16188 - Calibration of Scattered Light in STIS grating G230LB

Cycle: 28, Proposal Category: GO

(Calibration, UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
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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	(2) HD102212	STIS/CCD STIS/NUV-MAMA	2	30-Jun-2020 15:00:45.0	yes
02	(6) HD013520	STIS/CCD STIS/NUV-MAMA	2	30-Jun-2020 15:00:47.0	yes
03	(4) BD+41D3306	STIS/CCD STIS/NUV-MAMA	2	30-Jun-2020 15:00:49.0	yes

6 Total Orbits Used

ABSTRACT

This calibration proposal measures light scattered by the G230LB grating paired with the CCD detector on STIS. The improvement will have immediate impact on the fidelity of the Next Generation Spectral Library. The observational scheme is to observe three stars of differing temperature in two similar modes; CCD+G230LB and MAMA+G230L. Because the MAMA is mostly insensitive to red light, only the CCD spectra will show the scattered light problem. The scattered light will be modeled and applied to the NGSL.

In addition, the dependence of scattered light on the position of the star relative to the centerline of the slit at the time of exposure will be measured.

OBSERVING DESCRIPTION

Three bright stars previously observed as part of the NGSL project are chosen at roughly K0, K5, and M1 spectral types. Except for the quantities we intentionally vary, the observing configuration generally mimics the NGSL, in particular, the 0.2 arcsec slit width and the E1 spatial observing position for the CCD spectral observations through G230LB.

The observing cadence is two orbits per star, one with MAMA/G230L, the other with CCD/G230LB. Unlike NGSL, we perform the normal peakup to center the star in the slit. After a cr-split exposure, we dither redward and blueward in 0.05 arcsec steps to gauge the impact of off-center object positioning on the properties of the scattered light.

The result is 3 stars $\times$ 2 detectors $\times$ 5 or 7 positions within the slit, which should allow a clean calibration of the temperature dependence and slit-position dependendence of the scattered light in G230LB.

Visit

Proposal 16188, HD 102212 (01) Tue Jun 30 19:00:50 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/NUV-MAMA, STIS/CCD

Special Requirements: PCS MODE FINE

Comments: Bright M1 III star

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(3)
	Purpose=OTHER	Pattern Orientation=0.0		
	Number Of Points=5	Angle Between Sides=		
	Point Spacing=0.05	Center Pattern=true		
	Line Spacing=			
(2)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(4)
	Purpose=OTHER	Pattern Orientation=0.0		
	Number Of Points=7	Angle Between Sides=		
	Point Spacing=0.05	Center Pattern=true		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HD102212	RA: 11 45 51.5596 (176.4648317d)	Proper Motion RA: -18.96 mas/yr	V=4.04+/-0.03	Reference Frame: ICRS
	Alt Name1: NU-VIR	Dec: +06 31 45.74 (6.52937d)	Proper Motion Dec: -181.56 mas/yr	U = 7.32,	
		Equinox: J2000	Parallax: 0.0111"	K = 0.07	
			Epoch of Position: 2000.0		

