



16451 - A STIS view of ASASSN-14ko: uncovering the nature of the recently discovered periodic nuclear transient

Cycle: 28, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) ASASSN-14KO	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	2	17-Dec-2020 16:00:16.0	yes
02	(1) ASASSN-14KO	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	2	17-Dec-2020 16:00:18.0	yes

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
03	(1) ASASSN-14KO	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	1	17-Dec-2020 16:00:19.0	yes
04	(1) ASASSN-14KO	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	2	17-Dec-2020 16:00:21.0	yes

7 Total Orbits Used

ABSTRACT

ASASSN-14ko is a recently discovered, periodically flaring, nuclear transient within known AGN ESO 253-G003. The flares have a mean period of ~114 days and a nonzero, negative period derivative. The exact origin of these UV/optical flares is currently unknown. Here we propose a four epoch STIS UV set of observations of the next predicted flare in December 2020. The prior 6+ years of seventeen observed flares seen in ASAS-SN tightly constrains the predicted times of pre-flare quiescence, rise, peak, and decline. These observations will be part of a much larger followup effort but the UV spectroscopy is pivotal. We will measure the evolution of UV absorption and emission lines from elements (e.g., C, N, Si) and ionization states/potentials not seen in optical spectra, which will directly help distinguish whether or not these flares are caused by a partial TDE, AGN disk accretion, or another high energy phenomenon.

