the same that we used for GO program 13786)

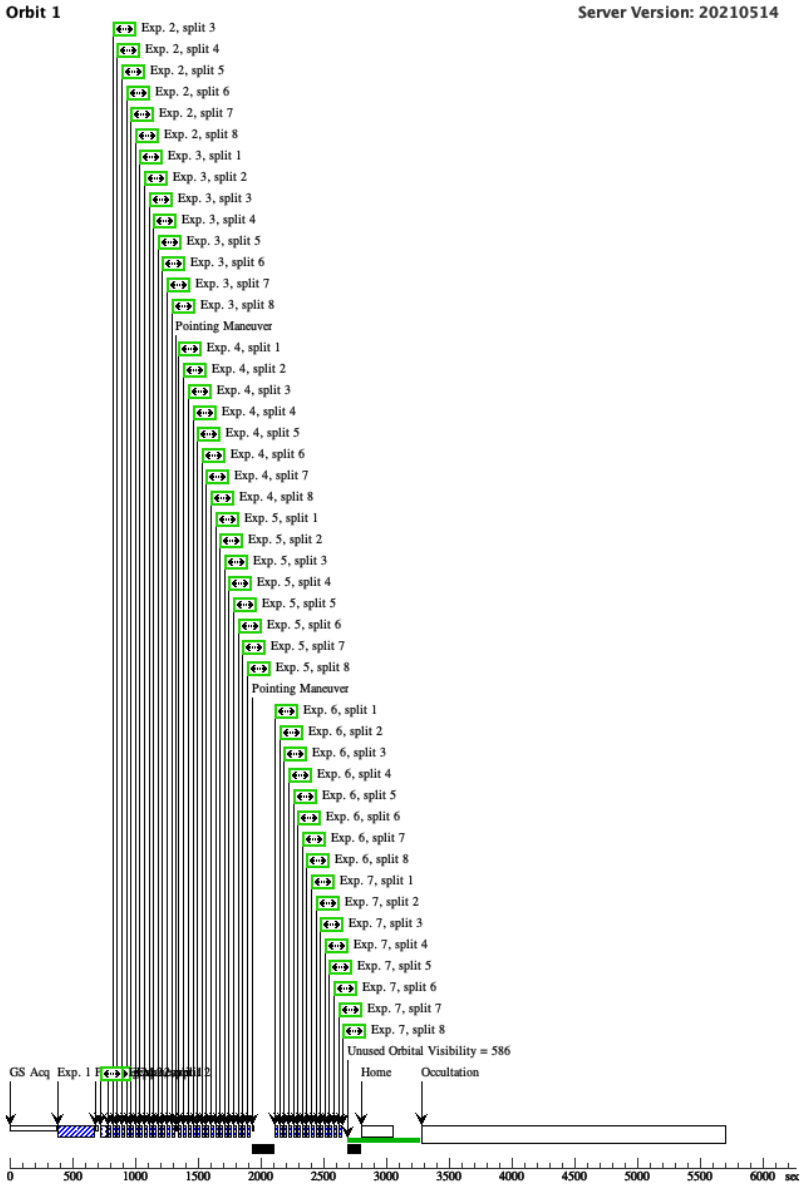
SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 11.5 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 11.5 second exposures.

7	PSF1_BAR5_MINUSDITHER	(2) PSFSTAR-HD-191849	STIS/CCD, ACCUM, BAR5	MIRROR	SIZEAXIS2=237; GAIN=4; CENTERAXIS2=700; CR-SPLIT=8	POS TARG -0.0024921,-0.0122491	Sequence 1-7 Non-Int in Visit 07	92 Secs (92 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	***[1]***

Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture) that we comissioned in GO program 12923.
Here we attempt to place the target slightly below the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = 0.0024921 arcsec and y = -0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 100 (the same that we used for GO program 13786)

SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 11.5 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 11.5 second exposures.

Orbit Structure



Visit

Proposal 16780, Visit 08, implementation Wed Nov 10 12:00:31 GMT 2021

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; GUID TOL 0.005"; GYRO MODE 3GOBAD; ORIENT 4.0D TO 6.5D FROM 06; AFTER 07 BY 0.5 Orbits TO 1.2 Orbits

Comments: AU MIC (V=8.61, B-V = + 1.45).

This set of visits (5-8) uses BAR5. These visits (5-8) MUST be executed sequentially in contiguous orbits interrupted only for Earth occultation.