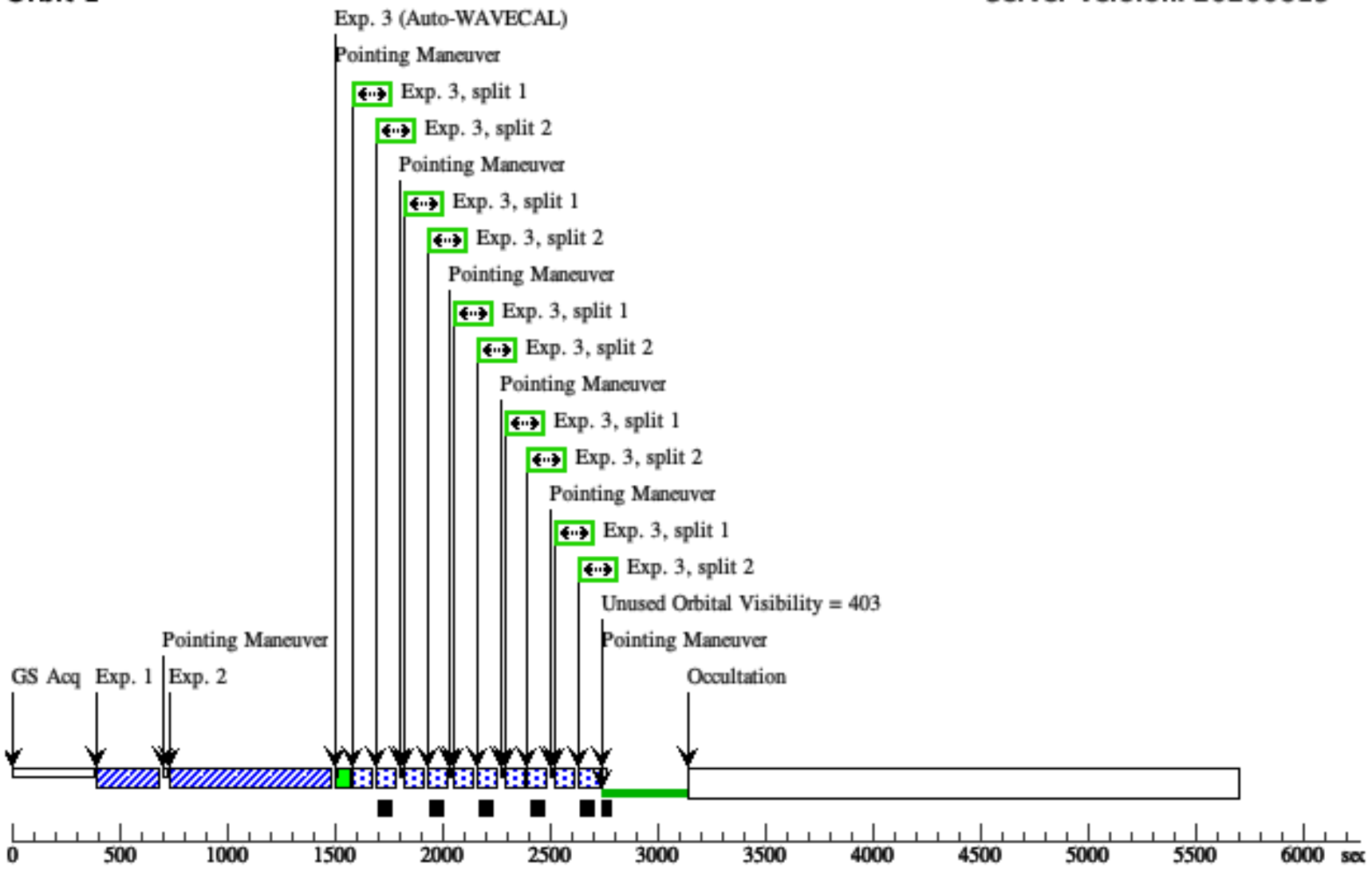
Comments: Long period variable star with variation +/- 0.03 mag.