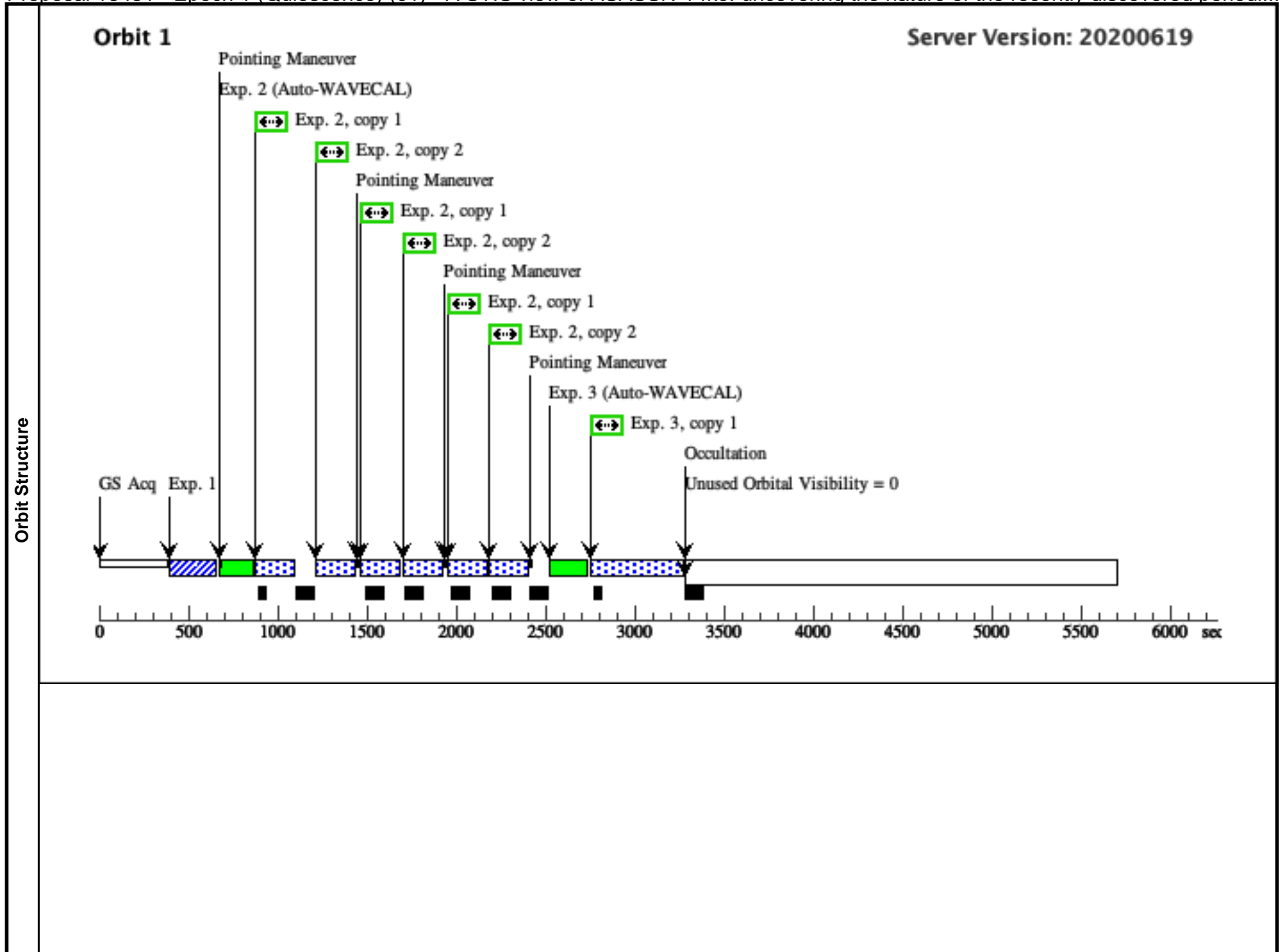
OBSERVING DESCRIPTION

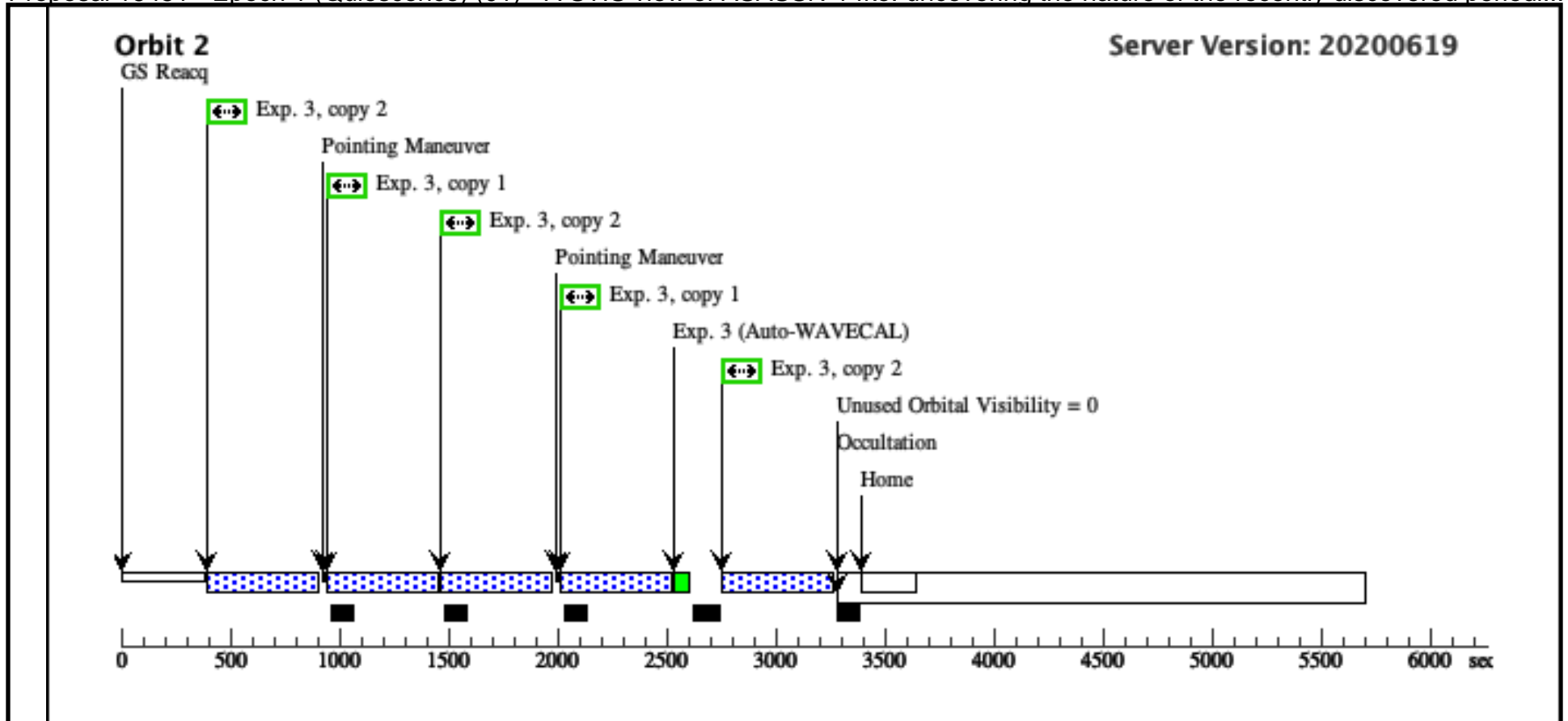
The impact of reduced-gyro operations on this project are uncertain, but, given that the epochs of these observations are highly constrained it is likely that the effect will be to further constrain or eliminate some of the epochs.