Orientation: We have set the allowable orientation to range from +4 deg to +6.5 degrees from Visit 6, to allow a sufficiently large scheduling window. NOTE TO PC: Our science is optimized if we can achieve an orient as close as possible to +6.5 degrees from the preferred absolute orient of 353.7 degrees in Visit 6. We ask that you please try to identify scheduling windows that enable us to get as close as possible to this orientation. IF the absolute orient of Visit 6 deviates from 353.7 degrees, PLEASE ask us for guidance as to the orientation range we prefer for Visit 7. We absolutely do NOT want the disk major axis (128.7 degrees) to align with the STIS diffration spikes in Visits 5,6, or 8.

Relative Timing: This visit (7) MUST immediately follow Visit 6. I.e., They should be executed sequentially in "back-to-back" orbits.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	V-AU-MIC	RA: 20 45 9.5323 (311.2897179d) Dec: -31 20 27.23 (-31.34090d) Equinox: J2000	Proper Motion RA: 281.424 mas/yr Proper Motion Dec: -359.895 mas/yr Parallax: 0.1028295" Epoch of Position: 2000.0	V=8.627	Reference Frame: ICRS

Comments: Coordinates are from GSC2.3.2.
Category=STAR
Description=[CIRCUMSTELLAR MATTER, M V-IV]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	AUMIC-ACQ	(1) V-AU-MIC	STIS/CCD, ACQ, F25ND3	MIRROR			Sequence 1-7 Non-Int in Visit 08	0.4 Secs (0.4 Secs) *[==>]*	 ***[1]***
Comments: SNR = 100, V = 8.61, sp = M1Ve, Exptime rounded to nearest 0.1 second									
2	AUMIC_BAR5_CENTER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=8; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700		Sequence 1-7 Non-Int in Visit 08	133.6 Secs (133.6 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	 ***[1]***
Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target on the mid-line of BAR5. We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV. *SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.*									
3	AUMIC_BAR5_CENTER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=7; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700		Sequence 1-7 Non-Int in Visit 08	116.9 Secs (116.9 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	 ***[1]***
Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target on the mid-line of BAR5. We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV. *SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.*									
4	AUMIC_BAR5_PLUS DITHER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=8; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700	POS TARG 0.0024921,0.0122491	Sequence 1-7 Non-Int in Visit 08	133.6 Secs (133.6 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	 ***[1]***
Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target slightly above the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = 0.0024921 arcsec and y = 0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV. *SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.*									

5	AUMIC_BAR5_PLUSDITHER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=7; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700	POS TARG 0.0024921,0.0122491	Sequence 1-7 Non-Int in Visit 08	116.9 Secs (116.9 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***

Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target slightly above the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = 0.0024921 arcsec and y = 0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV.

SCALABLE BENCHMARK: We scale our exposure times from GO-12923. We expect that 16.7 seconds per exposure will yield 75% to saturation in the brightest pixel. Our exposures are thus comprised of CR-SPLITS in integral units of 16.7 second exposures.

6	AUMIC_BAR5_MINUSDITHER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=8; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700	POS TARG -0.0024921,-0.0122491	Sequence 1-7 Non-Int in Visit 08	133.6 Secs (133.6 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]* *[==>(Split 8)]*	***[1]***

Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target slightly below the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = -0.0024921 arcsec and y = -0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV.

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7	AUMIC_BAR5_MINUSDITHER	(1) V-AU-MIC	STIS/CCD, ACCUM, BAR5	MIRROR	CR-SPLIT=7; GAIN=4; SIZEAXIS2=237; CENTERAXIS2=700	POS TARG -0.0024921,-0.0122491	Sequence 1-7 Non-Int in Visit 08	116.9 Secs (116.9 Secs) *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]* *[==>(Split 5)]* *[==>(Split 6)]* *[==>(Split 7)]*	***[1]***

Comments: NOTE TO PC/CS: Here we use the BAR5 occulter (Aperture), and attempt to place the target slightly below the mid-line of BAR5, using a 0.25 pixel dither perpendicular to the BAR5 long-axis (via POS TARG offsets of x = -0.0024921 arcsec and y = -0.0122491). We then use a subarray readout of CENTYERAXIS2 = 700 appopriate for BAR5 with a SIZEAXIS2 = 237 to yield a 6" round FOV.

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Orbit Structure