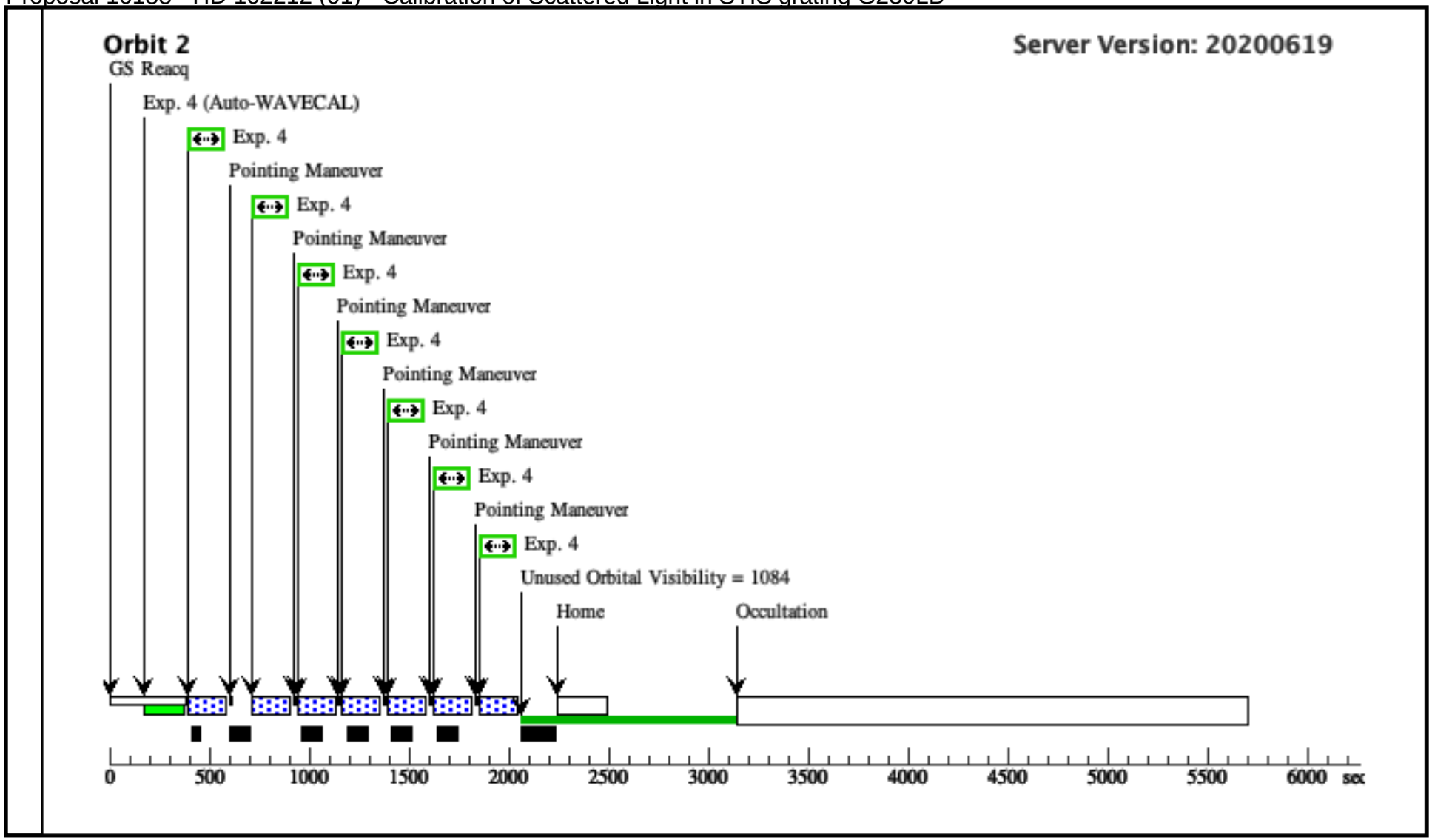
This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=STAR
Description=[M III-I]
Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(STIS.ta.1451030)	(2) HD102212	STIS/CCD, ACQ, F25ND5	MIRROR				0.5 Secs (0.5 Secs) *[==>]*	 ***[1]***
2	(STIS.sp.1451077)	(2) HD102212	STIS/CCD, ACQ/PEAK, 52X0.1E1	G230LB 2375 A				40 Secs (40 Secs) *[==>]*	 ***[1]***
Comments: This target is too bright for a white light peakup. Target will be considerably brighter at the detector than the ETC predicts due to scattered red light in the grism. *Science exposures will be through the 52 x 0.2" E1 aperture. Slit-to-slit pointing shift jitter is 0.005".*									
3	(STIS.sp.1451096)	(2) HD102212	STIS/CCD, ACCUM, 52X0.2E1	G230LB 2375 A			Pattern 1, Exps 3-3 in HD 102212 (01) (1)	120.0 Secs (600 Secs) *[==>(Pattern 1, Split 1)]* *[==>(Pattern 1, Split 2)]* *[==>(Pattern 2, Split 1)]* *[==>(Pattern 2, Split 2)]* *[==>(Pattern 3, Split 1)]* *[==>(Pattern 3, Split 2)]* *[==>(Pattern 4, Split 1)]* *[==>(Pattern 4, Split 2)]* *[==>(Pattern 5, Split 1)]* *[==>(Pattern 5, Split 2)]*	 ***[1]***
Comments: Science exposures, dithered +/- 0.05 arcsec from slit center.									
4	(STIS.sp.1451111)	(2) HD102212	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A			Pattern 2, Exps 4-4 in HD 102212 (01) (2)	180 Secs (1260 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]* *[==>(Pattern 6)]* *[==>(Pattern 7)]*	 ***[2]***

Orbit Structure




Orbit 2
Server Version: 20200619
GS Reacq
Exp. 4 (Auto-WAVECAL)
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Unused Orbital Visibility = 1084
Home
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16188, HD 013520 (02) Tue Jun 30 19:00:51 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/NUV-MAMA, STIS/CCD