Proposal 16451 - Epoch 1 (Quiescence) (01) - A STIS view of ASASSN-14ko: uncovering the nature of the recently discovered period...

Thu Dec 17 21:00:21 GMT 2020

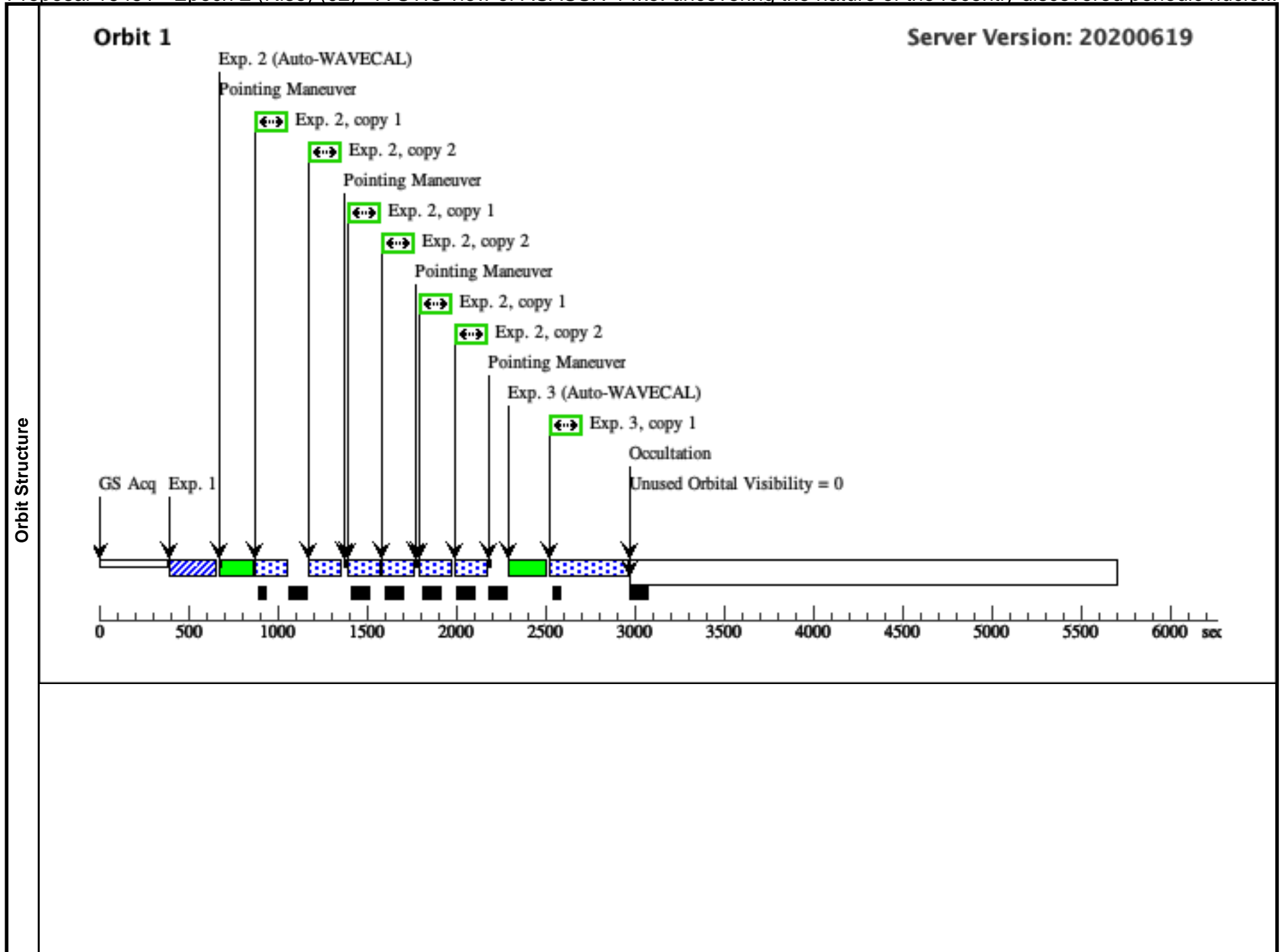
Visit	Proposal 16451, Epoch 1 (Quiescence) (01), implementation Diagnostic Status: No Diagnostics Scientific Instruments: STIS/NUV-MAMA, STIS/CCD, STIS/FUV-MAMA Special Requirements: BETWEEN 05-MAR-2021:00:00:00 AND 20-MAR-2021:00:00:00 Comments: <i>Quiescence before ASASSN-14ko Dec 2020 outburst</i>									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(2)	Pattern Type=STIS-ALONG-SLIT Coordinate Frame=POS-TARG Purpose=DITHER Pattern Orientation=90.0 Number Of Points=3 Angle Between Sides= Point Spacing=0.3829 Center Pattern=false Line Spacing=		(2), (3)						
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	ASASSN-14KO	RA: 05 25 18.1170 (81.3254875d) Dec: -46 00 20.23 (-46.00562d) Equinox: J2000	Epoch of Position: 2015.5 Redshift: 0.042489	V=14.5+/-0.2 at peak: W1=15.69(0.04), M2=15.66(0.07), and W2=15.64(0.04)	Reference Frame: ICRS				
Comments: <i>Note, this is the nucleus of a galaxy, but, it is a complex galaxy. Please see submission notes.</i> Category=GALAXY Description=[ACCRETION DISK, MULTIPLE NUCLEI, NUCLEUS, QUASAR]										
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(STIS.ta.147 2418)	(1) ASASSN-14KO	STIS/CCD, ACQ, 50CCD	MIRROR				5 Secs (5 Secs)	
									[==>]	[1]
	2	(STIS.sp.14 72410)	(1) ASASSN-14KO	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A			Pattern 2, Exps 2-2 in Epoch 1 (Quiescence) (01) (2)	150 Secs X 2 (1242 Secs) [==>207.0 Secs (Pattern 1, Copy 1)] [==>207.0 Secs (Pattern 1, Copy 2)] [==>207.0 Secs (Pattern 2, Copy 1)] [==>207.0 Secs (Pattern 2, Copy 2)] [==>207.0 Secs (Pattern 3, Copy 1)] [==>207.0 Secs (Pattern 3, Copy 2)]	[1]
3	(STIS.sp.14 72413)	(1) ASASSN-14KO	STIS/FUV-MAMA, ACCUM, 52X0.2	G140L 1425 A			Pattern 2, Exps 3-3 in Epoch 1 (Quiescence) (01) (2)	500 Secs X 2 (3004 Secs) [==>502.0 Secs (Pattern 1, Copy 1)] [==>(Pattern 1, Copy 2)] [==>(Pattern 2, Copy 1)] [==>(Pattern 2, Copy 2)] [==>501.0 Secs (Pattern 3, Copy 1)] [==>501.0 Secs (Pattern 3, Copy 2)]	[1] [2]	