Special Requirements: PCS MODE FINE

Comments: Bright K4 III star

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(3)
	Purpose=OTHER	Pattern Orientation=0.0		
	Number Of Points=5	Angle Between Sides=		
	Point Spacing=0.05	Center Pattern=true		
	Line Spacing=			
(2)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(4)
	Purpose=OTHER	Pattern Orientation=0.0		
	Number Of Points=7	Angle Between Sides=		
	Point Spacing=0.05	Center Pattern=true		
	Line Spacing=			

Fixed Targets

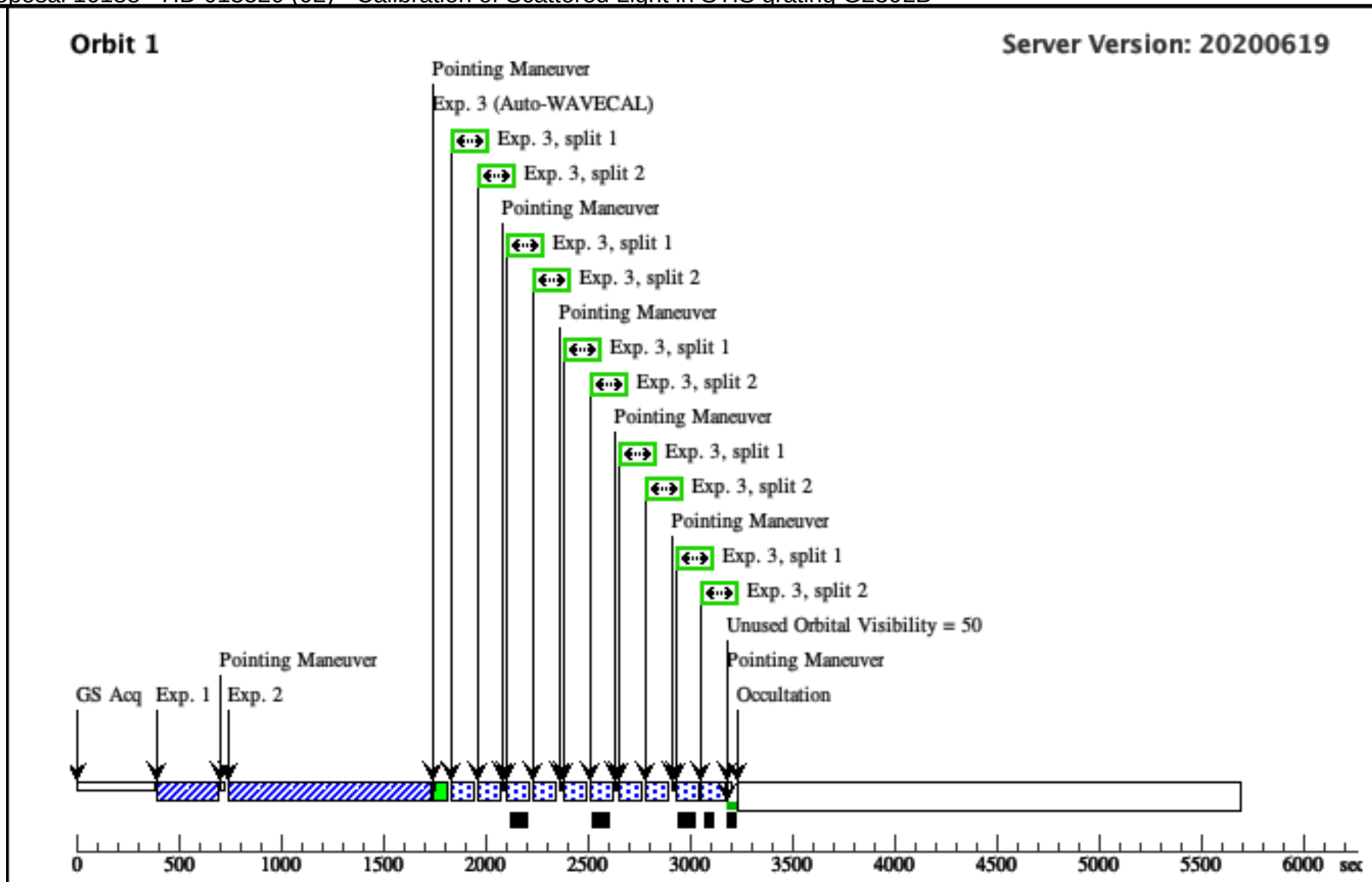
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	HD013520	RA: 02 13 13.3222 (33.3055092d)	Proper Motion RA: -20.90 mas/yr	V=4.826	Reference Frame: ICRS
		Dec: +44 13 53.93 (44.23165d)	Proper Motion Dec: -14.46 mas/yr		
		Equinox: J2000	Parallax: 0.0052634"		
			Epoch of Position: 2000.0		