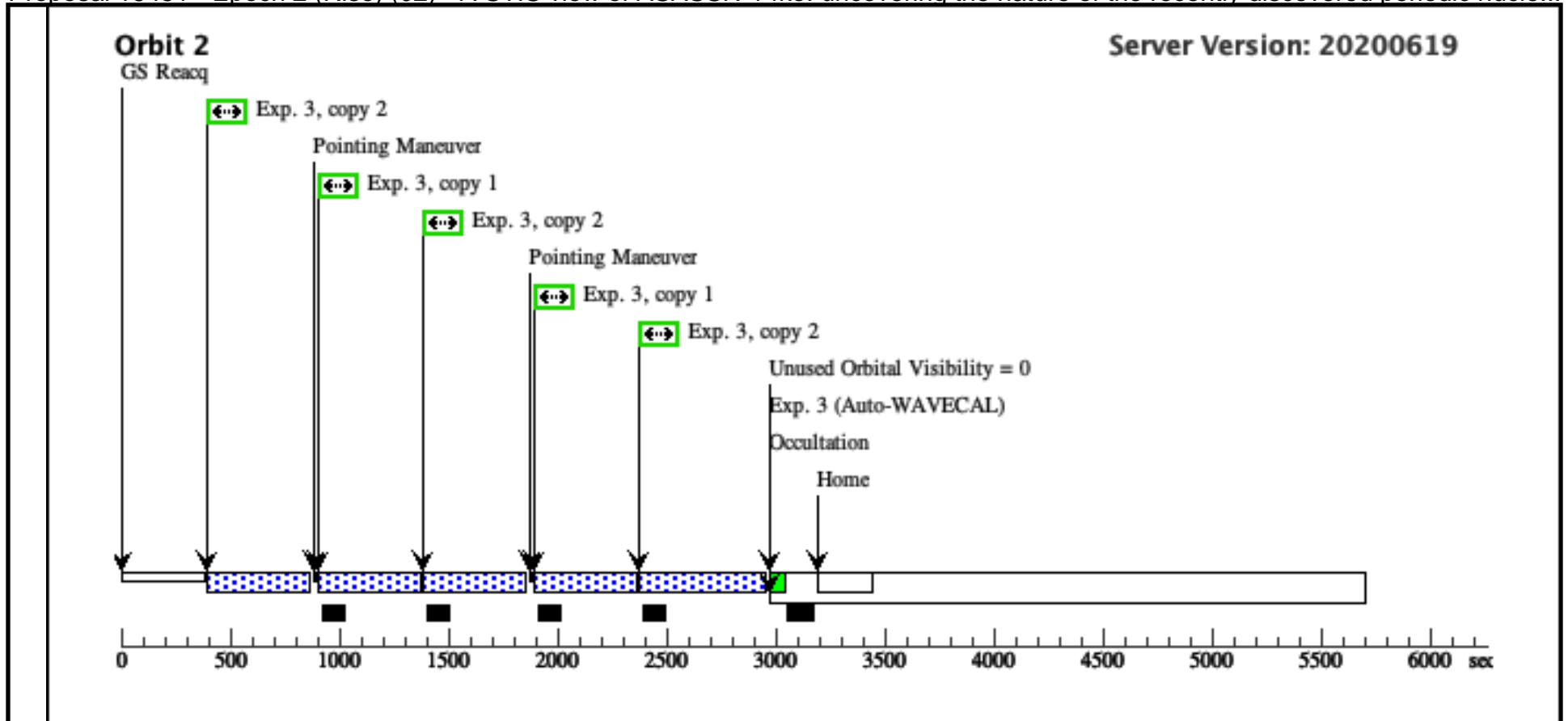




Proposal 16451 - Epoch 2 (Rise) (02) - A STIS view of ASASSN-14ko: uncovering the nature of the recently discovered periodic nucle...

Visit	Proposal 16451, Epoch 2 (Rise) (02), scheduled Diagnostic Status: No Diagnostics Scientific Instruments: STIS/NUV-MAMA, STIS/CCD, STIS/FUV-MAMA Special Requirements: SCHED 90%; BETWEEN 17-DEC-2020:00:00:00 AND 19-DEC-2020:00:00:00 <i>Comments: Rise of ASASSN-14ko Dec 2020 outburst</i>					Thu Dec 17 21:00:22 GMT 2020				
Patterns	#	Primary Pattern	Secondary Pattern	Exposures						
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
Exposures	#	Label (ETC Run)	Target	Config, Mode, Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	(2)	Pattern Type=STIS-ALONG-SLIT Coordinate Frame=POS-TARG Purpose=DITHER Pattern Orientation=90.0 Number Of Points=3 Angle Between Sides= Point Spacing=0.3829 Center Pattern=false Line Spacing=			(2), (3)					
	(1)	ASASSN-14KO	RA: 05 25 18.1170 (81.3254875d) Dec: -46 00 20.23 (-46.00562d) Equinox: J2000	Epoch of Position: 2015.5 Redshift: 0.042489	V=14.5+/-0.2 at peak: W1=15.69(0.04), M2=15.66(0.07), and W2=15.64(0.04)	Reference Frame: ICRS				
	1	(STIS.ta.147 2418)	(1) ASASSN-14KO	STIS/CCD, ACQ, 50CCD	MIRROR			5 Secs (5 Secs)	[1]	
	2	(STIS.sp.82 6569)	(1) ASASSN-14KO	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A		Pattern 2, Exps 2-2 in Epoch 2 (Rise) (02) (2)	200 Secs X 2 (1010 Secs) [==>168.0 Secs (Pattern 1, Copy 1)] [==>168.0 Secs (Pattern 1, Copy 2)] [==>168.0 Secs (Pattern 2, Copy 1)] [==>168.0 Secs (Pattern 2, Copy 2)] [==>169.0 Secs (Pattern 3, Copy 1)] [==>169.0 Secs (Pattern 3, Copy 2)]	[1]	
	3	(STIS.sp.82 6568)	(1) ASASSN-14KO	STIS/FUV-MAMA, ACCUM, 52X0.2	G140L 1425 A		Pattern 2, Exps 3-3 in Epoch 2 (Rise) (02) (2)	500 Secs X 2 (2835 Secs) [==>422.0 Secs (Pattern 1, Copy 1)] [==>460.0 Secs (Pattern 1, Copy 2)] [==>460.0 Secs (Pattern 2, Copy 1)] [==>460.0 Secs (Pattern 2, Copy 2)] [==>460.0 Secs (Pattern 3, Copy 1)] [==>573.0 Secs (Pattern 3, Copy 2)]	[2]	