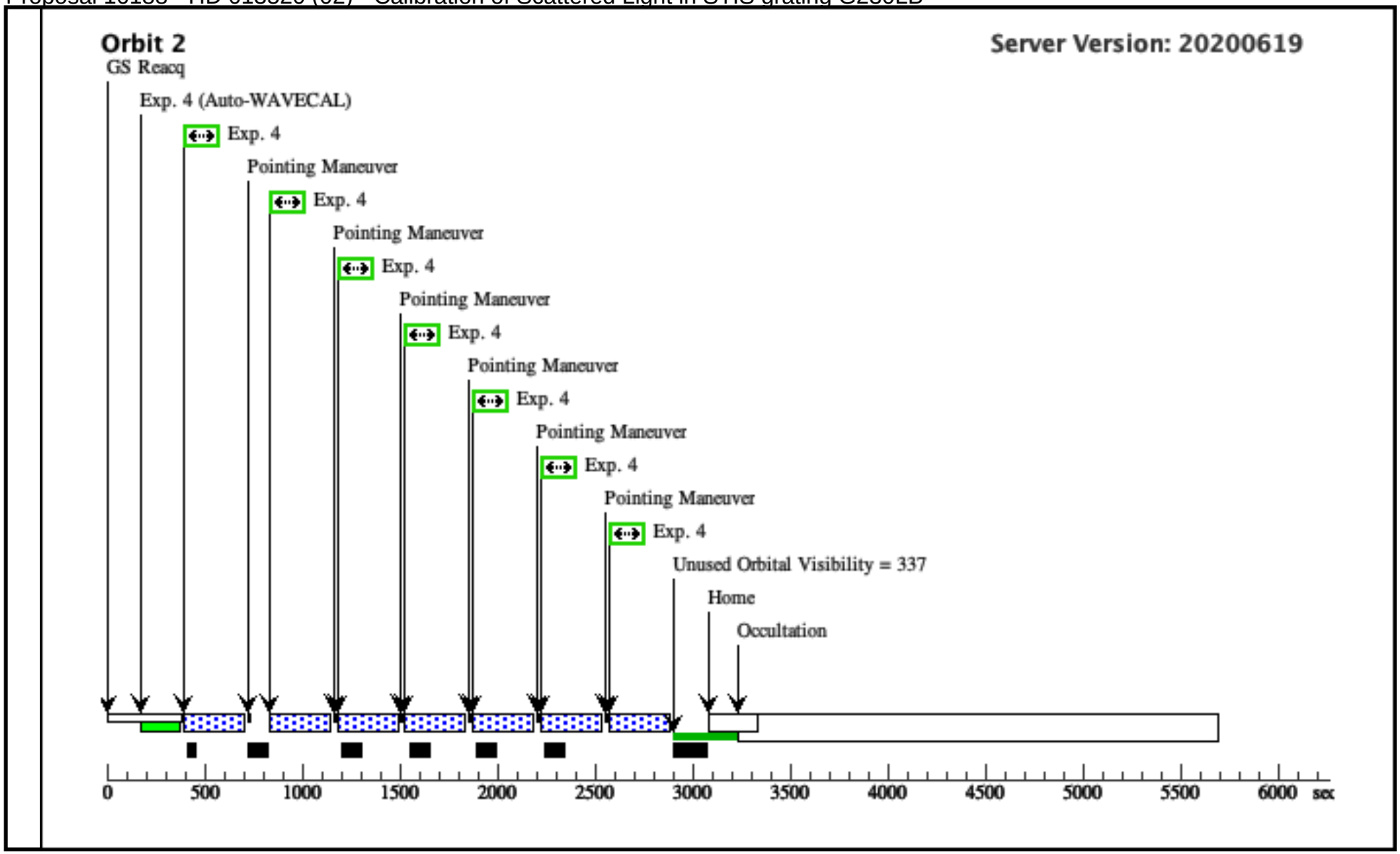
Comments: K4 III star
Category=STAR
Description=[K III-I]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(STIS.ta.1451202)	(6) HD013520	STIS/CCD, ACQ, F25ND5	MIRROR				2.0 Secs (2 Secs) *[==>]*	 ***[1]***
Comments: Bright K5 giant.									
2	(STIS.sp.1451206)	(6) HD013520	STIS/CCD, ACQ/PEAK, 52X0.1E1	G230LB 2375 A				60 Secs (60 Secs) *[==>]*	 ***[1]***
Comments: This target is too bright for a white light peakup. Target will be somewhat brighter at the detector than the ETC predicts due to scattered red light in the grism. *Science exposures will be through the 52 x 0.2" E1 aperture. Slit-to-slit pointing shift jitter is 0.005".*									
3	(STIS.sp.1451214)	(6) HD013520	STIS/CCD, ACCUM, 52X0.2E1	G230LB 2375 A			Pattern 1, Exps 3-3 in HD 013520 (02) (1)	160.0 Secs (800 Secs) *[==>(Pattern 1, Split 1)]* *[==>(Pattern 1, Split 2)]* *[==>(Pattern 2, Split 1)]* *[==>(Pattern 2, Split 2)]* *[==>(Pattern 3, Split 1)]* *[==>(Pattern 3, Split 2)]* *[==>(Pattern 4, Split 1)]* *[==>(Pattern 4, Split 2)]* *[==>(Pattern 5, Split 1)]* *[==>(Pattern 5, Split 2)]*	 ***[1]***
Comments: Science exposures, dithered from slit center.									
4	(STIS.sp.1451216)	(6) HD013520	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A			Pattern 2, Exps 4-4 in HD 013520 (02) (2)	300 Secs (2100 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]* *[==>(Pattern 6)]* *[==>(Pattern 7)]*	 ***[2]***