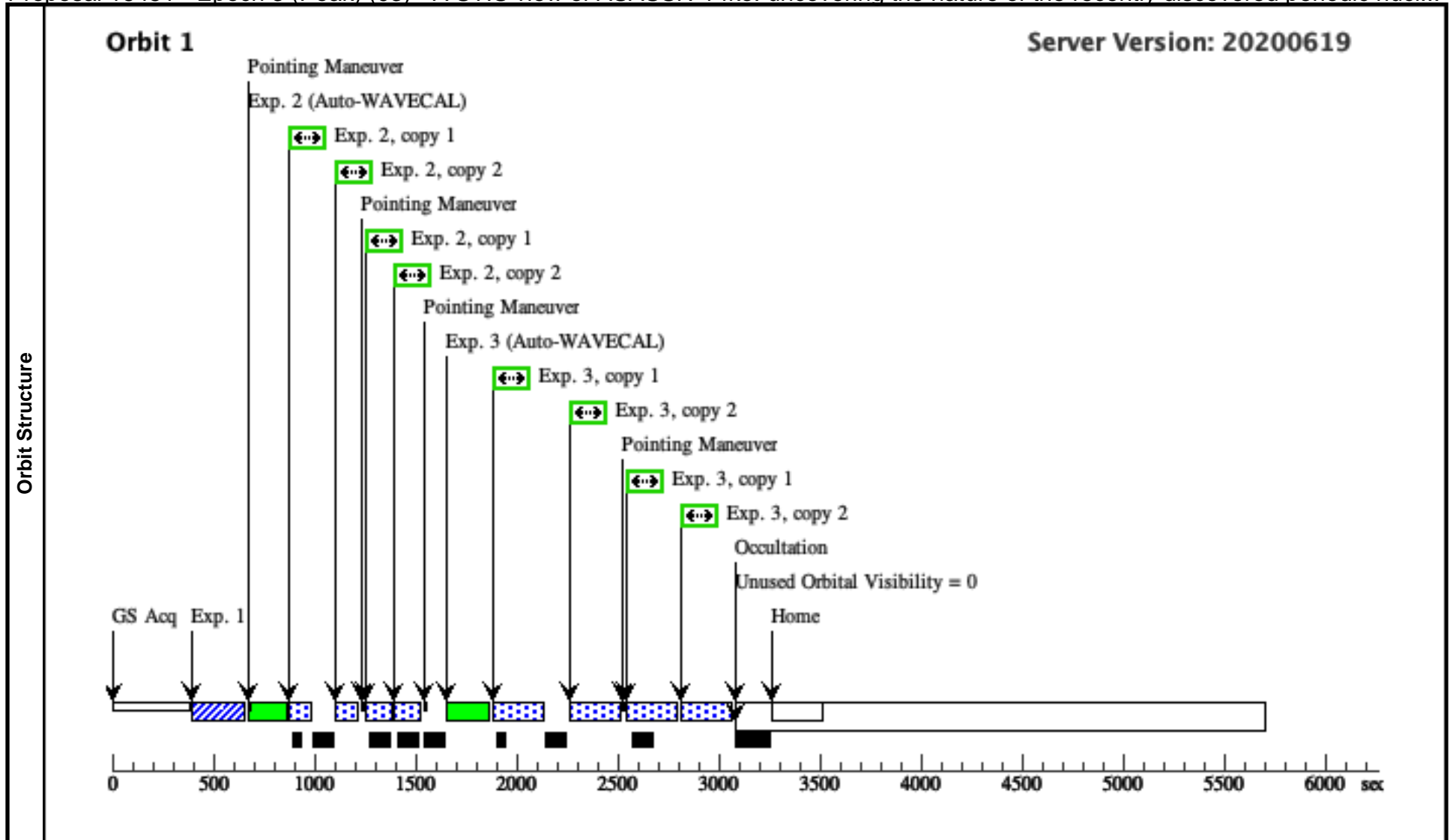




Proposal 16451 - Epoch 3 (Peak) (03) - A STIS view of ASASSN-14ko: uncovering the nature of the recently discovered periodic nucl...

Thu Dec 17 21:00:22 GMT 2020

Visit	Proposal 16451, Epoch 3 (Peak) (03), scheduled Diagnostic Status: No Diagnostics Scientific Instruments: STIS/NUV-MAMA, STIS/CCD, STIS/FUV-MAMA Special Requirements: SCHED 70%; BETWEEN 21-DEC-2020:00:00:00 AND 23-DEC-2020:00:00:00 Comments: <i>Peak of the ASASSN-14ko Dec 2020 outburst</i>									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(1)	Pattern Type=STIS-ALONG-SLIT Coordinate Frame=POS-TARG Purpose=DITHER Pattern Orientation=90.0 Number Of Points=2 Angle Between Sides= Point Spacing=0.3829 Center Pattern=false Line Spacing=		(2), (3)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	ASASSN-14KO	RA: 05 25 18.1170 (81.3254875d) Dec: -46 00 20.23 (-46.00562d) Equinox: J2000	Epoch of Position: 2015.5 Redshift: 0.042489	V=14.5+/-0.2 at peak: W1=15.69(0.04), M2=15.66(0.07), and W2=15.64(0.04)	Reference Frame: ICRS				
Comments: <i>Note, this is the nucleus of a galaxy, but, it is a complex galaxy. Please see submission notes.</i> Category=GALAXY Description=[ACCRETION DISK, MULTIPLE NUCLEI, NUCLEUS, QUASAR]										
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(STIS.ta.147 2418)	(1) ASASSN-14KO	STIS/CCD, ACQ, 50CCD	MIRROR				5 Secs (5 Secs)	
									[==>]	[1]
	2	(STIS.sp.14 72500)	(1) ASASSN-14KO	STIS/FUV-MAMA, ACCUM, 52X0.2	G140L 1425 A			Pattern 1, Exps 2-2 in Epoch 3 (Peak) (03) (1)	100 Secs X 2 (440 Secs) [==>100.0 Secs (Pattern 1, Copy 1)] [==>100.0 Secs (Pattern 1, Copy 2)] [==>120.0 Secs (Pattern 2, Copy 1)] [==>120.0 Secs (Pattern 2, Copy 2)]	[1]
3	(STIS.sp.14 72498)	(1) ASASSN-14KO	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A			Pattern 1, Exps 3-3 in Epoch 3 (Peak) (03) (1)	100 Secs X 2 (965 Secs) [==>241.0 Secs (Pattern 1, Copy 1)] [==>241.0 Secs (Pattern 1, Copy 2)] [==>241.0 Secs (Pattern 2, Copy 1)] [==>242.0 Secs (Pattern 2, Copy 2)]	[1]	