Orbit Structure




Orbit 2
Server Version: 20200619
GS Reacq
Exp. 4 (Auto-WAVECAL)
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Unused Orbital Visibility = 337
Home
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16188, BD +41 3306 (03) Tue Jun 30 19:00:51 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/NUV-MAMA, STIS/CCD

Special Requirements: PCS MODE FINE

Comments: K0 V star

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(3)
	Purpose=OTHER	Pattern Orientation=0.0		
	Number Of Points=5	Angle Between Sides=		
	Point Spacing=0.05	Center Pattern=true		
	Line Spacing=			
(2)	Pattern Type=STIS-PERP-TO-SLIT	Coordinate Frame=POS-TARG		(4)
	Purpose=OTHER	Pattern Orientation=0.0		
	Number Of Points=7	Angle Between Sides=		
	Point Spacing=0.05	Center Pattern=true		
	Line Spacing=			

Fixed Targets

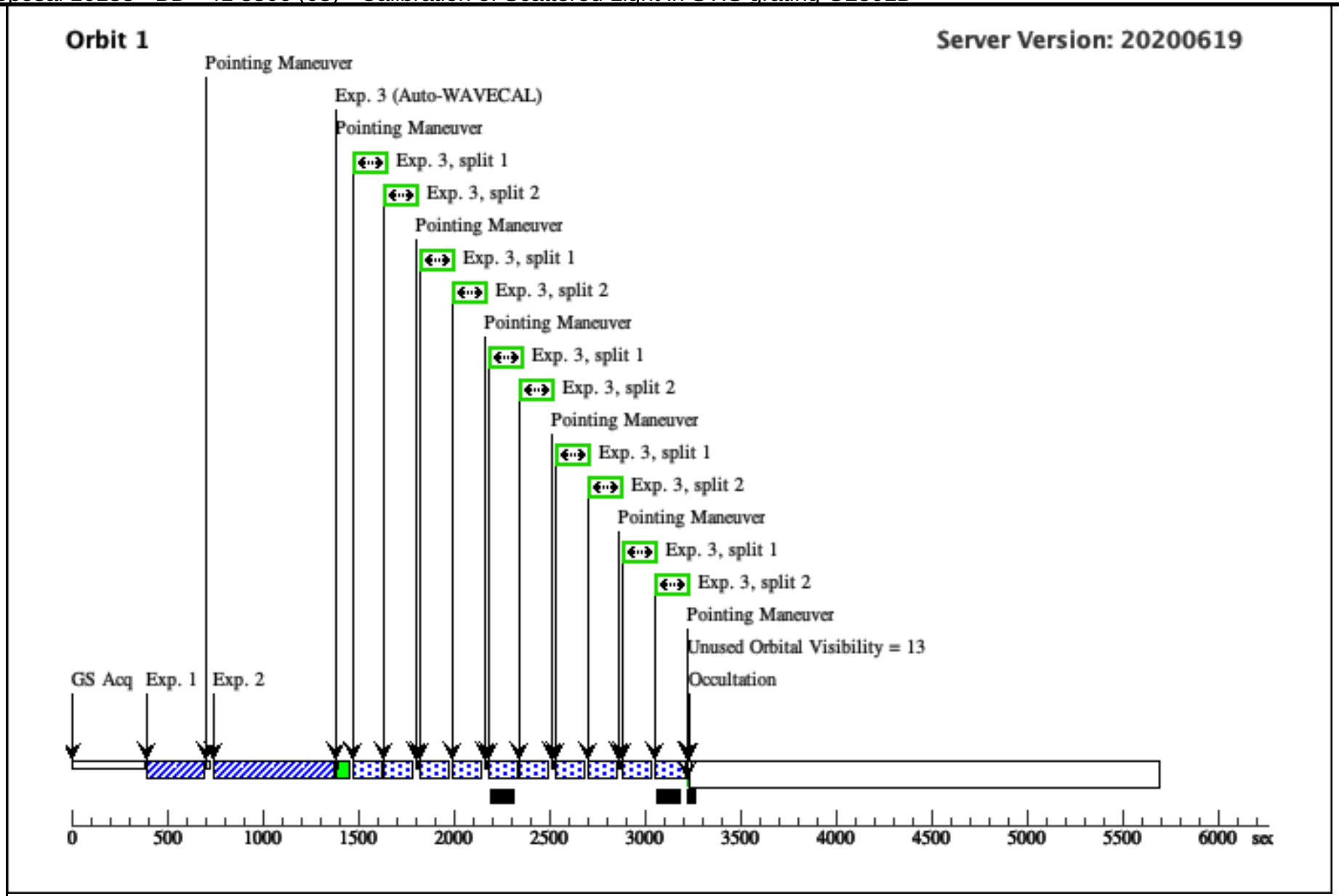
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	BD+41D3306	RA: 19 19 0.5488 (289.7522867d)	Proper Motion RA: 94.682 mas/yr	V=8.86	Reference Frame: ICRS
		Dec: +41 38 4.58 (41.63461d)	Proper Motion Dec: -632.202 mas/yr	U=10.01,	
		Equinox: J2000	Parallax: 0.0274137"	K=6.703	
			Epoch of Position: 2000.0		