Proposal 16451 - Epoch 4 (Decline) (04) - A STIS view of ASASSN-14ko: uncovering the nature of the recently discovered periodic nu...

Thu Dec 17 21:00:22 GMT 2020

Visit	Proposal 16451, Epoch 4 (Decline) (04), scheduling Diagnostic Status: No Diagnostics Scientific Instruments: STIS/NUV-MAMA, STIS/CCD, STIS/FUV-MAMA Special Requirements: BETWEEN 28-DEC-2020:00:00:00 AND 03-JAN-2021:00:00:00 Comments: Decline of the ASASSN-14ko Dec 2020 outburst									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(2)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG						(2), (3)
		Purpose=DITHER	Pattern Orientation=90.0							
		Number Of Points=3	Angle Between Sides=							
		Point Spacing=0.3829	Center Pattern=false							
		Line Spacing=								
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	ASASSN-14KO	RA: 05 25 18.1170 (81.3254875d) Dec: -46 00 20.23 (-46.00562d) Equinox: J2000	Epoch of Position: 2015.5 Redshift: 0.042489	V=14.5+/-0.2 at peak: W1=15.69(0.04), M2=15.66(0.07), and W2=15.64(0.04)	Reference Frame: ICRS				
	Comments: Note, this is the nucleus of a galaxy, but, it is a complex galaxy. Please see submission notes. Category=GALAXY Description=[ACCRETION DISK, MULTIPLE NUCLEI, NUCLEUS, QUASAR]									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(STIS.ta.147 2418)	(1) ASASSN-14KO	STIS/CCD, ACQ, 50CCD	MIRROR				5 Secs (5 Secs)	
								[==>]	[1]	
	2	(STIS.sp.82 6569)	(1) ASASSN-14KO	STIS/NUV-MAMA, ACCUM, 52X0.2	G230L 2376 A			Pattern 2, Exps 2-2 in Epoch 4 (Decline) (04) (2)	300 Secs X 2 (1242 Secs)	
								[==>207.0 Secs (Pattern 1, Copy 1)]		[1]
								[==>207.0 Secs (Pattern 1, Copy 2)]		
								[==>207.0 Secs (Pattern 2, Copy 1)]		
								[==>207.0 Secs (Pattern 2, Copy 2)]		
								[==>207.0 Secs (Pattern 3, Copy 1)]		
								[==>207.0 Secs (Pattern 3, Copy 2)]		
	3	(STIS.sp.82 6568)	(1) ASASSN-14KO	STIS/FUV-MAMA, ACCUM, 52X0.2	G140L 1425 A			Pattern 2, Exps 3-3 in Epoch 4 (Decline) (04) (2)	300 Secs X 2 (3004 Secs)	
								[==>502 Secs (Pattern 1, Copy 1)]	[1]	
								[==>500 Secs (Pattern 1, Copy 2)]		[2]
								[==>500 Secs (Pattern 2, Copy 1)]		
								[==>500 Secs (Pattern 2, Copy 2)]		
								[==>500 Secs (Pattern 3, Copy 1)]		
								[==>502.0 Secs (Pattern 3, Copy 2)]		