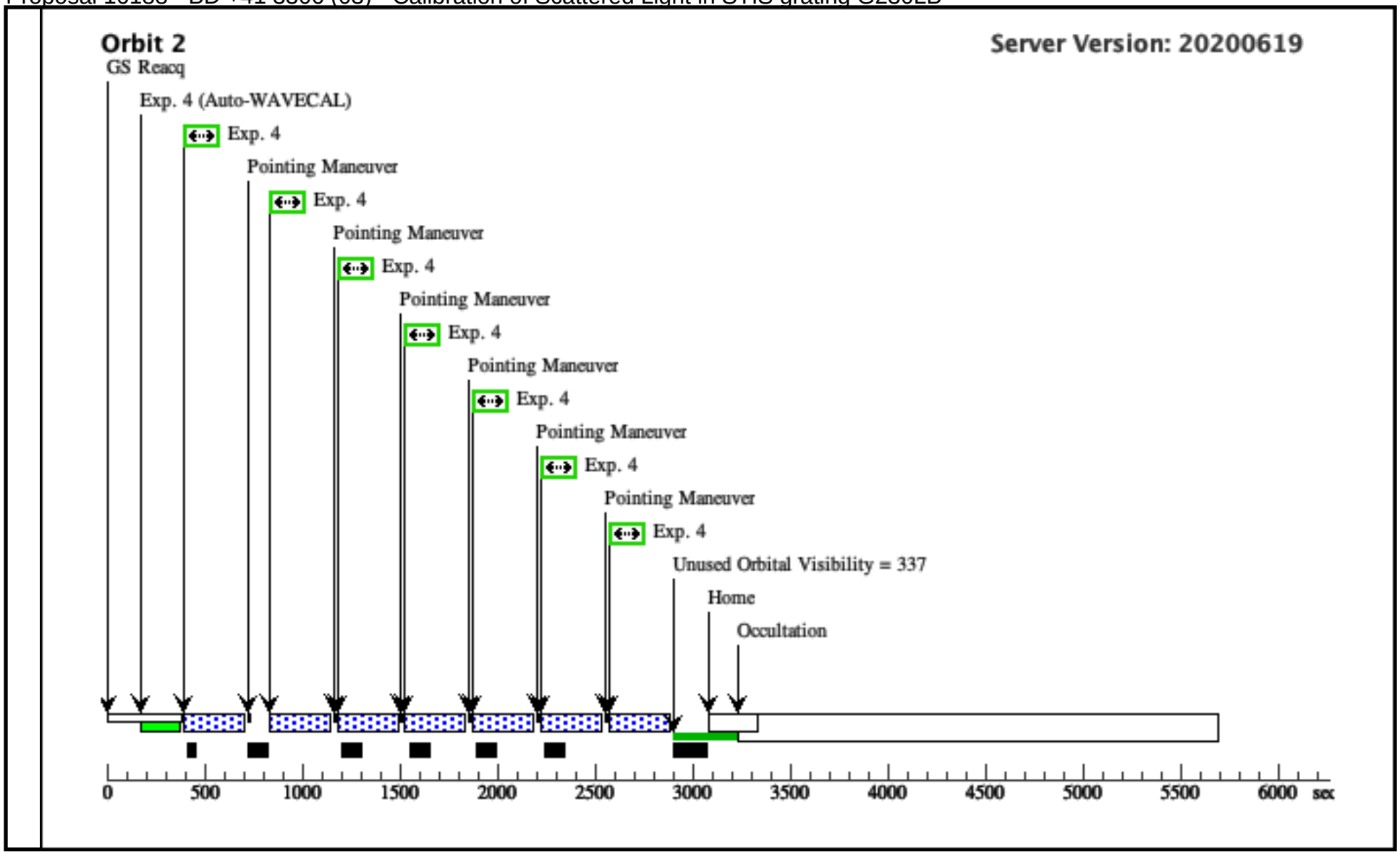
Comments: Rotation detected from star spots, period 49.40 days.
Category=STAR
Description=[K V-IV]

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	(STIS.ta.1451178)	(4) BD+41D3306	STIS/CCD, ACQ, F25ND3	MIRROR				1.0 Secs (1 Secs) *[==>]*	 ***[1]***
2	(STIS.sp.1451186)	(4) BD+41D3306	STIS/CCD, ACQ/PEAK, 52X0.1E1	G230LB 2375 A				30.0 Secs (30 Secs) *[==>]*	 ***[1]***
Comments: This target is (borderline) too bright for a white light peakup. *Science exposures will be through the 52 x 0.2" E1 aperture. Slit-to-slit pointing shift jitter is 0.005".*									
3	(STIS.sp.1451189)	(4) BD+41D3306	STIS/CCD, ACCUM, 52X0.2E1	G230LB 2375 A			Pattern 1, Exps 3-3 in BD +41 3306 (03) (1)	240.0 Secs (1200 Secs) *[==>(Pattern 1, Split 1)]* *[==>(Pattern 1, Split 2)]* *[==>(Pattern 2, Split 1)]* *[==>(Pattern 2, Split 2)]* *[==>(Pattern 3, Split 1)]* *[==>(Pattern 3, Split 2)]* *[==>(Pattern 4, Split 1)]* *[==>(Pattern 4, Split 2)]* *[==>(Pattern 5, Split 1)]* *[==>(Pattern 5, Split 2)]*	 ***[1]***
Comments: Science exposures, dithered from slit center									
4	(STIS.sp.1451190)	(4) BD+41D3306	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A			Pattern 2, Exps 4-4 in BD +41 3306 (03) (2)	300 Secs (2100 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]* *[==>(Pattern 5)]* *[==>(Pattern 6)]* *[==>(Pattern 7)]*	 ***[2]***

Orbit Structure




Orbit 2
Server Version: 20200619
GS Reacq
Exp. 4 (Auto-WAVECAL)
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Unused Orbital Visibility = 337
Home
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec